Chemical Age

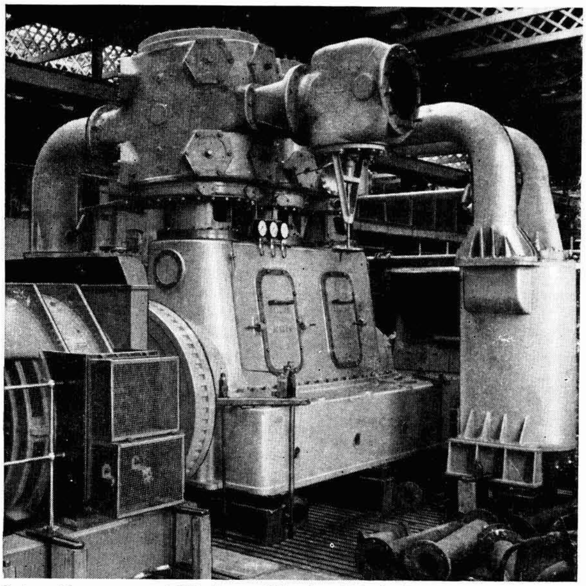
Prospects for British Chemical Exports

(page 711)

VOL. 84 No. 2155

29 October 1960

THE WEEKLY NEWSPAPER OF THE CHEMICAL INDUSTRY



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INDEX TO ADVERTISERS

The first figures refer to advertisements in **Chemical Age Directory & Who's Who,** *the second to the current issue*

(*Continued on page 692*)

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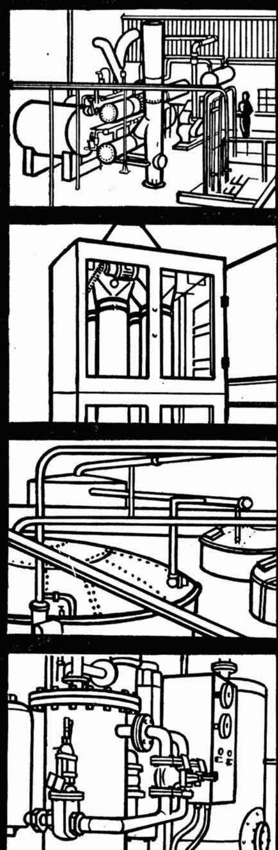

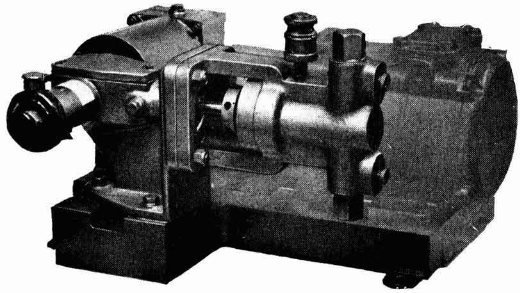

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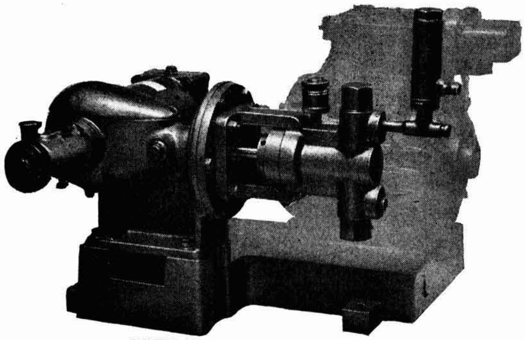

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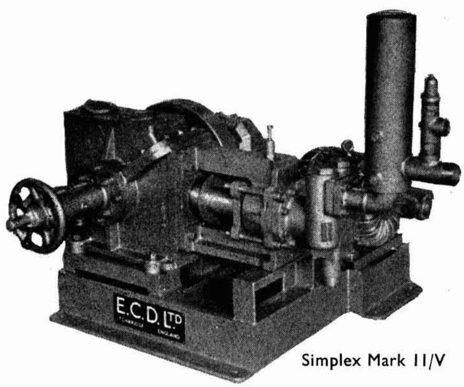

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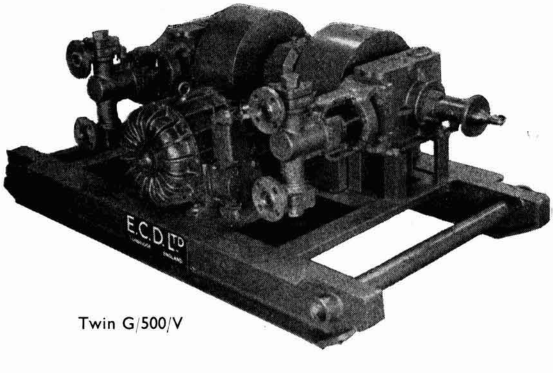

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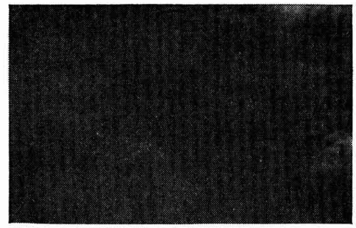

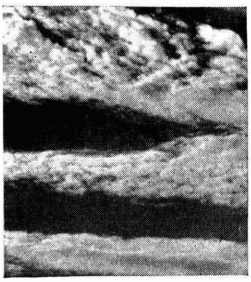


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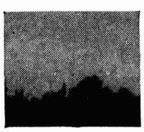
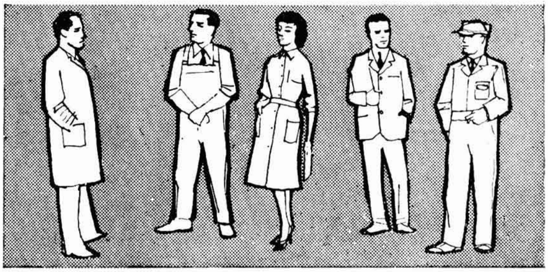


for industry



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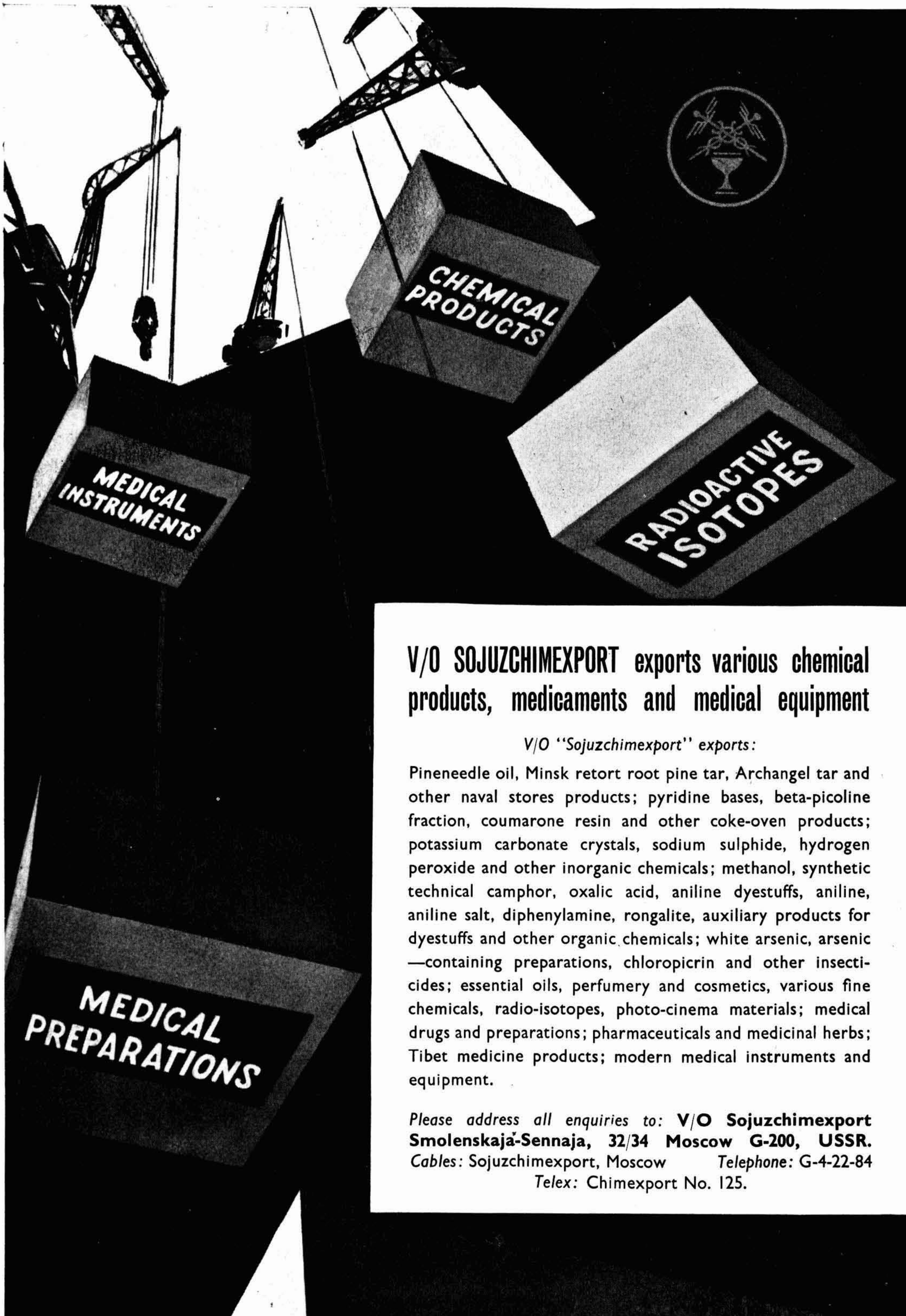
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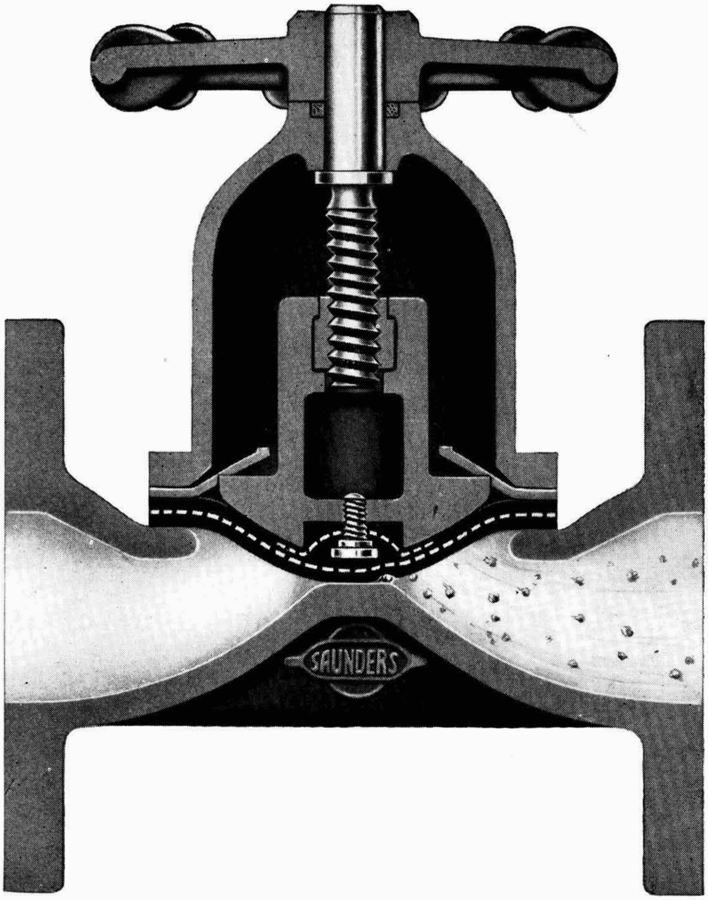
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OCTOBER 29 1960

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IN THIS ISSUE

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CHEMICAL AGE

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CHEMICAL EXPORTS

BRITAIN'S chemical producers can well be proud of their export achievements, but that they are far from complacent about the future is obvious from the special contributions made by leaders in the industry to this special issue of CHEMICAL AGE. It has been clear for some time that while U.K. chemical exports have continued to increase, they have not done so at the same rate as exports of some other countries, notably West Germany and the U.S.

In the first six months of this year, U.K. shipments of chemicals were 12.4% up on the same period of 1959 and it seemed certain that the 1960 total would well exceed £300 million for the first time. In the period June to August, the monthly rate showed a 6% rise over the 1959 monthly average. Since then the prolonged dock strike has clouded the picture.

Increasing competition is making it much more difficult to sell overseas and it is obvious that the chemical industries of the European Economic Community are making an all-out bid for overseas markets. The U.S. industry,, with its extremely large-scale production units, is especially well placed to make serious inroads in export spheres, particularly when domestic demand falls off.

There is no doubt that export business is being lost to the smaller U.K. chemical companies because they cannot compete with the credit terms offered by some other countries. That is why the extension of the export credits guarantee scheme to allow a U.K. exporter to match terms offered by a foreign competitor is most welcome.

Also welcome is the formation of the Export Council for Europe. Just how this will help industry is not yet clear for the terms of reference were not known as we went to press.

The setting-up of chemical factories in the less industrialised countries is having an effect on our Commonwealth trade, for it usually leads to the imposition of tariffs to protect the new industry. But this is a short-term setback; the past few decades have shown that chemical imports rise as a country builds up a chemical industry. The highly industrialised areas of the world have always been among the best customers of the U.K. chemical industry.

The most urgent problem concerns trade with Europe and the continued existence of two separate trading blocs. One of the most encouraging signs is the willing manner in which the chemical industries of West Europe are tackling the problem. As Sir William Garrett points out in page 712, a sector-by-sector study is now being made to establish the effects on the different industries of a free market in Europe.

As far as exports are concerned the British chemical industry is in a period of transition that is likely to continue for some time. Two forward paths are possible. One points in the direction of a continued split in European trade, and in the long term that would materially injure the British industry; the other leads to the only satisfactory way ahead—a merger of the two trading communities. It is only by being able to operate in a vast free trade area in Europe that the U.K. chemical industry can maintain and increase its present growth rate

DISTILLATES

★ STRIKING contrasts in plant design make an immediate impact on visitors to the Carrington site of Shell Chemical as do the vast expansion projects either completed or in hand. The older units built before Shell's acquisition of Petrochemicals Ltd., with their closely packed columns and vessels, need the services of a contortionist rather than a maintenance engineer. Now being revamped are the 'cold boxes' of the first ethylene fractionation unit—maintenance here was costly time-consuming and called for inspired guesswork to locate leaks or other faults.

Since 1955 Shell have spent something like £25 million at Carrington, and plan to spend a similar sum. Their plants are spacious, with plenty of room for maintenance—and, I suspect, further expansion. The new Ethylene II plant, Kellogg's first U.K. unit for Shell, which has just come on stream, is a case in point.

The first Shell ethylene unit—the Catarole cracker—uses the original Petrocarbon process (but modified by Shell to replace catalytic by thermal cracking) and two days before flying to Carrington I met Dr. Helmut Pobloth of Leuna Werke, East Germany, who plan to use the Petrocarbon technique, with design and engineering by Humphreys and Glasgow Ltd. of London (see p. 727).

★ A NORWEGIAN reader gently chides me for implying (1 October) that *aquavit*, as Scandinavia's *favourite* drink, can be based on alcohol produced from sulphite liquor. He promises to bring me a bottle of the real McCoy, which, as he points out, is based on alcohol derived from potatoes. In the face of this promise, I readily concede his point and will gladly take my medicine! It is true of course that, while some *aquavit* has been produced from sulphite liquor, *aquavit's* position at the top of the popularity poll so far rests on the potato-based product. My previous note was intended merely to draw attention to the possibilities of wood hydrolysis, on which an important F.A.O. meeting was held at Tokyo earlier this month.

While on the subject of both food products and Tokyo, it is worth warning readers who may be headed that way that they may find Japanese people much more touchy on the subject of whales than Scandinavians are about *aquavit*. For in Tokyo tinned food, labelled as stewed beef, has recently been analysed as whale, while other processed meats have been found to include kangaroo.

The Tokyo Sanitation Bureau, investigating a complaint, found a company in Yokohama turning out cans of meat bearing another company's trade mark on the label and the contents of the can bore no resemblance to the description on the label. The company whose label was copied were asked to take action, but when no further word was heard, the Sanitation Bureau investigated and found that the bigger company were also using whale meat in their cans of stewed beef.

A public outcry has resulted in tinned meat now being unsaleable in Japan, except for the products of genuine whale canners who are making the most of the situation by proclaiming that even the meat canners cannot do without the wholesome, nourishing whale. Can we expect a very substantial delegation from Japan to the next Pure Food Conference?

★ THE fact that the Soviet Union's chemical output in the first half of 1960 was only 11% above that for the corresponding period of 1959, and fell short of the planned increase of 18%, is, of course, partly why the U.S.S.R. is keen to buy both know-how and complete chemical plants in the West. Chemical output in Soviet Russia over the first two years of the current seven-year plan is now expected to rise by only 22-24%, against the hoped for increase of 39%.

One of the reasons for this short-fall of the chemical target is, of course, due to lack of facilities for the fabrication of highly specialised chemical plant and equipment. Also lacking is the technical experience of designing and operating certain types of plant, particularly in the polyolefin and synthetic fibre fields.

This week, on page 717, Mr. A. Wormald, a managing director of Fisons Ltd., who has travelled widely in Eastern Europe, writes on various aspects of trade with the Soviet Union. Needless to say, his thinking runs on different lines from that of General John Hull, whose views were published last week.

★ WHAT a pity that the architectural splendours of the new office and laboratory buildings of Ashburton Chemical should be 'lost' among the smoke and grime of Trafford Park. The buildings, which I visited two months before their official opening by the President of the Board of Trade (C.A., last week, p. 669) deserve a much finer setting; aesthetically they outshine most of the monster office blocks in Manchester city centre.

The five-storey administrative wing is raised over a *porte cochère* and on the south side this gives a view over the garden. Distinctive appearance of the building is partly due to timber-framed curtain walling which is glazed with spandril panels of Vitroslab. These allow easy cleaning in view of Trafford Park's smog, which is also responsible for the fact that not one of the hundreds of windows can be opened. Air filtered by electrostatic precipitation, is changed four times an hour in the offices, eight times in some laboratories.

A symbolic mural by Jo Mayo on one wall of the *porte cochère* has as its themes, the Geigy tradition in medicine, Geigy products and the evolution of the industries they serve. Full marks to architects Scherrer and Hicks for the imaginative way they handled the buildings and to Geigy for allowing them a free hand.

★ EVER since Adam and Eve clothed themselves in fig leaves, ways have been sought of producing fabrics without going to the trouble of weaving fibres, and more than one textile chemist has taken a long, hard look at the way in which paper is produced from pulp, to see if other fabrics might be produced by some similar method.

Latest idea is that of Du Pont de Nemours International S.A., Geneva offshoot of the American concern, who announce a new process for producing fabrics on paper-making equipment, using synthetic fibrous particles developed by Du Pont. It is stated that the new non-woven structures, dubbed 'textryls', may be produced in a variety of weights and textures, and are usable in applications currently employing either paper or certain types of textiles. They can be printed, dyed and embossed, and fabrication techniques used in the clothing trade may be applied to some of them.

Du Pont will produce and sell 'fibrids' —as they call the new fibrous forms of synthetic polymeric materials—only in experimental quantities for the present. Prices of these materials are not disclosed.

★ WILL 'Wibbling' become the new craze in the U.S.? Monsanto Chemical Co. of St. Louis are hoping that the Wibbler will do for high-impact polystyrene what the hula-hoop did for polythene. What is a Wibbler? Well, the Wibbler looks like a miniature arched bridge with a step on each end to stand on—if you can. The idea is to balance on the Wibbler and then walk, run or dance. For this 1960 version of the old-fashioned teeter board, Monsanto are supplying their Lustrex high-impact polystyrene.

For those interested, the Wibbler is made by the Wibbler Co. of St. Louis and the new balancing toy is now on sale in most U.S. leading department and chain stores—price $1.98 (about 12s).

Alembic

Simon-Carves and International Combustion Pool Technical Resources

A POOLING of technical resources which is expected to result in greater overall efficiency in operation and in wider fields of application has been announced jointly by Simon-Carves Ltd. and International Combustion (Holdings) Ltd.

Inter-company trading has already been established to a substantial extent since the two companies have been closely connected in the technical field for a number of years, and their interests have been complementary in many other industries.

The merger is essentially one of technical resources and it is not intended that there should be any merging of capital or financial resources. The identity of both organisations will be preserved, and no alteration in existing commitments is envisaged.

Glaxo Deny Rumours of Bid for B.D.H.

RUMOURS published on Tuesday to the effect that Glaxo Laboratories were involved with merger talks with British Drug Houses Ltd. were denied by Glaxo the same day. On Tuesday the shares of B.D.H. were active and closed with a rise of 2s 6d at 23s 9d on suggestions that an announcement of a merger with Glaxo might soon be made. Glaxo lost 1s 6d to 83s.

Mr. Geoffrey Eley, chairman of B.D.H. recently stated that the directors had been in the preliminary stages of exploring the possibility of a merger with another company, but that no offer had been made and that the discussions might well come to nothing.

Statement Expected on Howards Merger Talks

Mr. T. W. Howard, the chairman of Howards and Sons, who are also engaged in merger talks with an unnamed company, has said that he hopes to make an announcement by the end of the month. Early in August, it was stated that an approach had been made which might result in a cash offer.

U.K. Chemical Plant Spending is at 1955 Levels

CAPITAL expenditure in the chemicals and allied industries during the second quarter of 1960 totalled £33.6 million, lower than the first quarter figure by £700,000 and the lowest second-quarter figure since 1955. The following is an extract from the Board of Trade statistics:

Year	*1st Qtr.*	*2nd Qtr.*	*3rd Qtr.*	*4th Qtr.*	*Total*
1954	—	—	—	—	112·1
1955	22·9	25·8	28·7	38·8	116·2
1956	34·9	36·5	40·6	49·3	161·3
1957	45·4	48·0	47·7	54·5	195·6
1958	50·7	50·5	48·3	55·5	205·0
1959	41·5	39·9	31·6	40·4	153·4
1960	34·3	33·6			

Project News

Major Wilton Projects Hinted at by Site Chairman

WHILE there are no major new projects for **I.C.I. Wilton Works** that have reached the stage of sanction, a long-term forward review of manufacturing plans indicates the probability of various extensions and additions. These are of such magnitude that examination is now being made of the form which future extensions to services at Wilton, particularly steam and electricity supplies, should take. This was stated by Mr. J. C. H. McEntee, chairman of the Wilton Council, recently. Arrangements for water supplies will cater for substantial future increases in demand.

Mr. McEntee added that expansion work on the Terylene III plant was proceeding apace and that the same was true of the major extension to the nylon plant, known as Nylon IV.

Early stages of construction at Severnside are proceeding satisfactorily—work on roads, drains and the first steelwork for workshops. Already for Severnside there is a programme ahead of rather more than £15 million.

Shell's Ethylene 2 Unit on Stream at Carrington

● SECOND ethylene unit of the **Shell Chemical Co.** at Carrington has recently come on stream. With a design capacity of 55,000 tons a year of ethylene from straight run naphtha, it was built by the **Kellogg International Corporation,** London, who supplied complete services, covering all aspects of process design, engineering, procurement and construction. Kellogg also supplied a commissioning team. (For further details see page 725.)

Construction of Gas Reform Plant in Netherlands Advances

● GOOD progress is being made on the **Chemico** gas reform plant under construction for Mekog at Ijmuiden in the Netherlands. On this plant good use has been made of the Dutch waterways, the site location beside the North Sea Canal providing easy access for some of the major equipment which has been floated to the plant limits or transported by barge. Heavy road transport has also played its part and some equipment has arrived on site by rail.

Carbon Black Plant for I.C.I. Billingham

● A CARBON BLACK plant is to be installed in the gas and power works section of I.C.I. Billingham Division as soon as the practical process details have been settled. The Billingham oil gasification plant produces a mixture of water and solid carbon as a by-product of combustion. This is currently taken away in special lorries for dumping, but the division's research department has now found a fairly simple way of converting it into saleable carbon black.

The oil gasification plant has switched from combustion with air to combustion with oxygen piped under the Tees from the British Oxygen Co.'s Lackenby plant; the division's own oxygen plant is to be rebuilt.

Blaw-Knox Have Contract for Synthetic Rubber

● **Blaw-Knox Chemical Engineering Co. Ltd.,** of 20 Eastbourne Terrace, London W.2, have under construction in Europe a synthetic rubber plant. Their contract covers complete construction. No details as to name of client, site or size of plant are available.

Comprimo Handle Pernis Polypropylene Plant

● **Comprimo,** the Dutch contracting company, are handling construction of the polypropylene plant that the Royal Dutch/Shell Group are constructing at Pernis, Holland, under Montecatini licence.

Colvilles Limestone Contract

● A CONTRACT valued at some £300,000 has been awarded to **Keir and Cawder (Engineering),** mechanical handling and structural engineers, of Bishopbriggs, Glasgow, for the supply and installation of a limestone crushing, screening, conveying and loading plant for Colvilles, of Glasgow.

The plant will be one of the largest of its kind in the country with an ultimate production of 400 tons/hr.

Chemico Gas Scrubber

● A CONTRACT has been awarded by Glass Bulbs Ltd. to **Chemical Construction (G.B.) Ltd.** to supply a Pease-Anthony venturi and cyclonic gas scrubber, to handle 6,000 c.f.m. saturated gas containing hydrofluoric acid fumes. The installation will be at their Harworth works, near Doncaster.

Foster Wheeler Get Contract for Second Nuclear Submarine

● A CONTRACT has been placed with **Foster-Wheeler** for work on the second British nuclear submarine. The exact nature of the work is not disclosed.

S.C.I. Memorial Lecture

Due to a family bereavement, Mr. George Brearley, director of the Association of British Chemical Manufacturers, was unable to give the Jubilee Memorial Lecture of the Yorkshire Section, Society of Chemical Industry, planned for 24 October. It is hoped to arrange the lecture at a future date.

Computer-controlled Chemical Plant for B.A.S.F.

As reported in Chemical Age, 15 October, p. 631, Badische Anilin- und Soda-Fabrik AG have plans for a completely automatic chemical plant using equipment ordered from the U.S. firm of Thompson Ramo Wooldridge. It is now revealed that the equipment concerned is an RW-300 digital control computer, which will be installed this year in the B.A.S.F. plant at Lugwigshafen am Rhein. It is believed that this will be the first closed-loop computer control system to be installed outside the U.S. Engineers of TRW Computers Co., a division of Thompson Ramo Wooldridge, have been working with B.A.S.F. technical personnel for some 10 months, analysing the process and developing the control system.

The computer will control the process by reading instruments in the plant, by performing computations based on the information received and on the 'mathematical model' stored in the computer's 8,000-word memory unit, and by then automatically adjusting the plant controls to achieve optimum operation. The complete RW-300 system includes the desk-size computer, an operator's console, an automatic imput-output typewriter, and an automatic data-logging typewriter.

The RW-300 is a transistorised digital computer incorporating built-in analogue-to-digital conversion equipment, a magnetic drum memory unit, modular construction for ease of maintenance, and other features. System engineering, programming, check-out, and installation are being performed by TRW Computers engineers.

Thompson Ramo Wooldridge Inc. and two leading French electronic firms, Compagnie générale de télégraphie Sans Fil (CSF) and Intertechnique, recently formed a subsidiary, Compagnie Europeenne D'Automatisme Electronique, to manufacture and market RW-300 computer systems in the European Common Market.

Stockdale Link with U.S. Mixco to Form Joint Industrial Mixer Firm

A new company to be known as Lightnin Mixers Ltd., has been formed by Stockdale Engineering Ltd., Poynton, Ches, and the Mixing Equipment Co. Inc. (Mixco), Rochester, New York. The new company has taken over the range of standard U.K. mixers, and will also market the complete line of Lightnin industrial mixers. The integrated range of fluid mixers now available will, it is said, represent the most comprehensive range of its kind.

The announcement was jointly made by Mr. William Stockdale, chairman of the new company, and Mr. F. H. Gordon, president of Mixco. The products of the new company will be manufactured at the modern Stockdale works at Poynton which, Mr. Stockdale said, "is at present being doubled in floor area to meet the required demands of the joint company." Additional extensions are in the planning stage.

Mixco customers will be serviced on a more direct basis than previously possible, and the new company will have at its disposal the extensive know-how accumulated by Mixco as the world's largest manufacturers of fluid mixing equipment. Representation and service facilities will be available throughout the Common Market, the Outer Seven, Africa and East as far as India and Pakistan.

Farmers Took Record 400,000 Tons of Nitrogen Fertilisers in 1959-60

Since the spring almost all plants of I.C.I. Billingham Division have been meeting the highest output that could be obtained. Final nitrogen fertiliser deliveries for 1959-60 exceeded the division's highest forecast. This was stated by Mr. W. J. V. Ward, division cahirman, at a recent meeting of the division council, who added that in the plants making ammonia, methanol and hydrogen, every compressor that had been capable of running had been run.

For the first time deliveries of nitrogen fertiliser from all sources, including I.C.I.'s competitors and imports, exceeded the equivalent of 400,000 tons of nitrogen. There were record deliveries for C.C.F. and Nitro-chalk, with increases in sales of Kaynitro. Mr. Ward described prospects for 1960-61 as reasonable.

Although Board of Trade action had stopped dumping from the Continent, of ammonium sulphate, other imports of different nitrogenous fertilisers still continued and it was difficult to take action against them.

Burned by Molten Tar

After an accident at the premises of Yorkshire Tar Distillers Ltd., Cleckheaton, on 21 October, Robert Rawlins, aged 44, was taken to hospital at Batley with severe burns to face and neck caused by molten tar.

Billingham Modernisation Scheme Will Keep I.C.I. Engineers Busy

Work on the modernisation of I.C.I.'s Billingham works will begin soon, according to an announcement by Dr. A. M. McKay, the works' chief engineer, when he presented long-service awards to employees recently. He pointed out that the Billingham works were getting old by chemical industry standards and, unless brought up to date, would not be able to compete successfully in home and overseas markets.

Dr. Kay said that the modernisation work would lagely fill up the order books of the company's engineering works, for which work has not always been so readily available during the past 18 months or so. Redundancy had occurred amongst the 3,000 employees, though not to a serious extent, and the proposed modernisation is expected to alleviate the problem.

Planned Maintenance Saves Laporte £3,000 A Year

Planned maintenance is saving Laporte Titanium Ltd. over £3,000 per year in costs and five working days in time on the overhaul of the pyrites roasting contact plant which produces sulphuric acid for use in titanium oxide. Before the introduction of planned maintenance, the routine was for a direct inspection to reveal what was necessary, followed by the sending of men from up to 11 different trades to do the work. Planned maintenance was introduced to programme the separate operations into an ordered sequence.

The plant manager and engineers supplied technical details which were plotted on a chart, giving jobs and times allowed. Once details were agreed a written programme was issued to all foremen so that they knew precisely on which day they were expected to start work, what they were supposed to do and how long it was scheduled to take.

In three years the shut-down has been reduced from 23½ days to 18½ days with a £3,000 saving because of drop in lost production time. Moreover, the maintenance strength needed over this period has fallen by 20%.

British Coke Experts Visit Poland

A delegation of senior officials of the coking industry in the U.K. is visiting research institutions and coke oven plants in Poland. The party is led by Mr. G. W. Lee, director of the British Coke Research Association and includes Mr. D. E. Baird, director of the British Coking Industry Association, Dr. R. J. Morley, director-general of carbonisation, N.C.B., and Mr. W. J. Pater of the British Coke Research Association.

The tour, which lasts 12 days, is being made at the invitation of the Iron and Steel Board of Poland and is a reciprocal arrangement following the visit of Polish carbonisation officials to the U.K. in December 1959.

CHEMICAL AGE OVERSEAS EDITION

MESSAGE FROM

The Rt. Hon. Reginald Maudling,

President, Board of Trade

From the President

BOARD OF TRADE,
HORSE GUARDS AVENUE,
WHITEHALL, S.W.1.

I am very glad to have this opportunity of addressing a message to the British Chemical Industry on the subject of exports and international trade.

I feel I need hardly emphasise to you the vital role that exports play in this country's economy; indeed, your industry, ranking as the third largest exporter, well deserves congratulations on its performance over recent years.

I have every confidence in your ability to maintain - and indeed to improve - your position as a major world supplier of chemicals. By so doing you will be making a material contribution to the prosperity of the country.

PROSPECTS FOR BRITISH CHEMICAL EXPORTS—
By the Chairman, A.B.C.M.

Overseas Trade Problems Reviewed by Sir William Garrett

IT is my task in this special issue to review briefly the progress of the chemical industry in the export field and to high-light any significant factors which may influence our trade in the near future. For some years past the exports of chemicals have risen steadily, reaching £293 million in 1959—a figure somewhat higher than was forecast and resulting from appreciable increases during the latter half of the year. For 1960 to date this rate of expansion has so far been maintained and the figures for the first eight months, amounting to £210 m., are £10 m. higher than for the same period last year. The effects of the recent dock strike are difficult to forecast but it is hoped that despite this unfortunate handicap the total exports for 1960 will exceed £300 million.

At present U.K. exports of chemicals account for 10.3% of the value of exports of all manufactured goods; while this proportion is impressive and slightly higher than in previous years, there should be no complacency since the U.K. share in world trade is diminishing and our share of the world chemical markets has also fallen. Nevertheless the chemical industry has reason to be proud of its record and the large scale capital investments in recent years, amounting to £1,340 m. since 1948, demonstrate our intention to play an even greater part in the nation's trade.

A considerable proportion of this investment has and will in future be for the production of petroleum chemicals, a substantial proportion of which will find outlets as plastics and man-made fibres, both of which today rank as industries in their own right. It must not be forgotten that the spectacular rise in exports of plastics and resins is based upon these investments.

Changes in Trade with Commonwealth

While the Commonwealth remains our major market, trading opportunities there will undoubtedly be affected by the legitimate desire on the part of Commonwealth countries to establish their own viable chemical industries and to seek protection for them.

Thus the Canadian chemical industry has recently applied for protection over a very wide field and the Tariff Board has begun detailed examination of the industry's claims. This trend is also evident in Australia, India and South Africa, in all of which countries British chemical manufacturers are investing considerable sums.

Trade with the U.S.A. and the dollar area generally has been maintained in spite of the well-known difficulties associated with tariffs and our geographical position. The European market rightly claims our immediate attention. It is too early to assess the effects upon U.K. exports of the establishment of the E.F.T.A., but the chemical industry can be relied upon to do all it can to take advantage of the preferential area which is being created. However, one cannot overlook the fact that for many chemicals duties are low or non-existent and thus the preferential margins, even in a fully mature E.F.T.A., may not be of great value to us. In spite of this, the chemical industry is determined to improve its export performance to the Association countries to which exports during the first eight months of 1960 amounted to £20 m., a slight increase on the previous year.

SIR WILLIAM GARRETT, Chairman, Association of British Chemical Manufacturers

Overshadowing these considerations are the effects of the continued division of Europe into two trading areas. This division has not yet proved a serious handicap to our exports since the differences in the duty in the European Economic Community upon E.E.C. products and the corresponding products of other countries have so far been relatively small. This situation will change significantly in 1961 when E.E.C. countries will begin their moves towards the common tariff. In the Benelux countries in particular, duties will be raised against exports from non-members, while generally remaining duty free to members of the community. For the chemical industry, therefore, this is an urgent problem, particularly as the markets of E.E.C. are substantially greater than those of E.F.T.A., amounting in 1959 to £46 m. and promising to reach £55 m. this year.

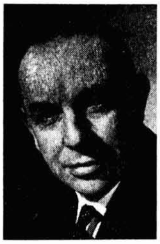
Frequent and Detailed Discussions

It is for this reason and because of our earnest desire for a truly European solution that the chemical associations of Western Europe have, for some years, collaborated closely in attempts to produce a solution acceptable to all. Frequent and detailed discussion have taken place between the presidents and directors of the members of Centre Européen des Fédérations de l'Industrie Chimique and at the latest of these meetings held in Berlin earlier this month a further exchange of views took place on this vital problem. The measure of goodwill and common ground already existing has encouraged the associations to collaborate even more closely in their attempts to find a common solution. As a result detailed studies are already under way on certain fundamental questions and definitions. In addition, examinations are being carried out in the major sectors of the chemical industry to establish the effects upon them of a free market in Western Europe.

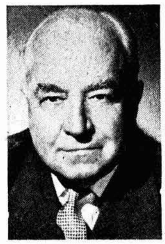
It is felt that a sector by sector approach provides the best means of arriving at a solution for the European chemical industries. It is perhaps a good augury that these painstaking studies are being willingly undertaken in all the countries affected and it encourages the hope that the desired objective of a free market in Europe will be achieved.

PROSPECTS FOR BRITISH CHEMICAL EXPORTS—

By Leaders of the Industry



S. P. CHAMBERS, Chairman, Imperial Chemical Industries Ltd.



SIR MILES THOMAS, Chairman, Monsanto Chemicals Ltd.

1960 Should See Record Exports for I.C.I.

I.C.I.'s exports in 1959 were an all time record and the upward trend is continuing so that 1960 should show a substantial increase over 1959.

Good progress has been made in sales to the 'Outer Seven' (E.F.T.A.) and the 'Inner Six' (the Common Market) as well as to Soviet Russia and other countries of the Eastern bloc. In all these areas exports in 1960 should exceed those of 1959.

In the sterling area markets where many of the company's products have been established for many years progress is slower but as internal problems and balance of payments difficulties are overcome in those countries the upward trend can be expected to be resumed. Elsewhere progress has been uneven; there are political difficulties in the Middle East and currency difficulties continue to impede trade with South America and the Far East.

In all markets there is strong competition and sales can be achieved only if our products are competitive both in quality and in price.

As was expected, the rate of growth of exports is greater with the newer chemicals, such as plastics, synthetic fibres, and a number of products in the petrochemicals field. Exports in heavier chemicals and industrial explosives are not likely to increase in any spectacular manner and some business is bound to be lost as more countries such as India set up or expand their own industry. One heartening feature, however, is that as industrialisation proceeds the demand for chemicals increases.

It is a characteristic of most of our products that they are the materials for other industries and there are opportunities, therefore, in all countries where there is an upsurge of economic activity, particularly in Western Europe, for the sale of I.C.I. products used by the growing secondary and fabricating industries concerned. For this reason our sales to British industry are some index of the state of British industry just as our exports are in some instances a reflection of the industrial activity in the markets which we serve. At the present time sales, both at home and overseas, are running at high levels but if sales in Britain were to become static or even decline while our exports expanded, this might appear to be a good thing for Britain's balance of payments but might indicate a recession in British industry. At present there are no signs of this but we would regard a more than proportional increase in exports as disquieting.

S. P. CHAMBERS,
Chairman,
Imperial Chemical Industries Ltd.

Monsanto Look to Chemical Stocks on the Continent

THE progressive industrialisation which has taken place in many countries over the last decade can be expected to continue during the next few years. This will create a growing demand for chemicals as manufacturing raw materials. Although side by side with this growth in demand there will obviously be an increase in indigenous chemical manufacture, the opportunities for British chemical exports in the years ahead present a stimulating prospect.

Competition will become keener and the race will go to the efficient producer who can supply first quality products at low cost and support his sales with a thorough-going technical service.

Whatever may be the final relationship of the E.F.T.A. and E.E.C. countries, we must look forward to Britain retaining her rightful place as a major participant in European trade development and so equip ourselves to play this part to the full. The trading disadvantages of our geographical position vis-a-vis the Continent should obviously be reduced as far as practical considerations allow. Establishment of stocks of chemicals at strategic points on the Continent to ensure speedy delivery to our Continental customers and the prompt availability of technical service facilities are two aspects to which my company is paying particular attention.

MILES THOMAS,
Chairman,
Monsanto Chemicals Ltd.

Export Expansion Lies in Lesser Developed Countries—A.C.C. Chairman

IT has been said that two-thirds of the population of our world either suffer from malnutrition or are on a bare subsistence level. Quite apart from our responsibility to see that living standards are enhanced in the under-developed areas. surely this position provides unrivalled opportunity for promotion of exports of chemicals to new and growing markets.

Whilst we must, of course, continue to do our utmost to retain and build up our trade with the European countries and our other traditional markets we must be careful not to allow our preoccupations with the political and commercial complexities of 'Outer Sevens' and 'Inner Sixes' to get out of focus in the wider vista of opportunities before us in other parts of the world. It is to the brains and energies of our own people and to the markets of the lesser developed countries in Asia, South America, Africa and the East that we must turn for the further development of our chemical exports.

Yes, the opportunity is there but something more than opportunity is needed. Whether it be in Europe or in the search of markets further afield, we must be prepared for unrelenting competition from other exporting countries. Whilst we must look forward rather than back, a salutory reminder of the invigorating competition of the '30s may not be out of place. In those times it went without saying that price and quality had to be right and real success stemmed from service to customer second to none. In an age of rapid development in a growing

M. J. C. HUTTON-WILSON
Associated Chemical Companies Ltd.

chemical industry, let us see that the same resilience, flexibility and will to serve the customer is not lost sight of in search of the broader concept of growth.

We must be prepared to use to the fullest extent the advantage of modern communications. Personal contact with the customer at all levels, better quality goods, technical and sales service backed by up-to-date techniques and production methods, are essential ingredients for the future success of British exports.

With this approach and continued enthusiasm we can look with confidence at the prospects for British chemical exports.

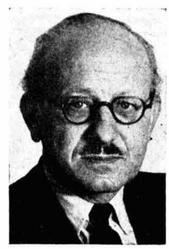
M. J. C. HUTTON-WILSON,
Chairman,
Associated Chemical Companies Ltd.

British Laboratory Chemicals Have High Standing in World Markets

THERE is no reason to doubt that the trend towards national self-sufficiency in pharmaceuticals will continue during the next few years. With the newly-independent countries striving for industrial development of their economies with consequent controls of imports in various ways, and the many countries with regulations which restrict imports, the future of pharmaceutical exports is likely to lie with the supply of specialised drugs or their intermediates, rather than with the finished packed product. British manufacturers have met the situation by setting up manufacturing units in many parts of the world, a policy which will undoubtedly continue.

In the field of laboratory chemicals the progress achieved since the war should be maintained. There can be no doubt of an increased demand in a world which is becoming more and more conscious of the need for scientific education, research and technological development, and where so many countries are endeavouring to modernise and industrialise their economy. British manufacturers, however, will have to meet intense competition from producers abroad, and to work continuously for greater efficiency in production and marketing, if they are to increase their share of this growing world market. The reputation abroad of laboratory chemicals from responsible British makers stands very high and they are used in practically every part of the world. It is difficult not to believe that this section of the British fine chemical industry will not be equal to the stimulus of challenge of the next few years.

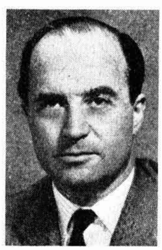
G. F. WILLIAMS,
Managing Director,
The British Drug Houses Ltd.



G. F. WILLIAMS,
British Drug Houses Ltd.

Overseas Market Research and New Plant Capacity as Key to More Exports

THE more highly specialised chemicals have the best export potential for a comparatively small manufacturer such as Howards. A large proportion of the sale of such products is overseas and the demand has increased steadily as user industries have been established there.



J. A. E. HOWARD,
Howards of Ilford Ltd.

The active conditions of the last 12 months have caused the limits of plant capacity to be reached in some instances, and although we have rarely had to turn business away, we have not been able to try to increase it as much as we would like.

As we see it, the divergence between the 'Six' and 'Seven' will cut into our profit margins over the next two to three years, rather than our sales volume, but after that our sales volume may begin to suffer. However, we are sufficiently optimistic to believe that some sort of solution to this problem will be found before then.

We are now paying great attention to overseas market research and are ensuring adequate provision for export sales when planning new plant capacity. When we get these new capacities we can become more active sellers, involving much more travelling, the provision of tanker delivery services to the nearer countries and so on.

J. A. E. HOWARD,
Chairman,
Howards of Ilford Ltd.

Sir Clavering Fison Looks to E.F.T.A. for Big Increase in U.K. Trade

THE importance of the chemical industry to the British economy has increased considerably in the post-war years. Its output by value now amounts to some 10% of total manufacturing industry compared with only 7% in 1948 and employment has increased by 19% over the ten years. In addition, the increases in productivity per man have been amongst the highest for any section in the British economy.

Some 30% of the U.K. output of chemicals is sold overseas (either directly or indirectly) and the rate of increase during the last four years has been double the average increase of U.K. exports. The pattern of Britain's exports in chemicals closely resembles that for the export trade as a whole. Last year 44% of the exports went to Commonwealth countries, 31% to Western Europe and the two largest single customers were Australia and India. These two primary producers are subject to periodic balance of payments crises whenever they suffer an adverse movement in the terms of trade or whenever their plans for economic development outrun their financial resources. Thus India had to impose

SIR CLAVERING FISON,
Fisons Ltd.

measures which substantially reduced her imports of chemicals in 1958 and even Australia has been obliged to impose controls from time to time. Moreover, these countries aim, through internal diversification, to reduce their periodic foreign trade crises. The British chemical industry may therefore find that some of the countries which are now her major export markets will gradually build their own chemical industries.

In this situation it is to be regretted that Britain has been unable so far to come to terms with the Common Market countries. It would seem that, in the six E.E.C. countries, the German and French industries will now consolidate their already dominant position. They in fact aim to achieve this by the formation of larger manufacturing units (through integration and amalgamation) and it seems therefore that British chemical exports will in future meet keener competition. The 'Outer Seven' Free Trade Area offers better prospects. These countries import £212 million of chemicals per annum and obtain only 13% of this from Britain. A considerable increase in British exports would therefore seem possible to this prosperous and stable market.

With the European countries fully emerged from the era of post-war recovery and the primary producing countries building up their chemical industries, the 1960s will be more competitive than the 1950s. Therefore, U.K. chemical exports will be increasingly dependent on products which are the result of exclusive research or which have a decisive cost advantage.

CLAVERING FISON,
Chairman,
Fisons Ltd.

Danger of Two Trade Blocs in Europe is Main Problem

P. D. O'BRIEN,
Laporte Industries Ltd.

ALTHOUGH from time to time the performance of British industry in export markets is compared unfavourably with those of other leading industrial countries, it seems to me that the export record of the British chemical industry in the fifties is something to be proud of, and one hopes that the sixties will see at least a similar growth in our exports. The efforts of our research and development departments in the last decade are now bearing fruit and these should ensure that, given the necessary freedom from trading restrictions, we can more than hold our own in world markets.

The last 10 years have seen an increasing degree of liberalisation in trading conditions between industrial countries, and in my view it is essential that this momentum should be maintained. The problem uppermost in all our minds at present is the dangers arising from the splitting of Europe into two rival trading blocs. Whilst the formation of the European Free Trade Association does in itself give U.K. exporters new opportunities which should not be missed, it is to be hoped that the problems of reconciling the views of the E.F.T.A., and particularly those of the U.K. in regard to Commonwealth trading, with those of the European Economic Community can be solved by patient negotiation and goodwill on all sides.

The situation in North America also gives cause for concern, and it is desirable that the U.S. economy should shortly move to a higher level of business activity with consequent benefit not only to itself but to those other economies with which it is linked. It is to be hoped that the administration, in order to overcome these problems, will not resort to protectionist measures but to a policy of trade expansion and liberalisation.

It is against this background of the problems of Europe and America that the next round of G.A.T.T. negotiations will be followed particularly closely by us all.

In the same context, much emphasis has also been given to the provision of financial aid to under-developed countries. However, whilst this is essential in order to put these countries on their feet industrially, in the long run the tempo of growth can only be sustained by increasing the volume of their foreign trade. For this reason it is heartening to witness the efforts which are being made to persuade the under-developed countries to free their trading arrangements.

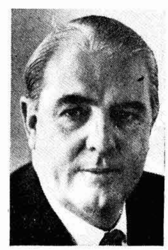
These seem to me to be some of the export problems which we shall have to face in the future and they are of such a nature that they cannot be overcome at one stroke. As in the past, alert and progressive marketing policies, and an awareness of the factors influencing world trade will remain essential to the further expansion of our chemical exports.

P. D. O'BRIEN,
Chairman,
Laporte Industries Ltd.

East Should Provide Greatest Single Growth Market

BEARING in mind a certain Biblical reference to prophets, it was only after some hesitation that I accepted the Editor's invitation (to give my views on future prospects for exports from the British chemical manufacturing industry)!

And I decided to preface my forecast with a short list which must constitute



C. H. TANNER,
F. W. Berk and Co. Ltd.

the reasonably stable conditions without which any look into the future would be valueless. This, in no particular order, is:—

Industrial harmony at home.
Continuing stability of sterling and of our domestic wage structure.
Reasonable import licence policies by overseas governments.
No radical changes in existing tariff agreements.
Currency stability in customer countries.

The past decade has seen enormous and worldwide expansion of industry. Production of chemicals required in this expansion has kept pace and the demands both from home and overseas markets have shown a most satisfactory annual increment. Given 'reasonable stability' I have no doubt that this state of affairs will continue.

Of particular significance is the indication that Eastern European countries wish to further trade. On the other hand there is some uncertainty in our export prospects in Western Europe owing to the recent internal trade agreements. But I have no doubt that the East, including Communist China, should be our greatest single growth market.

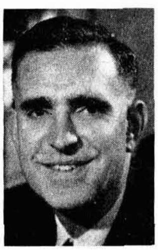
One special field of expansion is the 'Agricultural.' The far-reaching discoveries that have revolutionised the care of crops and the improvement of marginal land have increased demands for the production of certain chemicals that were almost unheard of 20 years ago.

Basically our export future is the logical end of the standard of living spiral. A higher worldwide standard of living demands more food, more land to produce the food, more consumer goods, more housing and more of everything that contributes to this progressive state. All this means more chemicals and in spite of stiff competition from other countries and continents. I am sure that a fair share will come from the British manufacturers.

CLAUDE HUGH TANNER,
Chairman,
F. W. Berk and Co. Ltd.

Rising Trend of Pharmaceutical Exports

EXPORTS by the British pharmaceutical industry reached an all-time record of £40.1 million in 1959. Exports have trebled since the war, and now represent well over one-quarter of the industry's output. British manufacturers



W. J. HURRAN
Glaxo-Allenbury's (Export) Ltd.

have long been 'export-conscious' and there is every reason to expect that they will continue to develop larger markets for their products overseas. The rising trend of pharmaceutical exports should therefore continue, provided always that the flow of new products from the industry's research laboratories is maintained and provided that growing competition from abroad can be met by increasing technical efficiency and lower costs. In the latter respect, the industry's record of maintaining virtually constant prices in a period of steady inflation is particularly impressive. In many markets, direct exports from the United Kingdom may temporarily be reduced by the establishment by U.K. firms of local manufacturing plants; but all the evidence suggests that, in the long run, these local facilities are likely to lead to an increase in the demand for products of British origin.

W. J. HURRAN,
Director and general manager,
Glaxo-Allenbury's (Export) Ltd.

Investment in New Processes is Key to Continued Export Success

THE development policy of The Distillers Co. Ltd. since the war has been geared to meet the production of more complex chemicals than those which formed the mainstay of its pre-war exports. This has enabled the company to adapt itself to the trading pattern which has resulted from increasing industrialisation overseas.

Between the already highly industrialised countries there is very strong competition in export markets. Somewhat surprisingly, however, there is also a considerable volume of trade between them, arising partly from different forms of specialisation in the countries concerned. Germany is probably one of the U.K.'s biggest competitors; nevertheless, Germany is one of our very good customers—and the same is potentially true of the U.S.S.R.

Post-war petroleum chemicals developments in the United Kingdom have resulted both in cheaper routes to existing products and in making available, at low prices and in large quantities, chemicals which were not previously articles of commerce, particularly for the plastics and synthetic fibre industries. The fact that petrochemical developments are confined to a few highly industrialised countries produces opportunities both for export of petroleum-based products to the less industrialised countries, and for licensing arrangements and the export of 'know-how' to countries where a petroleum chemical industry is being developed.

For the future, new economic trends, to a large extent, can be anticipated, but flexible policies will be needed to meet sudden changes in the attitudes of governments and consequent changes in demand. If opportunities are to be grasped, research and development must be carried out with a sense of urgency

T. F. ANTHONY BOARD,
The Distillers Company Ltd.

and on an adequate scale. Timely investment in the most modern and efficient processes is essential to continued success in the chemical export markets of the world.

T. F. ANTHONY BOARD,
Director,
The Distillers Company Ltd.

'Chemical Age' wishes to express its sincere thanks to the many leaders of the British chemical industry who have made these valuable contributions to this special Overseas Edition.

Winthrop Group's Export Achievements in Western Europe

HOW the Winthrop Group set up subsidiary companies in nine Western European countries, obtained offices and established warehouses there, and trained local nationals to staff these organisations, from managing directors downwards—all in the space of 18 months—was described by Mr. L. M. Spalton, chairman of the Winthrop Group Ltd., at the opening of the Winthrop headquarters at Surbiton, Surrey. He revealed that nearly 50% of the output of Winthrop's large and highly mechanised factory in Newcastle upon Tyne is today shipped overseas. But, with an eye on the great Swiss pharmaceutical companies, whose business outside Switzerland represents 97% of their sales, Winthrop are still not satisfied with their own export achievements.

However, said Mr. Spalton, it gave Winthrop a special sense of achievement to be competing energetically in Western Germany, because until 1939 that pioneering pharmaceutical firm Bayer of Leverkusen held a 50% shareholding in Bayer Products Ltd., which now forms one of the larger divisions of the Winthrop Group. Many of the products that were introduced by Winthrop originally stemmed from German research, but today 90% of their products came from their own research or that of their associates. "It gives us great satisfaction," Mr. Spalton said, "to take the results of our research to Germany and to have Winthrop of Frankfurt very actively competing with the large German pharmaceutical houses."

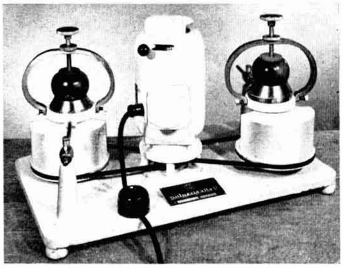
The new Winthrop headquarters at Surbiton is a 10-storey building which will house, to begin with, 400 of the company's 2,000 personnel working in, or based in, the U.K. The opening of the building was followed by an exhibition, entitled "Medicine Men of Today", which illustrated the many facets of pharmaceutical research, manufacture and marketing.

DUPLO MODEL

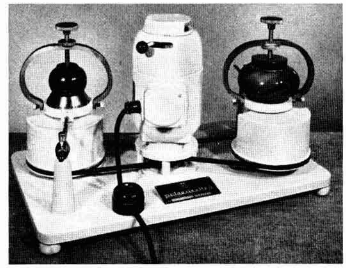
pulverisette 0

MADE IN GERMANY REGIST. TRADE-MARK

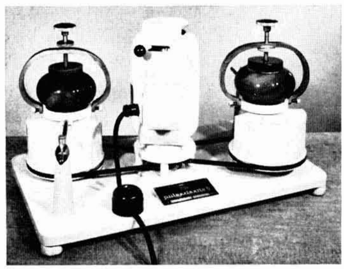
Only with REPULSION MOTOR
with 110/220 V. A.C. 150 Watt



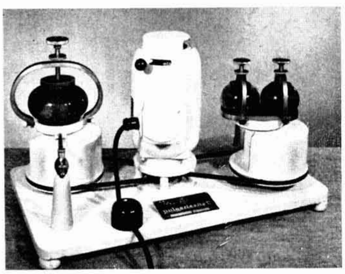
Modification 050/A
Duplo / 2 x Micro
2 small (Micro) Grinding Bowls



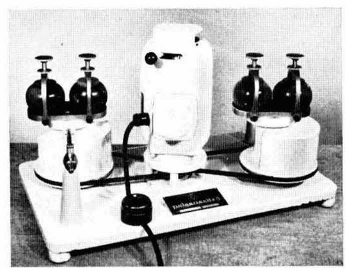
Modification 050/B
Duplo-Standard / Micro
1 large and 1 small (Micro) Grinding Bowl



050 DUPLO-STANDARD
2 large Grinding Bowls



Modification 050/C
Duplo-Standard / 2 x Micro
1 large and 2 small (Micro) Grinding Bowls



Modification 050/D
Duplo / 2 x 2 Micro
4 small (Micro) Grinding Bowls

INTERCHANGEABLE GRINDING PARTS

Ref. Nr.	Grinding Bowl with Lid	Volume ~ c. cm.	Useful Capacity ~ c. cm.	Abrasion	Net weight gr	Grinding Balls Recommended
025	Hard Porcelain	250	150	medium	1700	2 balls 40 mm ⌀ or 6 balls 30 mm ⌀
026	Agate, large	250	150	weak	1900	2 balls 40 mm ⌀ or 6 balls 30 mm ⌀ or 1 ball Agate 50 mm ⌀
027	Agate, Small (Micro)	50	30	weak	600	2 balls 20 mm ⌀

GRINDING BALLS:

Grinding balls of "AF-Sintered-Sapphire" have a higher specific gravity and are harder than Agate, but possess — in comparison with the more homogeneous Agate — a far higher abrasion.

Alfred Fritsch
Hauptstrasse 542
Idar-Oberstein 1

Only with REPULSION MOTOR
with 110/220 V. A.C. 150 Watt

DUPLO MODEL

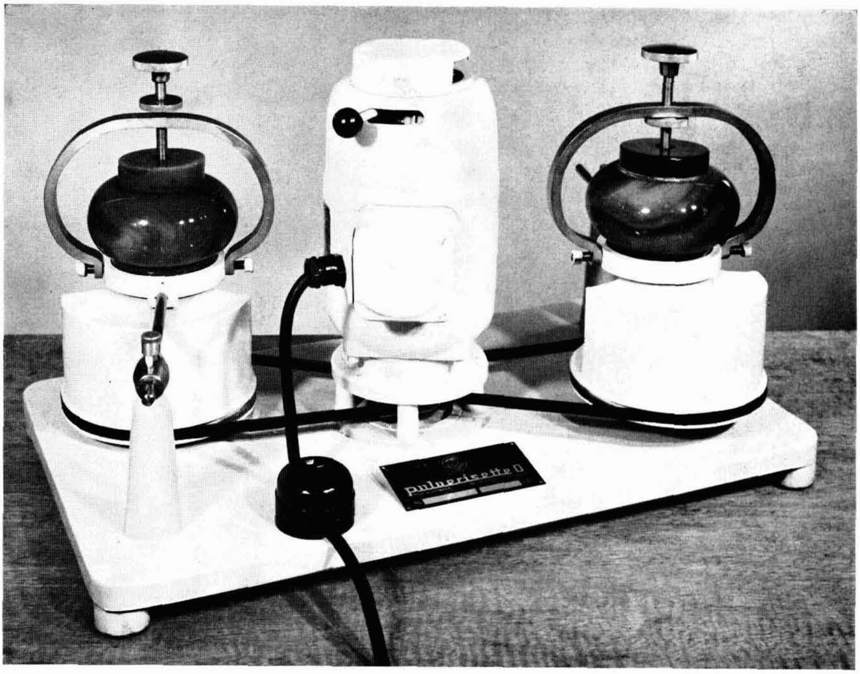
LABORATORY CENTRIFUGAL BALL MILL

with grinding bowl and grinding balls for colloidal micro pulverising, also suitable for grinding twisted or fibrous batches, and for interblending of *various substances.*

pulverisette 0
MADE IN GERMANY REGIST. TRADE-MARK

Ref. Nr. 050

Continuous revolution of grinding bowl to be regulated by lever.
Feeding grain size: < 5 m.m.



DUPLO STANDARD

pulverisette 0 - DUPLO
MADE IN GERMANY REGIST. TRADE MARK

for intermittent powdering of small samples. The grinding balls are catapulted by centrifugal force on to the wall of the dustproof bowl. The stickier the substance to be ground, the smaller the balls to be used:

- finest pulverising up to any fineness required.
- **new:** extra hard materials difficult to be grind are ground in the agate bowl of 250 c. cm volume by only one 50 m. m. ⌀ agate grinding ball.
- **new:** Regular Standard Fitting with 2 'AF-Sintered-Sapphire' grinding balls which guarantee rapid grinding because of their extraordinarily high specific gravity of 3.75.
- ***new:*** *Quadruple Micro Agate Grinding Bowls (each 50 c. cm. volume), for simultaneous finest pulverising of 4 samples* of about 30 c. cm. each.
- strong motor – 150 Watt
- with each revolution the grinding bowl moves a few millimeters up and down. This causes the grinding balls to work eccentrically in rear action, which, in its turn, causes quicker grinding compared with concentricity
- **new**: by casting-off the V-belt one grinding bowl can run alone
- ball bearings
- heavy cast iron base – the guarantee of stability
- **new:** by lever action you can rotate the grinding bowl both ways, left and right. This way, putting a great number of small grinding balls into the bowl, simultaneously you can mix and grind even material which is rather sticky, by changing from time to time the grinding bowl's direction of rotation. By this sudden change, the balls are forced to break into the charge.

Variations:

Ref. Nr.: 050	= Duplo Standard	= Volume: ~ 2 x 250 c.cm.	= Useful capacity: ~ 2 x 150 c.cm.
Ref. Nr.: 050/A	= Duplo-2 x Micro	= Volume: ~ 2 x 50 c.cm.	= Useful capacity: ~ 2 x 30 c.cm.
Ref. Nr.: 050/B	= Duplo Standard/Micro	= Volume: ~ 250 + 50 c.cm.	= Useful capacity: ~ 150 + 30 c.cm.
Ref. Nr.: 050/C	= Duplo Standard/2 x Micro	= Volume: ~ 250 + 2 x 50 c.cm.	= Useful capacity: ~ 150 + 2 x 30 c. cm.
Ref. Nr.: 050/D	= Duplo/2 x 2 Micro	= Volume: ~ 4 x 50 c.cm.	= Useful capacity: ~ 4 x 30 c.cm.

Trade with Soviet Union

Advantage of Selling Know-how at 'Reasonable Price'

THE Soviet Union has never been regarded as an important market by the British chemical industry. The chemical industry within the Soviet Union itself was given a relatively low priority compared with the engineering and extractive industries. Basic chemicals were produced in sufficient quantities to service these industries and supply such consumer industries as were established. Few foreign firms saw the prospect of any continuing business.

In addition, the methods of doing business were not such as to encourage enterprise. No contact with the eventual consumer was possible, all negotiations were carried on through a complex bureaucracy and conditions of contract were draconian.

There has in the last few years been a good deal of change in most respects. More flexible methods of doing business have been adopted, some initiative on the part of the user firm is now possible and the emphasis of the planners has changed.

The Soviet economy is essentially planned and it therefore follows that before examining the prospects of increased trade in chemicals with the U.S.S.R. a short summary of the overall plan is essential. The latest 7-year plan which was approved in 1958 covers the years 1959 to 1965. In some ways this plan is not as ambitious as the previous 5-year plan, the overall annual compound rate of growth of industrial output which was 13% per annum according to the official Russian pronouncements (or 10½% according to the other more conservative estimates) has now been reduced to 8½% per annum. Within this rate of growth there has been a considerable shift of emphasis as between various industrial sectors. The output of the following industries is expected to increase by more than 10% per annum compound over the years to 1965 (in order of magnitude of the rate of increase):—

1. Chemical industry
2. Iron and steel
3. Oil and gas
4. Timber and paper
5. Light industry, including food processing.

So far the pattern of Soviet imports has consisted of purchases of industrial raw materials, semi-manufactures and heavy machinery with occasional purchases of food as and when required, e.g., sugar in 1957. Chemicals and pharmaceuticals have represented a small albeit growing proportion of total grade (approximately 5% of the total U.K. export to the U.S.S.R.). This general pattern (emphasis on machinery) is expected to continue and can be illustrated by the following figures: of a total of large orders (£¼ million or over) placed with U.K. firms in 1959 amounting to about £37½ million, some £35-36 million are for heavy machinery. semi-manufactures and complete plants. Against these large orders and a number of others now under negotiation, only approximately £3½ million worth of U.K. consumer goods (including durable consumer goods) are to be bought each year.

Nevertheless there appears to be an opportunity for a small but growing market in the U.S.S.R. for certain types of chemicals and pharmaceuticals. Russia's major imports of chemicals from all foreign countries have been as follows (in million U.S. dollars):—

	1955	1956	1957
	U.S. $million		
Dyes, lacquers and tanning chemicals	7.5	13.4	15.3
Pigments, colours	6.6	12.1	13.4
Pharmaceuticals and cosmetics	5.7	11.1	23.1
Plastics	7.6	11.2	11.0
Agricultural chemicals (mainly pesticides and insecticides)	4.4	4.5	8.8
Total	31.8	52.3	71.6

Of the 1957 total of $71.6 million some $3.5 million were imported from West Germany and $0.4 million from the U.K. In plastics the disparity is bigger still; in 1956 Germany exported some $4 million worth of goods, while the U.K. only some $0.8 million. In pharmaceuticals the U.K. and Germany hold approximately an equal share of Soviet imports.

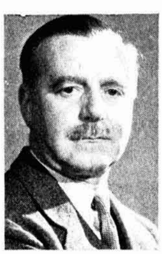
Russian imports of dyes, pigments, etc., from outside the Communist world are unlikely to increase to any large extent as they represent mainly bulk chemicals which can and will be manufactured within the Soviet Economic Area. On the other hand it may be expected that imports of new pharmaceuticals, plastics and agricultural chemicals resulting from the highly developed research and development work of laboratories in the West would increase faster, particularly as more attention is given to the needs of the Russian consumer. It is these faster growing imports that present a challenge to the U.K. manufacturers. The production of these chemicals contains a high element of capital cost and/or involves the manufacturer in considerable research and development expenditure per unit of output, while there is only a very small element of imported raw material costs. Hence exports of these products are highly beneficient to our economy.

It should be appreciated that although there is a patent monopoly system in Russia, this does not operate in quite the same way as in the capitalist countries. Thus, for example, there is apparently no record of any patent infringement action having been undertaken in the Soviet Union. Hence technical know-how and capital costs of production are more important than a tight patent position. In many cases, particularly when rapid technological developments would supersede products or processes in the course of time, it seems more advantageous to sell outright at a reasonable price the manufacturing know how and any patent rights. This can be done by tendering and obtaining a contract to build a factory in the U.S.S.R. A number of such contracts have recently been obtained by U.K. companies, the largest

(Continued on page 720)

By Mr. A. Wormald,

Managing Director, Fisons Ltd.



MR. A. WORMALD, commercial director of Fisons Ltd. from 1950, and formerly managing director of the company's Chemical Division, is now one of two managing directors of Fisons Ltd., which became a holding company on 1 January 1960. In addition to his duties as a managing director of the holding company, Mr. Wormald is in executive charge of the company's principal non-fertiliser interests, i.e. Fisons Pest Control Ltd., Genatosan Ltd., Whiffen and Sons Ltd., Benger Laboratories Ltd., and Fisons Chemicals (Export) Ltd.

Mr. Wormald is 48 and has spent the whole of his business life, except for war service, in the chemical industry. His special interests are business organisation, especially the integration of scientific research into industry, and the application of the methods of economic research to business problems.

He is a firm supporter of European unity, both political and economic, and of closer relations with Soviet Russia. He is deeply interested in the history and institutions of Europe, and speaks all the principal languages, including Russian.

Exports of Plastics Materials

Overseas Trade in Plastics is of Growing National Importance

PLASTICS are exported in three ways: as raw materials, such as p.v.c. resins or urea moulding powders; as component parts of manufactured products, e.g., a refrigerator liner made from polystyrene; and as finished articles in their own right, such as polythene bowls or p.v.c. raincoats. Because the use of plastics is so diverse it is obviously impossible to calculate how much material goes abroad as component parts and it is also difficult to assess how many plastics products are sold overseas since, within a particular category or classification, official statistics seldom discriminate between plastics and non-plastics goods.

Both plastics components and finished articles are important to our overseas trade. Thus, the Viscount airliner which embodies hundreds of plastics parts, and British-made plastics toys are popular in many countries, and bring in worthwhile revenue. The object of this article, however, is to discuss the contribution made to our export trade by plastics materials *per se,* a factor which is becoming of some importance to the national economy.

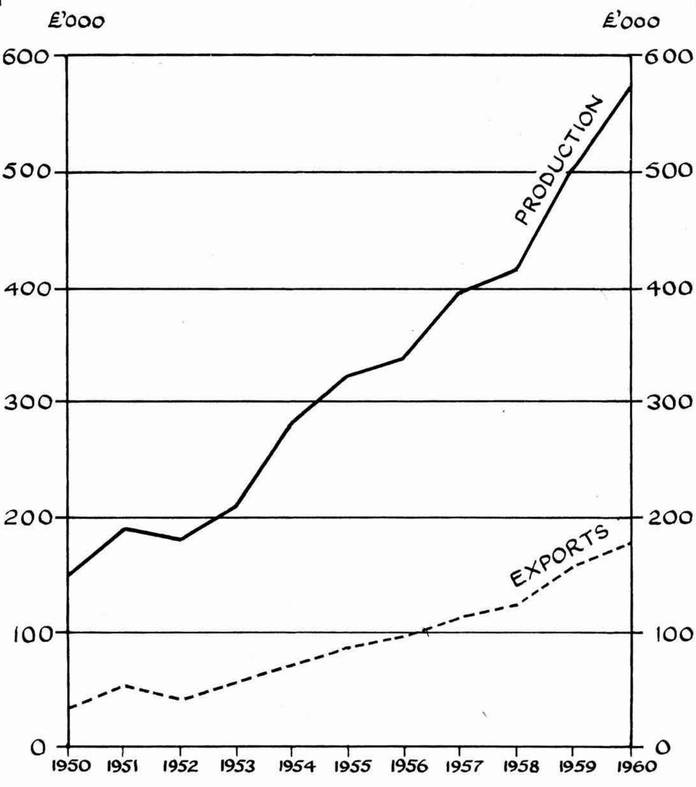
In 1959 about 500,000 tons of plastics materials were manufactured in Great Britain, of which some 150,000 tons were exported, or approximately 28%. The value of these exports was about £40 million. To put this figure immediately into perspective, the total value of all British exports last year was £3,326 million. Thus exports of plastics materials accounted for about 1.2% of the total value.

This is a small percentage, but by no means insignificant, and there is every reason to expect that it will increase. Table 1 shows how plastics exports have grown in importance during the last 10 years, rising steadily each year from about 0.28% in 1949 to the current level of 1.2% (except for 1952, which was a year of recession generally). It is interesting to compare the advance of plastics with that of aircraft and road vehicles, which are very important exports indeed. Only in the last three years has the latter group increased as a percentage of our total exports, whereas plastics exports have made continuous progress.

If all other factors remained constant it would be reasonable to assume that in 10 years from now plastics would account for about 2.5% of our total exports. Is this likely? Table 2 gives a clue. Expressed as a percentage of production, our exports have, on the whole, tended to increase by about 1% per year during the last 10 years. Assuming that production in 1969 were some 900,000 tons and that exports accounted for 40% of that production, then the value would be of the order of £90 million. If the value of all our exports rose to £4,300 million, then plastics would represent about 2.3%.

Production and Exports of Plastics Materials

1960 Figures are Estimated



Production is the Key

All this speculation has been based on the fact that production of plastics will continue to grow at the rate of the last decade. Obviously production is the key.

At present most manufacturers of plastics materials are working to nearly full capacity, although there have been signs during recent weeks that stocks of materials generally are increasing as a result of a slight (and temporary) falling off in demand. Even so, polythene sales are soaring, polystyrene is in great demand and p.v.c. sales are higher than ever before. As these three materials account for nearly half the U.K. output of plastics, it is evident that future expansion in their production is of vital importance to the industry as a whole.

Manufacturers are confident: polythene capacity is likely to be increased by some 50%, and capacity for polystyrene by 75%. Also, it has been necessary in recent years to import considerable quantities of p.v.c. to meet the growing demand for this material —12,000 tons were brought in during 1959. I.C.I. and British Geon have both announced plans for additional plant to make p.v.c., and this should

add some 30,000 tons (about 30%) to U.K. capacity during the next two years.

It thus appears that the production of the 'big three' thermoplastics could well be at the level of 350,000 tons by 1962, which would give Great Britain a capacity for all plastics of about double that amount. Hence if in three years' time roughly 35% of our plastics production is exported, then the value of those exports would be roughly £60 million. If continued, this rate of growth—which is substantially greater than that of the last three years—would mean that by 1969 plastics exports could amount to £150 million, an important contribution to our overseas trade.

This is a bright picture, but several vital qualifications must now be made.

1. The effect of the European Economic Community (E.E.C. or 'The 'Six').
2. Competition everywhere from the U.S., Germany and Japan.
3. The influence of the European Free Trade Association (E.F.T.A. or 'The Outer Seven').
4. Progress in trade between this country and the U.S.S.R., and the East European countries.

At first sight it would appear that 1 and 2 will tend to be cancelled out by 3 and 4. Great Britain currently manufacturers about 80% of the plastics produced within the E.F.T.A. and is likely to maintain this dominant position for some time.

On the other hand, British exports to E.E.C. are certain to meet with stronger competition as production within the six countries becomes more co-ordinated and more efficient. Some French and German companies, for example, are already beginning to co-operate in the manufacture and marketing of plastics and it is highly probable that the development in joint enterprises of this kind within E.E.C. will make it increasingly difficult for outsiders to sell there.

This is a particularly serious problem for British exporters. Until now Europe has been the most rapidly developing market for plastics and E.E.C., with a combined population of 162 million, comprises two-thirds of that market. Since the war British exports of plastics have always been widespread, with the Commonwealth countries among our most important customers. In the last few years, however, they have not shown the same acceleration in demand as some of the European countries, and British exports to Europe—although still increasing—have fallen in proportion, notably as the result of increasing competition from Germany. Indeed, Germany now has 25% of the total export market in plastics. nearly half as much again as the British share of 18% and over 60% of her exports are to Europe.

Another result of the formation of E.E.C. will be competition in third markets, not only in those territories outside E.E.C. and E.F.T.A., but also within E.F.T.A. itself, where the tariffs for most plastics are low. Once again Germany is likely to exploit her geographical advantage in trade with countries such as Denmark, Switzerland and Austria, quite apart from any economic advantage resulting from her cooperation with the other E.E.C. countries. At present Germany is selling about 50% of the total plastics used by E.F.T.A. (not including Great Britain), with the U.S. and Canada selling 25% and Great Britain 22%.

To some extent the E.E.C. will have an edge in selling plastics to Russia, which is a market of growing importance to Great Britain. Although Russia has plans for a great expansion of her chemical industry, including plastics, it is certain that for the next few years at least there are good prospects for anyone wishing to export materials which the Russians are not at present making in sufficient quantity themselves, notably polythene and p.v.c. Here again British exporters will have to ship their materials further than the Germans, and will also probably encounter heavy competition from Japan, particularly in selling p.v.c.

One effect of E.E.C. has been that many U.S. firms are pushing ahead with plans to set up inside E.E.C., as distinct from Great Britain, where in the past the Americans have generally preferred to set up subsidiaries. Quantitatively this is going to weaken the British position while qualitatively it could also mean that this country might be barred from selling certain polymers within E.E.C. because of patents or licensing arrangements. Thus a U.S. company making polymer X and licensing its manufacture to a company in Great Britain might also set up a subsidiary within E.E.C. to produce this material, and this could prevent the British firm from competing there. For these and other reasons it is obviously essential for British firms to establish manufacturing facilities inside E.E.C., although there have been little signs of this so far.

Within the limits of this short article an attempt has been made to show the prospects for our export trade in plas-

Exports of Plastics Materials by Countries

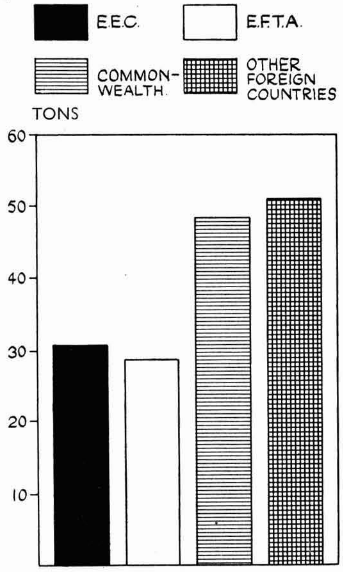


TABLE 3: EXPORTS OF PLASTICS MATERIALS IN 1959

	Tons
Acrylic (mainly sheet)	6,248
Amino resins	10,616
Amino moulding materials and extrusion compounds	7,013
Cellulose acetate	3,220
Cellulose acetate sheet	1,182
Phenolic resins and moulding materials ...	14,000†
Polystyrene	12,500†
Polythene	30,000*
Polythene film, sheet, etc.	1,627
P.V.C. polymer	14,143
P.V.C. compound	10,171
P.V.C. sheet	6,264
P.V.C. in other forms	799
Scrap and celluloid	7,958
All other materials, including alkyds, nylon, p.v.a., and p.t.f.e.	32,000†
	157,741

* Estimated. † Approximate figure.

TABLE 1: EXPORTS SINCE 1949

Year	Value of Exports in £ millions: All goods and commodities	Plastics	Aircraft and road vehicles	Plastics as % of whole	Aircraft and road vehicles as % of whole
1949	1,786	5.1	—*	0.28	—
1950	2,171	9.1	—*	0.42	—
1951	2,580	16.3	300	0.63	11.6
1952	2,582	13.6	312	0.53	11.7
1953	2,582	16.5	290	0.64	11.2
1954	2,674	20.5	307	0.76	11.5
1955	2,905	22.8	337	0.79	11.6
1956	3,172	26.1	372	0.83	11.8
1957	3,324	29.9	403	0.90	12.1
1958	3,172	32.1	450	1.0	14.2
1959	3,326	40.0	488	1.2	14.6

* Due to a change in official classifications, figures have not been included for these years.

TABLE 2: PRODUCTION AND EXPORTS OF PLASTICS SINCE 1950

Year	Production	Exports	% Exported
1950	150,000	35,150	23.5
1951	190,000	53,150	28.0
1952	180,000	42,275	23.5
1953	210,000	56,450	27.0
1954	280,000	70,125	25.0
1955	325,000	85,000	26.0
1956	340,000	98,000	29.0
1957	395,000	111,800	28.5
1958	415,000	122,600	29.5
1959	500,000	157,360	31.5
1960*	575,000	175,000	30.4

* Estimated.

tics materials. Judging by our current achievements the future looks good, until the significance of E.E.C. is examined. Then some doubts begin to arise. If the addition of 35 million to the British market by the formation of E.F.T.A. has engendered any complacency it must be shaken off by imaginative and determined action on the part of the plastics materials manufacturers, otherwise our export trade will not prosper and may even fail to hold its own.

As far as Europe is concerned, we should begin *now* to set up production units within E.E.C.

From the long term point of view our policy should be to manufacture a diversity of polymers which are highly specialised and for which the demand will only slowly be impaired by indigenous production elsewhere. One of Germany's strengths is in the variety of plastics she can offer and we can learn a valuable lesson from her success. Above all, our main efforts should be towards the invention and development of completely new plastics.

TABLE 4: EXPORTS OF PLASTICS MATERIALS IN 1959 (BY COUNTRIES)

To E.E.C.	Tons	To E.F.T.A.	Tons
W. Germany	5,221	Sweden	7,960
France	7,763	Norway	4,701
Netherlands	6,906	Denmark	6,307
Belgium	5,665	Austria	1,771
Italy	5,812	Portugal	3,633
		Switzerland	3,271
Total	31,367	Total	27,643

To Commonwealth	Tons	Other Foreign	Tons
S. Africa	6,536	Eire	3,300
India	5,402	Finland	4,319
Pakistan	841	Spain	1,194
Singapore	516	U.S.A.	4,374
Hongkong	11,717	Argentina	2,772
Australia	10,398	U.S.S.R.	6,000*
New Zealand	5,014	Others	28,548
Canada	1,955		
Others	5,450		
Total	47,829		50,527

Grand Total 157,360

N.B.—There are some small discrepancies between the grand totals quoted in these tables, due to the inclusion of some estimated totals.

Trade in Chemicals with U.S.S.R.

(Continued from p. 717)

of which so far has been a £15 million contract to build a rayon yarn factory.

The Russians are very keen to obtain the advantages of the West's research and development efforts as, although their technologists are in some cases even more advanced than ours, they are in other matters behind those of the West. They have so far mainly concentrated on basic industrial development in order to increase the wealth of their nation and only recently have begun to give more attention to the consumer. As they now need the more 'sophisticated' products of the Western world, it would seem considerably more expensive to start *ab initio* by diverting technical staff which they may not wish to spare for this extra effort. The building of complete factories will, of course, tend to slow down exports of chemicals, but new developments and new products resulting from research and development in the West should counteract this tendency.

It is also general experience that industrial development tends to increase the demand for imports of secondary manufactures. Relatively small quantities of highly complex intermediates may be required and total consumption may not justify the establishment of production facilities. This trend can already be seen to be operative to some extent in the Soviet Union.

It may be asked whether it is possible for individual firms to take any useful action to secure a share of whatever chemical imports are planned. In the first place, while all major items will be included in the plan, there will undoubtedly be scope for at least some adventitious sales of materials not hitherto known to the Soviet experts. Their documentation, as is now widely recognised is excellent but, of course, cannot be perfect. New products of interest can therefore usefully be brought to the attention of the Russian authorities.

Secondly, while all the principal suppliers of planned items will be known to the Soviets their choice of a supplier may be rather arbitrary. The buying organisation will not be as fully aware of the merits of individual firms in various countries, as Western buyers could reasonably be expected to be.

In both these cases it is worth while approaching the Soviet authorities, whether or not an inquiry has been received from them. In general it may be said that this approach should be at several different levels: the Trade Commission in London, the Ministries in Moscow, and where contact can be made (which is quite often) the ultimate industrial customer in the Soviet Union. Patience and persistence are required as the State machine is always taxed to the limit and always working against time to exceed the plan. Once contacts have been established they may well prove to be durable as the Soviet authorities tend to prefer established connections, once they are satisfied that the firm concerned is a satisfactory supplier.

Annual Conference on Industrial Safety

All facets of protection and their relationship with industrial safety will be discussed when industrial safety officers meet for their 7th annual conference at Lytham St. Annes, from 28-30 October.

The programme will include papers on the medical aspect of protection by Dr. G. O. Hughes, chief medical officer, North Western Gas Board, and protective clothing by Mr. N. T. Freeman, Billingham works personnel officer, British Titan Products Ltd.

Gap Widens in U.K.—E.E.C. Trade

THE U.K. Trade and Navigation Accounts for August, the latest available, show that U.K. exports of chemicals to the European Economic Community in the eight months were valued at £37.11 million, 21% higher than in the same period of 1959. The Netherlands were our best customer, followed by West Germany, Italy, France and Belgium.

Imports of chemicals from the E.E.C. were valued at £46.12 million, a rise of 32.7%. West Germany supplied just under half, followed by France, the Netherlands, Italy and Belgium.

A year ago U.K. imports of chemicals from the E.E.C. were by value 13.19% higher than U.K. exports to that area; the gap has since widened and imports from E.E.C. are now 24.2% higher.

U.K. EXPORTS TO E.E.C.

	January-August 1959	January-August 1960	% Rise in 1960
To:	£million		
Belgium	4.51	4.83	6.9
France	4.87	5.52	13.3
Holland	7.91	10.70	35.2
Italy	6.30	7.15	11.9
W. Germany	6.89	8.91	29.3
Total	30.48	37.11	21.0

U.K. IMPORTS FROM E.E.C.

	January-August 1959	January-August 1950	% Rise 1960
From:	£million		
Belgium	3.23	3.23	—
France	7.97	10.53	32.1
Holland	5.96	8.91	49.4
Italy	2.55	4.35	74.5
W. Germany	15.03	19.10	27.7
Total	34.74	46.12	32.7

U.K. exports to the countries of the European Free Trade Association in the first eight months, totalled £20.36 million, an increase of 14.2%. Imports from Denmark, Portugal, Sweden and Switzerland rose by 25.9%.

U.K. EXPORTS TO E.F.T.A.

	January-August 1959	January-August 1960	% Rise in 1960
To:	£million		
Austria	0.83	0.92	1.0
Denmark	3.53	3.76	6.5
Norway	3.44	3.66	6.3
Portugal	2.09	2.33	11.4
Sweden	5.55	6.94	23.2
Switzerland	2.37	2.75	16.0
Total	17.81	20.36	14.2

U.K. IMPORTS FROM E.F.T.A.

	January-August 1959	January-August 1960	% Rise in 1960
From:	£million		
Austria	n.a.	n.a.	—
Denmark	0.38	0.69	81.5
Norway	n.a.	n.a.	—
Portugal	0.79	0.94	18.9
Sweden	1.88	2.24	19.1
Switzerland	4.03	5.05	25.3
Total	7.08	8.92	25.9

80% of the fall in U.K. total exports between the 1st and 3rd quarters was in sales to North America, with sales to the U.S. down by 27% and to Canada by 10%. Chemicals shared in this decline, although figures are not yet available. From January to August, chemical exports to the U.S., valued at £7.15 million, were down 5.8%, and to Canada, at £5.59 million, were down 5.4%.

SHIPMENT IN BULK HELPS CHEMICAL EXPORTERS CUT TRANSPORT COSTS

THE need to remain competitive in overseas markets necessitates a constant review of methods of transport and types of containers, to take advantage of new developments which might lead to a reduction in transport costs. This is equally so in the home trade but, due to the comparative smallness of the geographical area covered, it is a simpler matter to keep costs to a minimum than in the overseas market.

Broadly speaking these costs consist of the container itself and the freight to carry this container and its contents to its destination. As the latter is based either on gross weight or cubic space occupied, it is obviously desirable to keep the tare or measurement ratios as low as possible.

These facts have resulted in recent years in an increase of emphasis in the development of methods of carrying products in bulk, up to the point that can sometimes be reached where conventional package costs are eliminated and transport costs are, therefore, at a minimum. The ultimate example of this is the shipment of large tonnages of chemicals in bulk by sea. This method is, of course, somewhat limited as the chemical characteristics of some materials do not lend themselves to such large scale movements. There are, however, several intermediate stages towards this ideal and these are briefly described under their respective headings.

Drive-on, Drive-off

Rail or Road Tanks. Ferry services to West Europe on the 'drive-on, drive-off' principle exist for rail and road traffic, for example, Tilbury/Antwerp, Felixstowe/Rotterdam, Dover/Dunkirk and Harwich/Zeebrugge. Road tank deliveries can also be made to Northern Ireland.

These give satisfactory methods of shipment in 12 to 20 ton lots and rail freights are such that the cost per ton to destinations such as Holland, Belgium, France and Germany are generally cheaper than packages, having taken all facts into consideration.

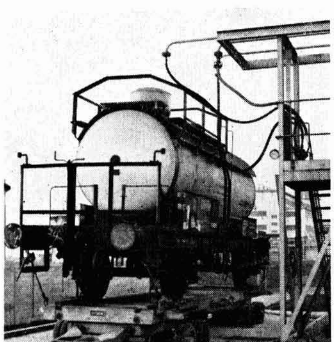
Road tank deliveries from Britain to Europe are a comparatively new innovation, but the economies are frequently dependent on a certain amount of back-loading.

Demountable Tanks. These are usually designed on the principle of a road tank barrel which is capable of being carried on a road or rail vehicle, but which can still be carried on board ship. Generally speaking, they are designed for liquids with a carrying capacity of between six and 10 tons. The method of construction is dependent on the material to be carried, but it is obviously desirable for the tare weight to be as low as possible and for the physical construction to be such that the minimum amount of shipping space is taken up. There are limiting factors governing the gross weight as the capacity of cranes for lifting purposes varies at both despatching and receiving ports. When used as a substitute for rail tanks it is still necessary to comply with the regulations appertaining to rail transits to the Continent.

Author of this article is head of the transport department of a large northern chemical company, which exports a considerable proportion of its output. His main interest in new developments is in the cutting of transport costs

The main obstacle at present to the more general use of this method is that the freight on the return of the empty tank is relatively high and return cargoes are not always available. The turnround of the tank is also extremely important as these are expensive containers and unless they are made capable of carrying large tonnages over a great number of trips then the cost of providing the tank will very often exceed the cost of normal packages. It follows, therefore, that such a method of conveyance is more attractive for the short distance hauls such as Northern Ireland and the near Continent.

It is the need to reduce the returned empty freight that has led to attempts to develop a suitable collapsible tank constructed of rubber or plastics materials. While some of these have proved suitable for certain products there is no generally accepted material yet for a wide range of the more hazardous chemicals.



Tanker being loaded with butadiene at I.C.I.'s Wilton Works for export to Europe

It is becoming evident that the shipping companies are aware of the need for small tanks and some shipping lines are already offering such containers. These can be classed as demountable tanks, but it is usually cheaper for them to be filled or discharged 'in situ' from, and to, road or rail vehicles. This avoids the heavy lift charges associated with such containers and encourages the use of marginal transport for the movement to and from the docks.

Intermediate Containers. It is possible to design and use intermediate bulk containers of two to four ton capacity which can be extremely light in construction and usually rectangular in shape, thus keeping freight costs to a minimum. They are not suitable for pressure discharge as emptying must be by pump or gravity, but, given a suitable turnround, they are more economical than drums and are not dependent on large scale business. They also avoid the necessity of the customer having to instal large stock tanks.

Bulk Cargoes. Oil and petroleum have for many years been carried in sea tankers varying in capacity from a few hundred to many thousands of tons. In recent years some of the smaller vessels have concentrated on carrying so-called 'clean' cargoes which are in fact some of the more pure chemicals such as the various solvents. There are inherent dangers of contamination, but many thousands of tons per year are now being transported successfully by this method and if the necessary precautions are taken then this type of transport provides the most economical one so far evolved. It is usually necessary to have stock tanks at both the loading and receiving wharves, thus enabling the ship to be loaded and discharged by pipeline with the minimum of delay. Such installations already exist at the majority of U.K. and foreign ports or the cost of erection can often be recovered after only a short period of time if the scale of business is large enough. It is usually necessary to have all shipments in minimum 300/500 ton lots with an annual turn-over of at least four times the storage capacity.

It may be possible to load and unload such tank ships by road or rail vehicles, but as it is extremely difficult to forecast the movement of such ships with any degree of accuracy, this may result in transport lying idle for several days at considerable cost.

In addition to solvents, ships are available for special purposes such as the movement of liquefied gases in bulk; certain types of acids can also be carried where a special lining for the ship's tanks is not required.

Experiments with large flexible containers which are towed behind barges have recently been successfully undertaken to transport liquids by sea, but this method has limitations in that it can only be used at present for liquid products lighter than water and those that

(Continued on page 723)

EXPORT OF CHEMICALS BRINGS GREATER PROSPERITY TO MERSEYSIDE TOWNS

PROSPERITY of Merseyside, particularly the group of towns which lie around the head of the estuary, is closely related to the chemical industry and for centuries the saltfields of Cheshire have supplied the overseas markets with one of the chief raw materials for the manufacture of heavy chemicals.

Hence, chemicals rank high on the list of exports passing through the port of Liverpool. In this category must be included not only the production of salt, amounting to about 1 million tons a year, but a long list of chemical products diversified enough to warrant a catalogue of their own. Widnes, Runcorn, Warrington and St. Helens, are the main production centres and they give employment to tens of thousands of people, mainly employed at I.C.I. plants.

Because of the excellent cargo handling facilities and the growing number of regular liner services from Liverpool, the chemical import and export business has thrived through the years and has been remarkably stable. Alongside the modern port installation there has developed an extensive system of inland navigable waterways that include the Trent and Mersey canal connecting the plains of Cheshire with the Mersey at Runcorn and the River Weaver which enters the Manchester Ship Canal below Runcorn. The free use of inland waterways is, of course, an important factor in transport economy. On both banks of the Mersey there are small ports interested in chemicals traffic, the main one being Bromborough which serves the huge soap making factory of Lever Bros. Into the Bromborough Dock arrives cargoes of vegetable oils such as palm kernel, copra and groundnut oil in the West African liners operated by one of the Lever subsidiary companies. On the opposite side of the Mersey is the British Transport Commission's port of Garston, conveniently situated and adequately equipped to handle the raw materials of the south-west Lancashire chemical works.

Garston, where the British Transport Commission has been spending more than £1 million on a quay and cranage improvements scheme, is one of the main inlets for imported sulphur, phosphate rock and other raw chemicals and minerals in bulk. Chemical exports from Garston are mainly bagged fertilisers from Fisons works at Widnes, destined for the Isle of Man and Ireland. A little further up the river lies Widnes, commonly referred to as the home of the heavy chemical industry; but in the main, the export traffic in chemicals passes through the docks at Liverpool and Birkenhead.

Though chemicals form a high percentage of the total manufactured goods through the port of Liverpool, the casual observer at the docks sees little of the specialised aspect of the trade. Unlike London and certain other ports, the port authority imposes few restrictions or regulations on the chemical trade except in respect of hazardous cargoes. This apparently paradoxical state of affairs is due largely to the fact that the port authorities are not responsible for cargo handling over the quay. Stevedoring and porterage is carried out by private companies who are responsible for the safety of the goods shipped. Steps have been taken to draw up and classify a wide range of chemical products with a view to introducing bye-laws for the handling of chemical products within the port, but such is the complexity of the trade that little progress has been made. On the other hand, the products of the petroleum industry come under very carefully drawn up regulations designed to ensure the safety of property and personnel within the handling area.

Allocation of Duties

In the Liverpool Dock system no person is permitted to load or unload or to receive cargo on the quay until he has been duly licensed to act as a master porter or master stevedore and has entered into a bond guaranteeing the due fulfilment of his duties.

The stevedore is responsible for the loading of outward cargoes and the master porter whose work is on the quay is charged with the duty of protecting the cargo from loss, damage or injury and to perform such operations as receiving, sorting or selecting goods to the bill of lading mark, weighing, measuring, marking, scribing, piling or stowing on the quay, trucking, watching, deliveries, etc. For this work he is entitled to make charges specified in the schedule of rates of the Mersey Docks and Harbour Board, and approved by the Ministry of Transport and Civil Aviation. The tonnage rate classifications are for goods in bags and sacks, bales or bundles; in cylinders, drums, barrels, casks, hogsheads, cartons, crates, etc. Where, in accordance with appropriate industrial agreements, a master porter has to pay extra for labour over and above the authorised rate of wages, he can charge a commodity differential. This applies to alkali in bags, bleaching powder in bags or sacks, carbon black in all types of packages, explosives, ethylene dibromide in drums, acetate of lime, acidulated lime, hydrated lime, methyl ethyl ketone, muriate of potash, nitre, phosphorus in drums, salt in bags, soda ash, sodium carbonate, sulphur, zinc powder and many other commodities.

Offloading carbide from Norway at Runcorn, for I.C.I. General Chemicals Division

It has always been the policy of the Docks Board and the associations connected with the trade of the port to reduce the costs of handling as far as possible and to that end great expenditure has been incurred in providing the most modern plant to ensure quick handling. This plant comprises roof and mobile cranes, electric platform trucks, stacking trucks, tractors and lift trucks suitable for bagged goods and pallet loads. Use of pallets for stacking and handling is on a big scale.

Although the movement of chemicals is largely by motor and rail transport, advantage is also taken of the lighterage service provided by small craft for the transfer of goods from dock to dock for transhipment from import to export steamer, or from dock to works possessing facilities for the delivery of waterborne goods. Lighterage is a business which has been considerably handicapped in recent years through severe competition from motor haulage.

One haulage concern whose large fleet of road tankers serves the oil refineries at Stanlow and Heysham, as well as the chemical industries of Lancashire and Cheshire, has its own installation of storage tanks with a total capacity of 630,000 gall. at one of the smaller Liverpool docks. These tanks, 14 of them, provide bulk storage for vegetable and edible oils which are dispatched inland. The tanks have a system of coils and overhead steam piping. The motor tanker vehicles include stainless steel and lined tanks for edible oils and certain chemicals, pressure/vacuum filling and emptying for latex and commodities which need to be handled in this manner, stainless steel tanks with breathers for electrical oils, and so on.

A recent and interesting development is the shipment of liquid caustic soda in bulk from Runcorn to Northern Ireland. Previously caustic soda was shipped in drums to Belfast for delivery to a nylon factory at Carrickfergus. To meet the rising costs an experiment was carried out with a small Spanish tanker—the *Maria Rosa,* a converted water carrier. After equipping the vessel with special fittings to eliminate corrosion, a number of trial runs were made with bulk cargoes of caustic soda. The result of those experiments is the regular employment of the *Maria Rosa* and her crew and a very big reduction in the costs of transportation.

Regular shipments of liquid chlorine from the I.C.I. Castner-Kellner works, Runcorn to the DuPont Company (United Kingdom) Ltd., synthetic rubber plant, Londonderry, Northern Ireland, started in January. The coasting ship *Marwit* has been specially designed to carry the liquid chlorine in tanks forward of the main hold and is regularly engaged in this trade. As the Castner-Kellner works is situated near to the Weaver Navigation Canal, a special berth has been constructed for loading and unloading. On return sailings from Londonderry to Runcorn, the *Marwit* brings neoprene rubber to a depot leased by DuPont at Runcorn.

There is a fair export business in pharmaceuticals and fine chemicals. The Speke factory of Evans Medical Ltd. alone ships well over 1,000 packages each week and this includes kegs and drums containing fine chemicals, which are conveyed to Liverpool or London Docks by vans or trailers.

Fibre Drums

The fibre drums used for fine chemicals have a double Alkathene liner which ensures that the goods remain air tight and will not be subjected to atmospheric conditions. As an extra precaution to ensure that goods are not damaged in transit, some customers specify wooden kegs or steel drums with Alkathene liner, in preference to fibre drums. A few chemical materials attack the polythene liners and in these cases a double crepe kraft liner is normally satisfactory.

Almost every day, special train loads of soda ash and salt arrive at Liverpool from the chemical works of Lancashire and Cheshire. The wagons are distributed to quays throughout the dock estates. Most raw chemicals are bagged and are loaded into the ships holds by sling.

There is also quite a big traffic in non-hazardous liquid chemicals, for instance phenols and octonols, which are brought to Liverpool by road and rail tankers are pumped direct to tanks with a capacity of 30 tons carried on the decks of liners. At destination the liquid is discharged by pumping. Nearly all the big shipping companies adopt this practice and also use deep tanks in the holds of ships for the same type of cargo. Deep tanks can take loads up to 250 tons. When the ships return to port the tanks are thoroughly cleansed.

Although most of the products of the chemical industry of Merseyside destined for overseas are shipped through Liverpool a considerable proportion bound for the Continent leaves the area in specially designed railway wagons belonging to British Railways, via the Harwich-Hook of Holland train ferry services.

British Railways carry a wide variety of chemicals in liquid, solid or granular form, in train loads or in small packages in many different types of vehicles. Bulk liquids are carried in tanks, either privately owned or railway owned, the tanks being fixed, demountable or road-rail. There are some 20,000 rail tanks being operated today about 7,000 by chemical and allied concerns. Bulk movement of solids and powders can be made in covered hopper wagons with a 24-tons carrying capacity and giving gravity discharge through bottom doors; types of traffic include catalyst powder; soda ash; tripolyphosphate; carbon black, and lime. Open hopper wagons, 20-tons carrying capacity and giving gravity discharge through bottom doors, are used for such traffic as potash, ammonium sulphate and limestone. Hop salt wagons, covered hopper wagons, 20-tons capacity, side discharge are used for the bulk conveyance of salt. Presflo wagons, fully fitted wagons of 20-tons capacity gravity loaded through top hatches, discharged by compressed air, can be used for almost any powdered substance.

'L' type containers, which are steel 4-tons capacity partitioned units, with two independent drop doors and one filling hatch, are used for dolomite, ground limestone and salt alumina.

A comparatively recent introduction is a Tote bin, constructed of heavy gauge aluminium alloy, dust and weatherproof, owned by British Railways and hired out to users.

The movement of liquids to the Continent is facilitated by the use of Continental ferry tank wagons, such chemicals as methylchloride, chloroform, trichloroethylene, ethylene dichloride, and caustic potash liquor being sent to various European countries by this means. Other chemicals carried include caustic soda liquor, liquid chlorine, hydrochloric acid, sulphuric acid, ammonia solution, bleaching powder, sodium hypochlorite, chloride of lime and soda ash. Some of the chemicals are of a dangerous nature and special instructions are issued for dealing with these.

Loading chlorobenzene for Italy at Fleetwood Docks

Some idea of the tonnages conveyed by rail can be obtained from the following figures:

Chemicals moved by rail from within the Liverpool Division of British Railways in owners tank wagons total 400,000 tons a year.

Chemicals moved by rail from within the Liverpool Division of British Railways not in owners tank wagons total 100,000 tons a year.

Shipment in Bulk

(*Continued from page 721*)

will not affect the material of construction used for the container.

Solids. The increased use of paper sacks over the last few years has provided a cheap package with a very low tare ratio for solid materials. For export purposes the only improvement in costs that can be effected appears to be shipment in bulk.

In the home trade, however, the intermediate bulk container of between two and four ton capacity can sometimes show economies over paper sacks mainly due to the saving in handling costs. Such containers also lend themselves to specialised purposes where the bin itself provides the final container for transfer of the product direct to a process.

The use of pallets for the movement of paper bags is also well known, as are such devices as paper lined wire crates and similar containers which can be collapsed for the return journey.

Container Ships. The use of specially designed container ships in America has prompted much thought to be given on the same lines in this country. These are vessels specially designed, as are also the containers, to keep handling and, therefore, loading and off-loading time to a minimum. There will obviously be a tendency for this method to be increased due to the present high cost of keeping vessels idle in port during loading and off-loading.

This article has briefly outlined various methods of shipment which may well show economies over what has been done in the past. There is no hard and fast rule and each movement must be investigated as a separate item. Initial problems will always be found when introducing new ideas, but there is no doubt that further developments can be expected leading to increased economies.

Saharan Natural Gas Holds Bright Promise for Europe's Chemical Industry

BRIGHTEST promise for the European petrochemical industry lies in the development of Saharan natural gas which can be expected ultimately to reach an almost all-European distribution. Already there is talk of a pipeline under the Channel to feed the U.K.. This was stated in a paper presented at the 32nd International Congress of Industrial Chemistry held in Barcelona on Wednesday. Co-authors were Mr. Roger Williams, Jr., president, and Mr. Terence D. O'Keeffe, European operations manager, of Roger Williams Technical and Economic Services Inc. The paper, entitled 'European chemicals and world markets', was read by Mr. Dean Spence of the firm's head office, Princeton, N.J.

(The possibility of Saharan natural gas for the U.K. was referred to recently by Mr. G. le B. Diamond, chairman of the West Midlands Gas Board. See also p. 731.

The only great country in Europe besides Italy with large resources of natural gas was France. It seemed, however, that the recoverable Lacq reserves were not as great as originally envisaged and use for fuel was being cut back in favour of chemical uses.

European plastics had a strong grip on world markets; the signs were that exports had been increasing more sharply than those of the U.S. Europe had changed in a short period from a substantial importer of synthetic rubber to an exporter.

Chemicals-from-coal

Production of chemicals from coal derivatives in the U.K., including carbide acetylene, and by fermentation formed roughly two-thirds by weight of the total organic chemicals made in 1954, but by 1959 the proportion was down to about one-half and it might drop to less than one-third by 1965.

The conversion started later in Germany, but while that country was still second in tonnage output of petrochemicals, the average annual rate of increase had been greater even than in the U.K. Production growth was not expected to continue at the same high rate. Progress in France had been more spectacular on a relative scale.

While aromatics comprised about 10% of U.S. petrochemical output, European petrochemicals were still predominantly aliphatic. Trends in the U.K. were leading to the abandonement of the rule of thumb: aromatics = coal; and aliphatics = oil.

It seemed that petrochemicals would increasingly become the base for acetylene and in West Germany it was estimated that by 1962-63 as much as 50% of acetylene would be oil-based.

With Europe emerging as a more formidable competitor in world markets, U.S. firms might well move towards more vertical integration to protect their large domestic investments. A further move by raw material suppliers might be to 'tie' consumers. A straw in the wind here might be the recent arrangement between the Sulphur Export Corporation of the U.S. and Gouldings of Dublin for the production of sulphuric acid in Eire with the new venture, Sulphac.

The authors next discussed trade with less developed countries where business was likely to build up in heavy organics and inorganics, plus aid with supplying know-how and plant for fertiliser production. Smaller countries with a high standard of living, like New Zealand, were likely to continue to import chemicals. The call was for the packaged chemical plant. With a need to spread engineering costs (about 30% of the total in any plant) the effective outcome was that the minimum economic unit was smaller where package plants were available than when plants had to be engineered.

Dealing with Eastern-bloc trade, Rogers and O'Keeffe said it was by no means sure that costs in Russia and China for comparable goods were higher than those in West Europe. The strides made in those countries had been so great and the standards of living so low that it could well be that the Russians and Chinese were making profits when exporting at lower prices than those of their European competitors.

European missions to Russia in the last two or three years had learned that the system of prices and wages was so adjusted as to leave unskilled and lower-paid workers in general barely able to cover the minimum cost of subsistence. One outcome of this which had been too little stressed was that capital could be accumulated by the State for investment in industry on a scale and at a rate in excess of what seems possible in West Europe.

In fact it could well be that Russia was today accumulating capital at a rate quite unknown in the history of any other major country.

Tours of East and West Europe Bring Orders for Burtonwood Engineering

ORDERS worth £126,000 have been received in the last three weeks, following a tour of Russia and Western Europe by Mr. H. V. Rowlands, newly appointed sales director of Burtonwood Engineering Co. Ltd., of Warrington, Lancs.

Mr. Rowlands said, on his return from Russia, "We had a most encouraging trip. Not only did we secure orders for granulators, but there is every possibility of selling extruders and ancillary equipment".

W. European Orders

Turning his attention to the other side of the Iron Curtain, Mr. Rowlands immediately set off on a tour of Italy, Holland and France, where he obtained substantial orders for plastics equipment from two large Italian chemical companies. From a Dutch chemical company, who are carrying out extensions to their synthetic rubber plant, he received orders to the value of £26,000 for supplying equipment which has not previously been built in the U.K.

Burtonwood were acquired in October 1959 by U.S. Industries Incorporated (Great Britain) Ltd. and now have greater opportunities of exporting to the U.S. through the widespread organisation of U.S. Industries, one of the 300 largest American corporations.

Orders received recently from the other side of the Atlantic include one from the U.S. for the manufacture of filter packs to be used on a new polyester fibre plant under construction in North Carolina and another for a polythene plant being built in Mexico.

It is anticipated that all outstanding orders will be completed by March 1961.

First Uranium Delivery for Bradwell Power Plant

DELIVERIES of uranium for the Bradwell-on-Sea atomic power station started on 24 October. It is being brought in small consignments by road from the Atomic Energy Authority's factory at Springfields, Lancs., where fuel elements for all the Central Electricity Generating Board's nuclear power stations are being made.

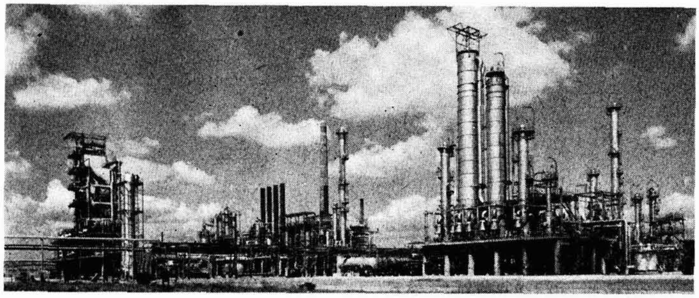
By next March there will be several hundred tons of natural uranium fuel at the Bradwell site and the loading operation on the first of the station's two nuclear reactors will start. The reactor will become critical in June. During the summer the first half of the station will be commissioned; about six months later the whole installation will be producing a total of some 300 mW which will be fed into the national grid.

Part 5 of Scientific Russian Without Tears

Owing to pressure on editorial space this week 'Part 5, Vocabulary' of 'Scientific Russian Without Tears' has had to be held over until our next issue.

£25 MILLION EXPANSION AT CARRINGTON

Covers New Facilities for Polyolefins and Rubber, Plus Revamping of Older Plants



General view of new extensions at Carrington showing the styrene monomer plant (right) and the second ethylene unit

A VAST expansion scheme at the Carrington works of Shell Chemical Co. Ltd. involves new facilities for olefins, intermediates, plastics materials and synthetic rubber. With a current naphtha throughput of 250,000 tons a year—to be raised to 450,000 tons in 1962—industrial chemicals produced at Carrington this year will amount to 140,000 tons. Of this total, production of ethylene oxide and propylene oxide and derivatives, and aromatics will total about 55,000 tons.

So far this year, a second ethylene unit, built by Kellogg International, has just been brought into production with an ultimate capacity of 55,000 tons a year, together with a Matthew Hall-constructed ethyl benzene and styrene monomer unit. Other recent additions to Carrington facilities include the Shell direct oxidation ethylene plant—the first of its kind in the U.K., and extensions to the polyethylene glycol plant.

In hand and due for completion next year are the polyolefins plant comprising polypropylene and low-pressure polythene and a separate high-pressure polythene unit. Work is also in hand on the No. 1 ethylene fractionation unit, involving dismantling the 'cold boxes' and replacing them with low-temperature distillation columns. With Lummus as contractors, this work will take between 18 and 24 months. When completed, naphtha throughout will be boosted to 450,000 tons a year.

Planned for completion by 1963 are units for polybutadiene and polyisoprene. Butadiene will also be made at Carrington and, possibly, isoprene.

Since Shell acquired the Carrington facilities in 1955, they have invested £25 million there; a further £25 million or so will be spent over the next four or five years, mainly on polyolefins and synthetic rubber.

Shell Chemical have an 850-acre site at Carrington of which 200 acres are in a 'green belt'. About 250 acres have been developed and a further 250 acres are under development. Total labour force is about 3,000 and this will rise to some 4,500 by 1964. In addition some 1,800 contractors' men are on site, mainly working on the polyolefins plants. About 200 graduate chemists and engineers are employed at Carrington.

Of the 140,000 tons of products, 30% or more will be exported this year, not including intermediates that are sold to other U.K. chemical companies for export by them after further processing.

Ethylene Production. Crude naphtha is piped from the Shell Stanlow refinery. The first naphtha cracker, installed by Petrochemicals Ltd. before the company was acquired by Shell Chemical, uses the Catarole process. Originally a catalytic process involving 40 passes, this has now been modified to a two-pass process and the use of catalyst replaced by straight thermal cracking. A feature of the furnaces is a long residence time which gives a good ethylene yield, also producing easily refined liquid fractions containing aromatics.

The cracker gas stream—comprising hydrogen, methane, ethane, ethylene, propane, propylene, butanes, butylenes and small amounts of heavier hydrocarbon gases—is purified for removal of traces of acid gases. Following compression, it is passed to the separation unit. On the first ethylene unit, this was carried out in the 'cold box' type of unit which is now being dismantled. Until this is completed fractionation of the stream from the Catarole cracker will be carried out on the second ethylene unit.

Following separation, the main products, ethylene and propylene, are piped to other parts of the plant. Excess gas not needed for chemical conversion or for fuel purposes is supplied to the gas works (30,000 tons/year). By using feedstock excess to current chemical requirements as a fuel, the Carrington works are almost self-sufficient in regard to fuel supplies.

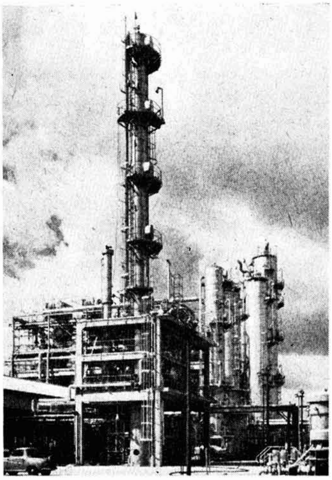
The new and much larger second ethylene unit was needed to meet the very large increases in demand for ethylene and propylene due to the expanding product programme. Naphtha is cracked in Kellogg steam cracking furnaces, using a very low steam to naphtha ratio for optimum yields at minimum operating costs. To increase the economy of operations, effluent from the cracking furnaces is quenched in Dowtherm exchangers and subsequently, scrubbed with gas oil to remove entrained polymers and solids. The hot Dowtherm is used to generate medium pressure steam. After separation of the heavy ends, the remaining gas is subjected to water and caustic wash, drying, and acetylene removal before passing to the low temperature separation section for recovery of ethylene and other fractions. Gas separation section uses free-standing columns that operate at higher pressures and temperatures than in the 'cold boxes.'

Refrigeration is accomplished using ethylene and propylene as refrigerants, three temperature levels being used in each case, the lowest level being −150°F. A further degree of cooling is obtained by utilisation of the Joule-Thompson effect in the demethaniser. An extensive heat exchange system is employed to keep the refrigeration load to a minimum and thus keep operating cost low.

Ethylene Oxide. Two methods of making ethylene oxide can be used at Carrington. The first and older process involves a chlorhydrin unit, but this is now being increasingly used for propylene oxide following the start up some 12 months ago of the Shell direct oxidation plant. Here ethylene reacts with oxygen in the presence of a silver catalyst to yield a gaseous mixture from which pure EO is recovered by absorption and distillation. Gaseous oxygen is supplied by a Linde-type air separation plant. The reaction is exothermic and the correct temperature in the three reactors is maintained by circulating a special hydrocarbon coolant through them. The gaseous product from the reactors is first cooled in a heat exchanger by the incoming gas and further cooled by quenching with a mild alkali solution. Carbon dioxide formed is removed by absorption. Finally, gaseous ethylene oxide is absorbed in water to yield a dilute solution that is passed to a series of distillation columns, where EO is recovered and trace impurities removed.

The direct oxidation plant, constructed by the Lummus Co., has been on stream for about 12 months and has a rated capacity of 25,000 tons a year.

Mono-, di-, and triethylene glycol and polyethylene glycols are among the



Direct oxidation ethylene plant

most important of the Carrington products. Hydration produces a weak solution of a mixture of the glycols in water which is first concentrated by a multiple effect evaporation system and then separated into its pure components by further distillation. Higher molecular weight polyethylene glycols are made batchwise by condensation of EO and ethylene glycol over a catalyst. The plant, comprising two six-ton reactors, was started up in May 1959 and was recently extended by the addition of two further six-ton reactors. A similar process is used for the production of polypropylene glycols, demand of which is increasing with the growth of the polyurethane foam trade.

Aromatics. The low-boiling liquid stream from the cracking operations is fractionated in a light aromatics distillation plant to produce crude fractions which are further treated to produce high-purity toluene and benzene. Crude naphthalene, was originally produced from pitch via the Catarole cracker, but production was ceased some years ago. The recent U.S. steel strike which helped bring about a universal shortage of naphthalene saw the restart of operations. Naphthalene is crystallised out, centrifuged and sold as crude product; output amounts to a few hundred tons a year. Another by-product of pitch is pure di-cyclopentadiene. The pitch, of low sulphur and ash content is used in the production of metallurgical carbon electrodes.

The aromatic stream also contains 'xylostyrene,' a mixture of xylenes and styrene, which is used for the production of resins for floor tiles and for use by Styrene Co-Polymers Ltd. in paint formulations. No attempt is made to recover xylenes as such for these are produced at Stanlow. Output of 'xylostyrene' amounts to about 2,000 tons/year.

Styrene and Ethyl Benzene. The new styrene monomer plant produces ethyl benzene, with a complex of aluminium trichloride used as a catalyst. After careful purification, the ethyl benzene is vaporised and injected into highly superheated steam. The mixture is passed over a solid catalyst, where part of the ethyl benzene decomposes into styrene and hydrogen. The gas fraction is purified and separated and the styrene purified.

Ethyl benzene capacity is 35,000 tons/year and that of styrene 18,000 tons. Carrington is self-supporting in styrene monomer, but not for benzene, some nitration-grade benzene being imported from Shell plants in the U.S. Some ethyl benzene is piped to Stanlow and some goes to Shell Haven for the production of detergent alkylate. The ethyl benzene and styrene monomer plants are said to have lived up to design capacities and the evidence is that they are operating at above the designed rates.

For polystyrene, the monomer is polymerised in batch reaction pressure kettles in an aqueous suspension process and the resulting beads are separated, washed and dried. Two associated products are styrene/acrylonitrile copolymer and Styrocell expanded polystyrene. A special unit handles production of the foamed product.

Polyolefins. The polyolefins plant, now under construction by Matthew Hall and George Wimpey, will produce 15,000 tons a year of low-pressure polythene or polypropylene—design allowing flexibility of product, according to market demand. A semi-commercial plant, which has since 1958 produced at the rate of 1,000 tons a year, has enabled a thorough testing of the market. The Carrington Research Laboratory has recently established a smaller pilot plant with a capacity of a few hundred tons a year.

A Shell development of the Ziegler organo-metallic catalysts for polyolefins is being produced on a small scale and production will be stepped before the polyolefins plants are fully operational.

A third polyolefin plant, also under construction and due for completion next year, will produce 15,000 tons a year of high-pressure polythene. This is based on the Badische Anilin und Soda Fabrik process, which is currently being operated by a jointly-owned B.A.S.F.-Shell company in West Germany—Rheinische Olefine Werke.

Polydiene Rubbers. Production of polybutadiene and polyisoprene rubbers, which started earlier this month at the Shell Chemical Torrance, California, plant, is also planned at Carrington. Site preparation will start next year, with completion scheduled for 1963. Contractors have not yet been appointed. The facilities will include a butadiene plant, using feedstock from the second ethylene plant. Carrington is not self-supporting in a C_5 stream and plans for an isoprene plant are not yet settled. Some could come from Carrington or from Stanlow.

Research. Aim of the 17 research laboratories of the Shell Group throughout the world is not to duplicate research, but to allocate work on projects for which each is best suited. A new plastics research laboratory and pilot plant is due to be opened at Carrington by the end of 1960.

The Carrington Research Laboratory is currently mainly working on projects in an advanced stage of development and planned for immediate commercial operation. A considerable effort is also devoted to improving the economics of existing operations and to improving product quality. Exploratory work is in hand on new products.

A large part of the effort is deployed on the development of polyolefins by low-pressure techniques. In the polystyrene field, work continues on the development and production of new and improved grades. A substantial and increasing effort is also devoted to alkylene oxide. Polythene monofilament is the work of a separate section.

Permutit Produce First British Film on Ion Exchange

IN recent years interest in ion exchange has grown rapidly and consequently the amount of literature on the subject has also grown, but the cine film—the ideal instructional medium—has so far been neglected. However, the Permutit Co. Ltd. have now produced a 16 mm. instructional film in sound and colour which will form an introduction to the subject, both for students and potential industrial users. Running time is 27 minutes.

The film opens with a rapid survey of the uses of ion exchange in industry and research. Then, with the use of molecular models, the structure of ion exchange resins is examined. Two of the most frequently used types—the strong acid cation exchanger and the strong base anion exchanger—are shown: the models illustrate the incorporation of the active groups into the polystyrene network, and the inter-relation of the fixed and mobile ions with the resin skeleton.

A description is then given of the three major principles on which all ion exchange applications are based—those of separation, substitution and removal of ions. Demineralisation of a copper dichromate solution is considered in detail in order to explain the basis of the ion exchange technique. Animated diagrams are used alternatively with column experiments to show what is happening both in solution and inside the resin beads.

The principles of two bed and mixed bed demineralising are illustrated, both in the laboratory and on industrial scale, and examples are given of the uses of demineralised water in industry.

£50 Million Expansion at Leuna Werke

Exclusive 'Chemical Age' Interview

At Dr. Pobloth's London hotel, l. to r., H. McC. Buckler, contracts manager for the Leuna project of Humphreys and Glasgow Ltd., Dr. Pobloth and H. S. Grunewald, contract design engineer for Humphreys and Glasgow

CURRENT expansion projects in hand or planned at the vast East German Leuna Works, and in which Humphreys and Glasgow Ltd., the London contracting and chemical engineering company, will play a major part, will cost about £50 million. This was stated by Dr. Helmut Pobloth, head of the Department of Petrochemicals of VEB Leuna-Werke 'Walter Ulbricht' of Leuna, in an exclusive interview with CHEMICAL AGE at his London hotel last week.

Dr. Pobloth had been visiting the London firm for consultations on the £4 million ethylene project which it is handling for the East German works. He returned to Leuna on the day following the interview, 20 October.

Under the East German Government's seven year plan (1958-1965), Leuna will construct a two-stage ethylene project. The first stage, a fuel cracker to be designed and engineered by Lurgi of Frankfurt, is due for completion in 1962-63. The second stage contract for design and detailed engineering was awarded to Humphreys and Glasgow earlier this year (CHEMICAL AGE, 27 February 1960). They will use the thermal cracking process licensed to them by Petrocarbon Developments Ltd. This is a development of the ethylene cracker engineered by Petrocarbon for Petrochemicals Ltd., before the latter company was acquired by Shell Chemical. Each stage of the Leuna ethylene project will have an output of 40,000 tonnes a year, making a total capacity of 80,000 tonnes.

Design Well Advanced

Design of the second stage is well advanced, but construction is being delayed at the request of Leuna so that it dovetails with the State's overall manufacturing programme. The gas separation plant should be completed in about four years.

This is the first time that a British chemical engineering concern has provided know-how and design for an olefin plant outside the U.K. and is also the first U.K. contract for a complete chemical plant for East Germany. Of his association with Humphreys and Glasgow, Dr. Pobloth said "We are very pleased with our talks. We have had a very good service from the company."

The chemical section of the East German Republic's industrial programme involves the construction of three large works. Firstly, there is a refinery at Schwedt-am-Oder with a 6 million tonnes-a-year throughput of crude oil; oil will be piped from the Soviet Union. The second major project involves the Leuna works and includes the ethylene facilities, while the third works will be at Guben on the Polish border. Here spinning units will be constructed for the manufacture of Dederon nylon and synthetic fibres, including acrylics. There are no plans at present for the production of polyester fibres.

Dr. Pobloth stated that about half of the ethylene production at Leuna will be used for the production of polythene and half piped to the large Chemische Werke Buna at Schopel for the production of styrene as a material for synthetic rubber. One of the world's first synthetic rubber units, Buna was in production as early as 1936.

H.P. Polythene

Leuna are currently negotiating a contract for the production of polythene by the high-pressure process. Capacity will be between 30,000 and 40,000 tonnes/year. It is also intended to produce low-pressure polythene, but on a smaller scale with an output of around 10,000 tonnes/year. For L.P. polythene, Leuna have developed their own process over the last 10 years; in principle it follows the Ziegler/Montecatini processes. Polypropylene will be produced after 1965.

Natural phenol, now produced at Leuna mainly for caprolactam, is based on lignite tar extraction. (This process was described in CHEMICAL AGE, 9 January, p. 63.) The second phenol stage will produce a synthesis product via benzene and propylene, thence by oxidation to cumene hydroperoxide and by cracking this to give phenol and acetone. Resembling the well-known Distillers Company cumene-phenol process, this technique was developed in the Soviet Union, which will provide design and engineering for the plant. Construction will be handled by Leuna Werke. 1965 phenol capacity is scheduled at 25,000 tonnes.

Dr. Pobloth hinted that a third phenol route may well be a direct oxidation from benzene (work is in hand on such a process in the West as well as in Eastern countries), or by some other process.

Phenol will be used for the production at Leuna of caprolactam monomer, necessary for the manufacture of Dederon nylon, based on a process developed in Leuna during the war. It is planned to produce 25,000 tonnes a year of caprolactam, a total which may be raised eventually to 35,000 tonnes. Dederon output now stands at 10,000 tonnes/year and this is to be increased to 30,000 tonnes by 1965.

For the Leuna projects it is intended to use as much East German-made plant and equipment as possible. Considerable imports will be necessary, however, and for their ethylene project Humphreys and Glasgow will be procuring much equipment in the U.K., particularly control instruments. Because of a lack of materials in East Germany, much of the highly specialised plant and equipment for the high-pressure polythene plant will also be imported.

The Leuna Werke cover a vast site, some three miles long, and employ a labour force of about 30,000. Accent in the new installations will be on automatic control, keeping labour needs to a minimum. Some 350 different products are currently made at Leuna, ranging from a relatively minor interest in pharmaceuticals, to gasoline produced by hydrogenation and ammonium sulphate, the main product.

Synthesis Ammonia

Synthesis ammonia output at Leuna totals 1,100 tonnes a day, or some 400,000 tonnes a year. The first synthesis ammonia unit went on stream in 1916 with an initial output of 100,000 tonnes a year. Using the Haber-Bosch process, the huge plant was constructed in 12 months.

Dr. Pobloth travels a great deal in neighbouring countries, particularly in connection with the Leuna expansion projects. With their great chemical industry tradition and experience, Leuna also provide much technical assistance and know-how to other Eastern bloc countries. A chemist by training, Dr. Pobloth studied at Leipzig University, where he lectured until 1940 when he joined Leuna, where he has been ever since.

London I.Chem.E. Symposium on Adsorption Processes

INVESTIGATIONS on the performance of a commercial-scale plant for the recovery of organic solvents in the liquid phase by the use of activated carbon, and the development of an automatically operated continuous plant, were described by Mr. A. Bryan (Sutcliffe, Speakman and Co. Ltd.) at a symposium on 'Adsorption in industry' held by the Graduates and Students Section of the Institution of Chemical Engineers in London on 20-21 October.

Activated carbon was also used for a plant, described by Mr. M. J. Hagger (British Celanese Ltd.) which recovered 90% of the carbon disulphide in the ventilating air extracted from a viscose rayon staple fibre plant. The plant comprised an adsorption section, using activated carbon in a continuous counter-current fluid-bed adsorber, and a regeneration section, which kept the carbon activiated at an economic level by continuously treating a side-stream from the main carbon circulation. The carbon was regenerated by steaming.

Much interest was attached to a paper outlining the industrial uses of molecular sieves, by Mr. J. F. Edwards (Union Carbide Ltd.), while lessons could be drawn from experiences with a plant using activated charcoal in the treatment of trade wastes, described by Dr. D. H. Sharp (Fisons Ltd.). Mr. S. Ruhemann (A.E.I.-Birlec Ltd.) gave his audience an insight into the complex problems which lie beyond the design of such outwardly simple equipment as industrial air and gas dryers.

Other papers presented were by Mr. C. P. Williamson (British Petroleum (Kent) Ltd.) on the use of chromatography for process control, and an introductory paper on the principles of adsorption by Mr. J. W. Armond (British Oxygen Research and Development Ltd.)

Chairmen of the symposium on the two days were Mr. G. U. Hopton (North Thames Gas Board) and Mr. E. S. Sellers (B.P. Research Centre), respectively.

Tough Plastics Ship Fume Scrubbing Tower to Germany

SOMETHING unusual in plastics fabrication was called for in an order for a fume scrubbing tower received by Tough Plastics Ltd., Addlestone, Surrey, this tower being for installation at Electrochemische Werke, Munich. The specification was particularly rigorous, calling for high corrosion resistance at higher than normal temperatures coupled with strength and lightness. It is stated that chemical research established the Tufplas method of bonding as being the only way of producing a suitable material of construction. The material is unplasticised p.v.c., chemically bonded polyester resin glass fibre mat.

The fume scrubbing tower is one of a number of similar fabrications that have been ordered from the Continent.

Footnote: To ensure safe and speedy delivery of the fume scrubbing tower the company sent one of their own vehicles, driven by a technical representative with his wife—they were on honeymoon—all the way from the works near Weybridge to the site at Munich.

The fume scrubbing tower sets off for Munich

Q.V.F. Form Canadian Subsidiary

A CANADIAN subsidiary, with premises at Scarborough, near Toronto, has been formed by Q.V.F. Ltd., Stone, Staffs, as a result of developing sales of industrial glassware to Canada. Resident manager of Q.V.F. Glass (Canada) Ltd. will be Mr. L. Pate. Directors are Mr. B. H. Turpin (chairman), Mr. I. W. Bigham, Mr. J. G. Window. Mr. Window is sales director of the British parent company.

New Safe, Effective Solvent from Dow

A NEW solvent, Clorothene NU, which is an improved inhibited grade of 1. 1, 1-trichloroethane, has been introduced by the Dow Chemical Co. Ltd. The solvent is to be marketed in this country by Penetone-Paripan Ltd., Egham, Surrey, who will be sole selling agents in the U.K.

Chlorothene NU, with flammable properties similar to those of trichloroethylene, has no flash or fire point, and with solvent properties closely parallel to those of carbon tetrachloride can be used for cleaning materials contaminated with greases, tars, oil and waxes. It is suitable for dip, spray, slush and wipe cleaning and may be used on electrical apparatus such as generators, motors or printed circuits without leaving a film liable to cause tracking.

Dow say that Chlorothene NU can be used on such corrosion sensitive materials as aluminium, zinc and white metal, in addition to many plastics and rubbers.

Because of its low toxicity (the permissible concentration of 1,1,1-trichloroethane is 500 p.p.m.), Chlorothene NU can be used safely in all cleaning processes, including those in confined spaces.

Impact of Tonnage Oxygen on Steelmaking

THE advent of relatively cheap oxygen in bulk is revolutionising steelmaking throughout the world and eight high-purity tonnage oxygen plants are already in operation in the iron and steel industry with a daily capacity of 1,125 tons. Orders have been placed for additional plants with a capacity of 1,775 tons/day of high-purity oxygen and 630 tons/day of 90% purity oxygen, all of which are expected to be in operation by the middle of 1962. Negotiations for further plants are at present being conducted.

According to *Steel Review*, journal of the British Iron and Steel Federation, one can reasonably forecast that by the mid-1960's the total oxygen consumption of the steel industry for all purposes will rise to 5,000 tons/day or 1.8 million tons/year.

U.K.—Finnish Venture for Multiwall Sacks

BY the end of the year, the new multiwall sack plant of Papropack Ltd. will be in operation at Hull. Papropack is a joint venture by two jute sack manufacturing and selling groups and a Finnish paper concern. The Scandinavian partner, W. Rosenlew and Co. AB, will provide the new company with a direct source of high quality kraft. Through Robertson Industrial Textiles Ltd. and Mid Wynd Holding Co. Ltd., the parent companies of the jute groups, Papropack will have an extensive sales organisation at their disposal.

Papropack will operate from a new factory which is being built at Hull. The company's chief executive will be Mr. G. M. Hobday.

Bookshelf

CHEMICAL PROCESSES IN THE NUCLEAR ENERGY FIELD

PROGRESS IN NUCLEAR ENERGY. SERIES III. PROCESS CHEMISTRY VOL. 2. Edited by *F. R. Bruce, J. M. Fletcher* and *H. H. Hyman*. Pergamon Press London, 1958. Pp. ix + 579. £5 10s.

Recently, several very good books reviewing the chemistry of nuclear reactor systems have been published. This volume, however, is a continuation of a work which has a much deeper intent. It belongs to a series started under the impetus of the First Geneva Conference with the purpose of digesting the tremendous quantity of published material and publishing authoritative reports on the different aspects of 'Progress in Nuclear Energy'.

Obviously solvent extraction chemistry and processes feature prominently. Topics range from a review of laboratory mixer settlers, through a study of uranium extraction from sulphate rather than nitrate ore leach liquors to the Redox process (hexone solvent) for irradiated fuels. American and British work on the effect of radiation induced degradation products from TBP and its diluent and other impurities is described.

Three interesting papers are concerned with the continuous preparation of uranium fluorides, while a number of other process possibilities are discussed including the use of semi-permeable ion-exchange resin membranes in an electrolytic process for ore purification; electro-refining for a degree of decontamination; use of amalgams for decontamination and another almagam process for the purification and production of massive thorium metal. Other papers are concerned with: the preparation of plutonium metal from the nitrate; purification of zirconium free from its natural hafnium contaminant; recovery, for tracer studies, of Th^{230} relatively free from Th^{232} from residues of the initial uranium purification; the value of ion exchange in achieving concentration and purification from dilute solutions with losses of fissionable material less than 0.01%; and the recovery of valuable by-products from the irradiated fuels. One section is devoted to aspects of the segregation and containment of wastes.

This entire review is not long enough to list the titles of the 50 papers and sectional introductions, or hardly to list the titles of the six appendices which present a great deal of relevant physical property and solvent extraction data in a very convenient form. However, it must suffice to indicate the range of the contents of this second volume.

J. S. M. BOTTERILL

Gas Chromatography

GAS CHROMATOGRAPHY ABSTRACTS 1959. Edited by *C. E. H. Knapman* and *C. G. Scott*. Butterworths, London, 1960. Pp. x + 164. 42s.

This book is the second of the series of gas chromatography abstracts to be published under the auspices of the Gas Chromatography Discussion Group of the Institute of Petroleum. 717 abstracts of papers published during 1959 are given. The arrangement follows that established for the first volume. Each paper is noticed by title, authors, reference and a five to ten line summary of its contents. There is a detailed analytical subject index of 34 pages and an author index.

Physical Chemistry

ANNUAL REVIEW OF PHYSICAL CHEMISTRY, VOL. 11. Edited by *H. Eyring*. Annual Reviews Inc., Palo Alto, 1960. Pp. viii + 588. $7.

The latest volume in this excellent and indispensable series contains 21 articles on major fields of physical chemistry written by acknowledged authorities. Most of the writers are American, but four are European. Each article covers the literature on the chosen topic up to the end of November 1959, and has about 200 references. In addition to complete author and subject indices this volume contains cumulative indexes of chapter titles and contributing authors for the previous volumes. The article by S. A. Rice and H. L. Frisch on 'Some Aspects of the Statistical Theory of Transport', is of exceptional length (86 pages) and covers work published over several years.

Thermodynamics

PRINCIPLES OF CHEMICAL THERMODYNAMICS. By *Charles E. Reid*. Chapman and Hall, London, 1960. Pp. xii + 306. 63s.

This is a Reinhold physical and inorganic chemistry text, and as such an introductory volume suitable for courses up to and including the Honours B.Sc. level.

Little space is taken by introductory material: the Second Law appears on page 19 and the Third Law on page 93. A chapter on statistical thermodynamics is followed by ones on solutions, phase equilibria, electrochemistry and surfaces. Systematic methods of deriving thermodynamic relations form another chapter and a number of theoretical and mathematical points are dealt with in appendices. A feature of the presentation is that thermodynamic treatment is illustrated by its application to particular models: thus non-ideal gases and the principle of corresponding states are introduced, as well as bond-energies and lattice energies of crystals: the Debye-Hückel relations for activities are deduced and used in the exposition of electrolytes. Such features will markedly contribute to the student's appreciation of formal thermodynamic procedures. There are problems for each chapter.

Despite the many alternatives, those teaching chemical thermodynamics would be well advised to consider this volume for their courses.

Vacuum Technique

PROGRESS IN VACUUM SCIENCE AND TECHNOLOGY. Edited by *A. S. D. Barrett*, Pergamon Press, London, 1960. Pp. 160. 70s.

This volume, the title of which the reviewer felt to be rather misleading, consists of a reasoned plea for more education in vacuum practice in technical colleges and universities in the U.K., followed by a series of six review articles on general vacuum technology. It has been issued as a supplement to subscribers of the journal *Vacuum* and is now offered to the general public at 70s. In a sense this volume is preaching to the converted. Appreciation of the importance of vacuum technique and vacuum technology is widespread. The real trouble is to know how to fit in teaching in this field together with all the multifarious techniques which must now be taught to physicists, chemists and engineers.

The chapters on vacuum technology are interesting surveys, copiously illustrated with photographs and diagrams. Topics discussed are: vacuum and gettering problems in the valve industry, vacuum metallurgy in the U.S., vacuum fumigation, vacuum drying and molecular distillation. There is no index.

R. C. PINK

New Bookshelf Scheme to Speed Reviews

A revised scheme of book reviews has been introduced to improve the value of our Bookshelf feature to readers. To overcome what have been unavoidable delays in publishing lengthy reviews of books, future reviews will be more concise giving vital details and comments by a panel of experts as to the value of the books.

The aim will be to feature reviews very shortly after publication, thereby giving an expert opinion to potential buyers, rather than to publish a more lengthy review of a book that many readers will probably already have purchased. Until the scheme is fully operational, reviews commissioned earlier will also be included.

Bookshelf (contd.)

REVIEW OF FACT AND THEORY IN PROTON CHEMISTRY

THE PROTON IN CHEMISTRY. By *R. P. Bell*, Methuen, London, 1959. Pp. vii + 223. 42s.

All too frequently a book based upon a series of lectures fails as a contribution to scientific literature. Dr. Bell's monograph is a delightful exception to the norm. In it he presents a lucid and logically developed account of the equilibrium and kinetics properties of the hydrogen ion in solutions of all ranges of concentration. In aspects where information is in plenty a clear summary of fact and theory is presented; where information is sparse and investigations are incomplete the difficulties and omissions of the work are discussed and the present state of knowledge is critically reviewed. The book is readable, well presented and the rare misprints will undoubtedly be corrected in later editions.

This book is to be recommended to workers in the field of proton chemistry where such a text has been lacking. Moreover, its substance is not so specialised as the title implies, for workers in allied fields will find reading the contents a salutary exercise.

D. A. PANTONY

Chemical History

CHYMIA, VOL. 6. Edited by *H. M. Leicester*. Pennsylvania University Press, London; O.U.P, 1960. Pp. x + 200. 40s.

This member of the series of annual studies in the history of chemistry contains articles on Akkadian texts on perfumery and early Muslim chemistry (Levey, 9 and 7 pages), Black's lectures (Partington, 41 pages), G.-F. Fouelle (Rappaport, 34 pages), Sir Humphrey Davy's poetry (Fulmer, 25 pages), Rydberg (Sister St. John Nepomucene, 19 pages), Tswett (Robinson, 16 pages), Chemists and the oceans (Goldberg, 18 pages), Jorgensen (Kauffman, 25 pages). Each is a scholarly well-documented article, which would be read with profit and pleasure by any chemist. The extended accounts provide an antidote to the potted biographies that get handed down from one textbook to another.

Science of Matter

STRUCTURE AND CHANGE, AN INTRODUCTION TO THE SCIENCE OF MATTER. By *G. S. Christiansen* and *P. H. Garrett*. W. H. Freeman, London, 1960. Pp. xv + 608. 63s.

The authors state that the object of the book is to introduce the student to the scientific view of the physical world, they offer a 'mechanical', an 'electrical' and a 'modern' view. In the large pages with double columns they present much information in a novel way without using more than the simplest algebra. They are aided by 487 carefully planned drawings. The book which is written as a text complete with questions at the end of the chapter is intended as a 'cultural' scientific course for the older reader. They have the U.S. college student in mind. Most of the material would be familiar to a sixth-form science scholarship candidate in chemistry and physics in this country. He would probably regard the treatment as amateur (which the authors intend) but would profit from the original presentation.

Catalysis

CATALYSIS VOL. 7. Edited by *P. H. Emmett*. Reinhold Publishing Corp., New York; Chapman and Hall, London, 1960. Pp. vi + 378. 108s.

The book contains six chapters: Cracking catalysts by L. B. Ryland, M. W. Tamele, and J. N. Wilson (91 pages); Catalytic dehydration and hydration by M. E. Winfield (90 pages); and four chapters by J. K. Dixon and J. E. Longfield: Hydrocarbon oxidation (98 pages); Oxidation of ammonia, ammonia and methane, carbon monoxide and sulphur dioxide (66 pages); Mechanism of catalytic oxidation (16 pages); and Miscellaneous catalytic oxidations (5 pages). It also includes an author index and subject index and, in keeping with the other volumes of the series, provides an invaluable reference source and review series on the physical chemistry of catalysis and catalytic processing. This volume completes the work. No index covering all seven volumes has yet been published.

Non-Newtonian Fluids

NON-NEWTONIAN FLUIDS. By *W. L. Wilkinson*. Pergamon Press, London, 1959. Pp. xiv + 138. 37s 6d.

After a brief introduction to Newtonian and non-Newtonian fluids, this book deals with the classification of the latter group in Chapter 1. This includes a discussion on Bingham bodies pseudoplastics and dilatant fluids and mechanical analogies to viscoelastic fluids such as the Voigt and Maxwell bodies.

Chapter 2 deals with the experimental methods of characterisation of non-Newtonian fluids. It covers the various types of viscometers which are used for different purposes and frequency response methods. Throughput-pressure drop relationships form the basis of Chapter 3, for both laminar and turbulent flow. This section includes some treatment of the extrusion and rolling of plastic materials.

The next chapter deals with heat transfer characteristics, again in relation to both laminar and turbulent flow, and also includes a discussion on heat transfer and skin friction in relation to the Reynolds and Taylor-Prandtl analogies. Chapters 5 and 6 cover the mixing characteristics of non-Newtonian fluids, and viscometric measurements and apparatus respectively.

At the end of the book there are two appendices dealing with the mathematics of the effective slip of non-Newtonian fluids near a solid boundary, and the basic equations of a coaxial cylinder viscometer.

E. J. CHARLES

X-Rays in Analysis

X-RAY POWDER PHOTOGRAPHY IN INORGANIC CHEMISTRY. By *R. W. M. D'Eye* and *E. Wait*. Butterworths, London, 1960. Pp. viii + 222. 45s.

Chemists have long accepted X-ray structural analysis but have been surprisingly slow to take advantage of X-ray diffraction patterns for identification purposes. This volume provides an excellent systematic account of current techniques, a good deal of it perhaps too specialised for those starting up in the subject. It will, in fact, be read with interest by most X-ray diffraction workers. There are lucid chapters on generation of X-rays; cameras; powder photographs; cell dimensions; crystallographic theory; intensities; applications.

It is unfortunate that the essential simplicity of some of the methods is not illustrated before the final chapter and many chemists might wish for and benefit from a fuller account of qualitative analytical procedure (pp. 173-176). The polymer and fibre field is omitted by the restriction to inorganic powder diffraction.

Chemical Compounds

EINFACHE VERSUCHE AUF DEM GEBIETE DER ORGANISCHEN CHEMIE (8TH EDITION). By *A. F. Holleman* and *L. Schuler*. Walter de Gruyter, Berlin, 1960. Pp. xx + 172. DM9.80.

This elementary practical handbook comprises a series of experiments designed to illustrate the properties of a wide range of common alaphatic and aromatic compounds and includes experiments on such natural products as glycerin and its tri-oleate, lactic and malic acids, glucose, glycine and pinene. The treatment is simple, the experiments are all such as can be performed with a few basic pieces of apparatus, and are suited to classes limited to short working periods in the laboratory. There is a great emphasis on colour tests, precipitation reactions and other test-tube experiments. The preparative descriptions are substantially qualitative in approach, and not much concerned with the isolation of the product in a state of purity; typical yields and physical constants of pure samples are consequently rarely quoted.

Overseas News

MONTECATINI SUE JAPANESE FIRM FOR INFRINGEMENT OF POLYPROPYLENE PATENTS

A LAWSUIT has recently been filed in Japan by Montecatini against Shin Nippon Chisso. According to company spokesmen, Montecatini took this step after Shin Nippon Chisso showed that they are resolved to go ahead in their attempt to manufacture polypropylene disregarding Montecatini's basic Japanese patent rights. The Japanese company has sought Government approval for their agreement with AviSun of the U.S., for the production of the polymer.

In Japan, Montecatini and Herman Ziegler have obtained basic patents and are about to be granted patents covering additional inventions and improvements. The Japanese companies Mitsui Chemical and Mitsubishi Petrochemical have Montecatini licences and the relevant agreements, which have been preliminarily approved recently by the Japanese Government, are expected to get final approval soon.

Several other important Japanese companies have asked for licences from Montecatini. According to Montecatini, Shin Nippon Chisso have not sought to obtain Montecatini's licence, but have started from the beginning in a course which Montecatini and several leading Japanese experts believe "must lead to the infringement of Montecatini's patents. Under these circumstances, Montecatini have felt obliged to take action in the defence of their own interest and of those of their Japanese licensees".

Poland to Limit Pharmaceutical Imports

The Polish authorities announce considerable increases in import duty on certain pharmaceuticals as from 15 November.

40% Increase in West German Chemical Imports

Over the first half of the current year, West Germany imported 40% more chemicals (by worth) than in the corresponding period of 1959, while exports rose over the same period by only 19%, according to a report from Frankfurt-on-Main. Respective totals for the first 1960 half-year were DM1,310 million and DM3,030 million.

For chemical imports, Europe remained the main source with almost 60% of total sales to West Germany, though deliveries from the United States increased by nearly 50%. Imports from fellow Common Market countries fell to 27% of the whole, the share of those from E.F.T.A. members rising slightly to 23.4%. E.F.T.A. and the Common Market are both reported to have bought more German chemicals over the period, E.F.T.A. now taking 28.3% (26.8%) of all Germany's chemical exports and the Common Market bloc 25.8% (24.1%).

Du Pont Plastics Laboratory for Geneva

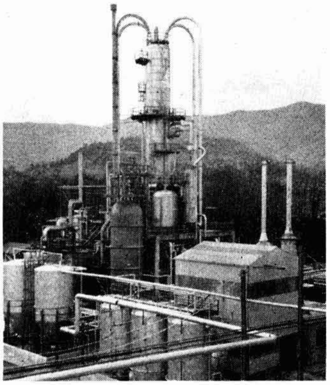
A plastics design laboratory will be built in Geneva by Du Pont de Nemours International, S.A., to help European manufacturers develop new applications, primarily for Delrin acetal resin and Teflon TFE and FEP fluorocarbon resins.

Sohio's One-step Acrylonitrile Process

Standard Oil (Ohio) have revealed some of the details of their one-step route to acrylonitrile. The method uses polypropylene, air and ammonia in a fixed fluidised bed catalytic process. The catalyst is a supported molybdenum-based material developed by Sohio. It has a high concentration of active ingredients and consequently is not easily affected by trace contaminants. The raw materials are in the reactor for only a few seconds. The operating temperature is well below 500°C and pressures are below 3 atm.

Refinery grade propylene streams and fertiliser grade ammonia may be used.

Montecatini's New Phthalic Plant Uses U.S. Process



New phthalic anhydride plant recently opened at ACNA-Montecatini Works at Cengio, North Italy. With a capacity of more than 10,000 tonnes/year, it is based on a U.S. process that gives excellent yields, low consumption of naphthalene and exceptional product purity (see C.A., 15 October, p. 632)

Propylene concentration of 40% is acceptable and the process will tolerate substantial amounts of low-molecular weight hydrocarbons. Commercial quantities of hydrogen cyanide and acetonitrile are produced as by-products.

Sohio expect greater expansion of acrylonitrile production now that their new plant is on stream since negotiations to sell the process are going well particularly overseas. The company estimates that in 1960 acrylonitrile consumption may reach 278 million lb.

French Company to Explore European Markets for Sahara Gas

A company with a capital of NF500,000 has been set up in Paris to examine possible European markets for Saharan natural gas. The company bears the full title of Société d'Étudea des Marchés Européens du Gaz d'Hassi R'Mel Transporté par Canalisations (SEMAREL). The aim of the company—to find markets for natural gas piped across the Mediterranean from North Africa to European consumer countries—indicates that problems connected with the technical side of such a project are now considered solved.

Celanese Raise Capacity with 95% Oxygen

To increase capacity at their Bishop, Tex, plant, Celanese Chemical, who make aldehydes, alcohols, oxides, ketones and acetals by noncatalytic oxidation of aliphatic hydrocarbons, have decided to switch from air to 95% oxygen. The advantages of this step are: by replacing the nitrogen in the air by hydrocarbon and oxygen, no additional reactors would be needed; a large reduction in the nitrogen present increases the upper limit of the hydrocarbon to oxygen ratio attainable in the feed, thus increasing the yield of useful products and reducing the formation of carbon monoxide, carbon dioxide and methane; with 95% oxygen, either propane or butane can be used in any unit.

As a major part of the plant's expansion, Celanese have built a unit to make 350 tons of 95% oxygen per day. Oxygen is mixed with hydrocarbon by a sparger in the hydrocarbon line. The sparger hole area is made so as to maintain a pressure differential between oxygen in the sparger and hydrocarbon in the main line.

French BP's £11 M. Investments to Include Petrochemicals

French B.P. have announced an investment programme amounting to N.Fr.150 million (£11 million) in 1961. Capacity of the Dunkirk refinery will be increased and a hydrogenation unit for lubricants added. At Lavéra refinery, near Marseilles, a bitumen factory is to be built.

Biggest effort of B.P. will be in the new refineries at Strasbourg and Algiers. Napthachimie B.P. and Pechiney's petrochemical subsidiary, are planning to expand the installations at Lavéra, and may also build petrochemical plants near the B.P. refinery at Dunkirk.

PEOPLE in the news

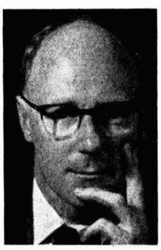
● **Mr. J. A. Dean, M.Sc., A.R.I.C.,** has been appointed deputy manager of the Research and Development Department of A. Boake, Roberts and Co. Ltd, London E.15. He will have executive responsibility for all sections of the department, including research and chemical engineering. **Dr. B. Dudley, Ph.D., B.Sc., F.R.I.C., A.R.C.S.,** who has been acting chief research chemist, has now been appointed chief research chemist

● **Mr. S. G. Harmer,** who for 11 years has been works manager of Whiffen and Sons Ltd., of Loughborough, has been appointed a director of the company.

● **Dr. Paul Baumann,** of Chemische Werke Hüls GmbH, Marl, West Germany, and **Dr. Hermann Holzrichter,** Farbenfabriken Bayer AG, Leverkusen, were this month presented with the Carl-Dietrich Harries Medal of the German Rubber Society.

● **Mr. M. Heeley,** formerly of Wm. Brook (Dyers) Ltd., has joined the technical service department of the Alliance Dye and Chemical Co. Ltd., Bolton, agents in this country for Compagnie Française des Matieres Colorantes (Francolor), Paris.

● **Mr. H. C. Rattle** has been elected a director of Aikman (London) Ltd., to replace Mr. B. J. Davis, who died recently.



L. M. Spalton, chairman of the Winthrop Group (see p. 716)

● **Mr. C. J. Smith** takes over as manager of the filter division of Eimco (Great Britain) Ltd. from **Mr. C. E. Silverblatt,** who will remain until early next year in a consultative capacity before returning to the U.S. **Mr. N. A. Satchwell,** previously chief draughtsman, has been appointed project manager to co-ordinate the activities of the filter division under Mr. Smith. **Mr. E. W. Laird** takes over from Mr. Satchwell as chief draughtsman.

● **Mr. Clifford E. Passmore** has been appointed field sales manager for the Midland Region of Griffin and George (Sales) Ltd., Ealing Road, Alperton, Middlesex, a member of the Griffin and George Group. Mr. Passmore joined Griffin and George (Sales) 10 years ago as a technical sales representative and will now be centred at the Midland regional headquarters at Frederick Street, Birmingham.

● **Mr. C. D. W. Stafford, M.P.S.,** chairman and managing director of Beecham Research Laboratories Ltd., relinquishes the latter appointment on 1 November. He will be succeeded as managing director by the assistant managing director, **Mr. G. J. Wilkins, B.Sc. Mr. R. Halstead, M.A., B.Sc., A.R.I.C.,** at present director and vice-president (production) of Beecham Products, Inc, the U.S. Group subsidiary, is to be appointed assistant managing director of Beecham Research Laboratories Ltd.

● At the second council meeting of the International Federation of Societies of Cosmetic Chemists held in Munich, **Dr. R. F. Marriott, B.Sc., F.R.I.C.,** who recently retired as managing director of County Laboratories Ltd., was elected president. He will be succeeded at County Laboratories by **Mr. C. Pugh, B.Sc., F.R.I.C.,** product research manager.

● **Mr. Rupert A. Withers** has decided, while continuing in his full-time executive capacity as deputy chairman of Ilford Ltd., to relinquish his appointment as joint managing director as from 20 October. **Mr. James Mitchell,** sales director, has been appointed to succeed Mr. Withers as joint managing director with **Mr. W. H. Dimsdale.**

● **Mr. Henry S. Land,** until recently chief chemist of Hardman and Holden Ltd., Manox House, Miles Platting, Manchester 10, has retired after 45 years with the company. His services have been retained as a consultant to the board.

● **Mr. J. E. B. Greeves** has been appointed to the board of Bramigk and Co. Ltd., 15 Gracechurch Street, London E.C.3, in the immediate capacity of assistant managing director. Educated at Campbell College, Belfast, he took an engineering degree at Cambridge. After the war he was with Alan Muntz and Co. Ltd., research and development engineers, until 1949 when he joined Fry-Cadbury Ltd., Montreal, as engineering and production director. Subsequently Mr. Greeves became chairman and managing director of Fry-Cadbury Ltd., which post he held until recently when he decided, for private and family reasons, to return to England to live.

● The Dutch Organisation for Pure Scientific Research has made two grants to **Professor Dr. J. F. Arens** for research in the field of acetylene ethers and organic sulphides. Both research schemes are aimed at developments in the synthesis field.

● **Dr. D. A. Dahlstrom,** vice-president and director of research and development, Eimco Corporation, Salt Lake City, U.S., arrived in the U.K. on 19 October for a two weeks' visit. Dr. Dahlstrom will be visiting some of the installations of Eimco filters and thickeners manufactured by Eimco (Great Britain) Ltd. at their recently extended Gateshead factory.

Obituary

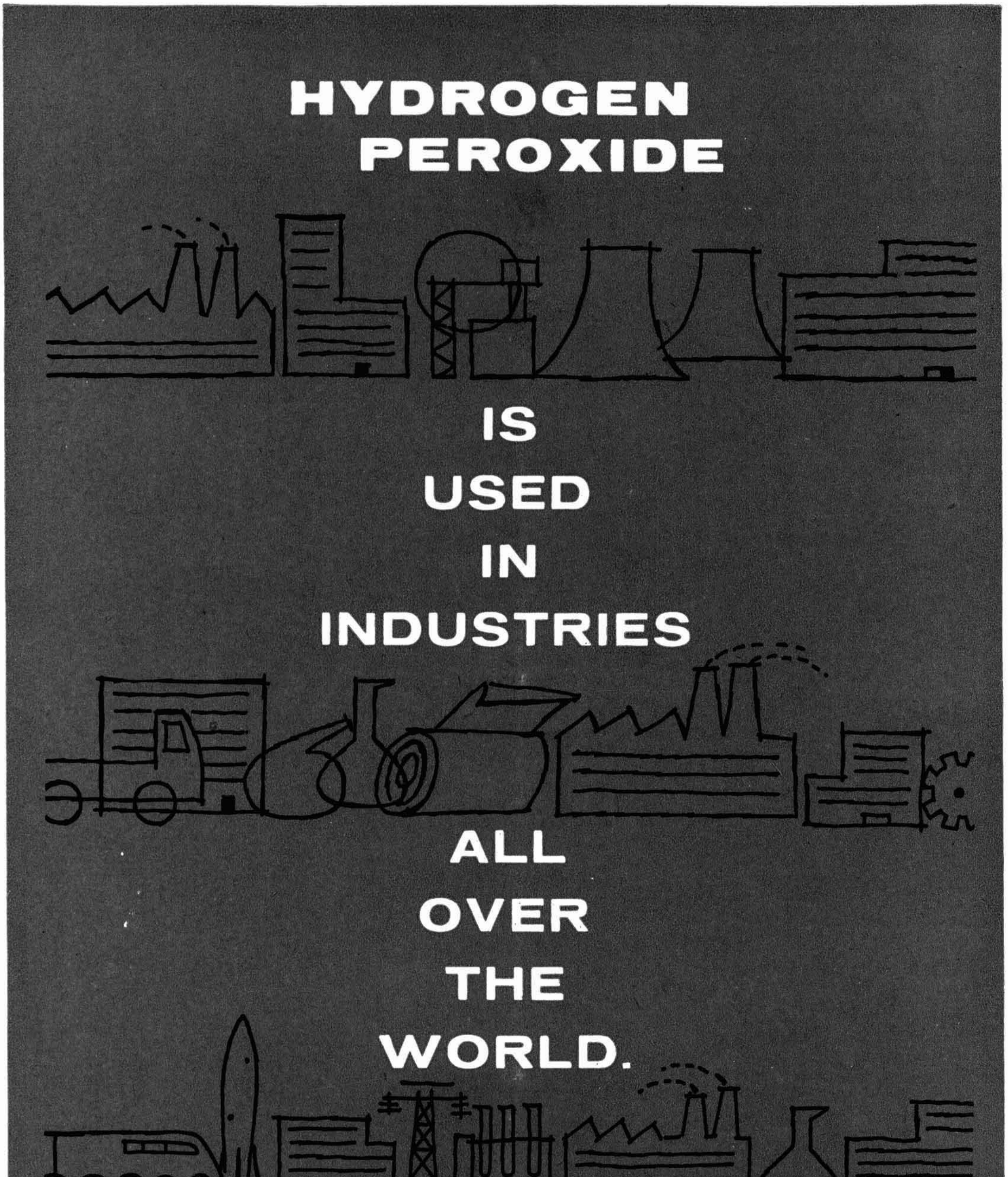
Mr. Alec B. Steven, a lecturer in dyestuffs at the Royal College of Science and Technology, Glasgow, for almost 40 years, has died aged 83. He joined the college in 1908 as its first lecturer in dyestuffs, remaining in the post until his retirement in 1945. During the last war he worked on the chemistry of explosives for the explosives directorate of the Ministry of Supply.

Cyanamid U.K. Team Works on Process Development at Gosport

In the U.K., Cyanamid of Great Britain Ltd. have a team under **Dr. Eric London** engaged in process development and in improving production techniques at the company's Gosport plant for the British and certain export markets served from there. This development group will expand in the future to adapt and test the company's products, especially in agriculture.

In the U.S., **Dr. Richard J. Turner** has been appointed manager of product development for Cyanamid International as part of a continuing programme to equip the international division with its own sales, manufacturing and product development operations.

Having organised their operations into a group of semi-autonomous subsidiaries Cyanamid now intend to devote their efforts to meeting the specific needs of their customers. The company's scientific knowledge in the pharmaceutical, agricultural and general chemical fields and manufacturing know-how will be adapted to the environment and habits of other peoples. Cyanamid recognise that they can not engage in international business only as an adjunct to their domestic operations.


HYDROGEN PEROXIDE
IS USED IN INDUSTRIES
ALL OVER THE WORLD.
LAPORTE of course!
. . . are the largest manufacturers of Hydrogen Peroxide in the British Commonwealth.

TRADE NOTES

Lantor Non-wovens

Fothergill and Harvey Ltd., and Lantor Ltd.. an associate of Tootal Ltd., and West Point Manufacturing Co., U.S., have concluded an arrangement whereby Fothergill and Harvey Ltd. will sell Lantor non-woven products. Among these uses, in the field of reinforced plastics, are low pressure laminates as surfacing tissues for polyester/resin/glass laminates for various uses in chemical plant. Non-wovens can also be used for air and liquid filters; bonded with synthetic rubber filters give a lower back pressure than woven fabric filters.

Waxes in Surface Coatings

The latest 'Wax technical service bulletin No. 70' of Bush, Beach and Segner Bayley Ltd., Marlow House, Lloyd's Avenue, London E.C.3, contains details of waxes in their range, other than A Wax BASF, which give a good dispersion and scuff-resistant finishes. These include Abril 10DS, a high melting wax, which can be used for stoving enamels.

Technique of Odour Control

The first edition of a booklet, 'The technique of odour control' has been published by May and Baker Ltd. The subject of odour control is treated with particular reference to the M&B Alamask range of compounds but there are sections on the nature of the problem, the causes of industrial malodours and general methods of control.

Acheson Dispersions

The list of standard Acheson dispersions has been revised and reprinted for the first time in booklet form. The classification includes 38 dispersions in seven main groups: graphite, water base; graphite, oil base; graphite, solvent base; molybdenum disulphide dispersions; special dispersions; resin-bonded dry film lubricants; and resin-bonded p.t.f.e. dry film lubricants. The technical data given include carrier liquid, approximate solids content, density, diluent and flash point. Copies can be obtained from Acheson Colloids Ltd., P.O. Box 12, Prince Rock, Plymouth.

Viscometers Demonstration

A demonstration of the Ferranti-Shirley cone-and-plate viscometer and Ferranti portable viscometer is to be staged by Ferranti Ltd., at the Birmingham Exchange and Engineering Centre, from 22 November to 25 November, inclusive. Companies in the area who wish to have their own samples tested should write for an appointment to Mr. H. Harrison, instrument sales manager. Ferranti Ltd., Moston, Manchester 10.

Automation Equipment Expansion

An expansion which will nearly double the size of the factory over the next three years is being started at the Lanarkshire factory of Honeywell Controls Ltd. As well as increasing the output of automation equipment, the expansion will enable the company to increase its contribution to the export drive.

Already 40% of the company's output is exported; orders currently being dealt with include £250,000 worth of automation for Russian sugar and chemical plants, and a £300,000 control system for an Indian oil refinery.

Laporte Bleaching Exhibition

A bleaching exhibition will be held by Laporte Chemicals Ltd. at the St. Enoch Hotel, Glasgow, from 21 to 23 November. It will mainly demonstrate the use of hydrogen peroxide, associated percompounds, and sodium chlorite in the textile industry. Wool materials that have been treated by the shrink resist process developed by Wool Industries Research Association, and which employs peracetic acid and sodium hypochlorite, will be shown. A lecture will be given on 22 November at 7 p.m. in St. Enoch Hotel, by Mr. L. Chesner, on 'The role of hydrogen peroxide, peracetic acid and sodium chlorite in bleaching'.

DIARY DATES

MONDAY 31 OCTOBER

C.S.—Cardiff: Chemistry Dept., Univ. Coll., Cathays Park, 5.30 p.m. 'Chemotherapy', by Dr. F. L. Rose.

C.S.—Durham: Science Labs., Univ., 5 p.m. 'Interhalogen compounds & polyhalides', by Dr. A. G. Sharpe.

C.S.—Leicester: Univ., 4.30 p.m. 'Fascination of fluorine', by Prof. R. N. Haszeldine.

TUESDAY 1 NOVEMBER

C.S.—Dundee: Chemistry Dept., Queen's Coll., 5 p.m. 'Teaching of chemistry', by Dr. N. G. Brown.

C.S.—Leicester: Chemistry Dept., Univ., 8 p.m. 'Metal uranates: a new family of complex oxides', by Dr. J. S. Anderson.

I.Chem.E.—Chester: Blossoms Hotel, 7.30 p.m. 'Prediction of ternary data from binary systems', by E. Evans.

WEDNESDAY 2 NOVEMBER

S.A.C.—London: Wellcome Bldg., Euston Rd., N.W.1., 2 p.m. Meeting on 'Analysis of semi-conductors'.

THURSDAY 3 NOVEMBER

C.S.—London: Burlington Hse., Piccadilly, W.1, 7.30 p.m. Meeting for reading of original papers.

C.S. with R.I.C. & S.C.I.—Bristol: Chemistry Dept., Univ. ,6.30 p.m. 'Reaction mechanisms', by Prof. E. D. Hughes.

Plastics Inst.—Southampton: Chemistry Dept., Univ., 7.30 p.m. 'A review of dough moulding compounds', by N. Evans.

R.I.C.—London: Brunel Coll. of Tech., Woodlands Rd., W.3, 6.30 p.m. 'Non-aqueous solvent systems', by Dr. C. C. Addison.

Textile Inst.—Manchester: 10 Blackfriars St., 7 p.m. 'Cross-linking of cellulose-chemistry', by Dr. J. Honeyman.

FRIDAY 4 NOVEMBER

C.S.—Cambridge: Chemical Lab., Lensfield Rd., 8.30 p.m. 'Light absorption by molecules in crystals', by Prof. D. P. Craig.

C.S.—Southampton: Chemistry Dept., Univ., 5 p.m. 'Chemistry & pharmacology of some adrenaline antagonists', by Prof. N. B. Chapman.

R.I.—London: Albemarle St., W.1, 9 p.m. 'Very fast chemical reactions', by Prof. G. Porter.

S.A.C.—Leeds: Gt. Northern Hotel, 7.15 p.m. 'Analytical chemistry of phosphorus', by N. T. Wilkinson.

S.C.I.—Glasgow: Royal Coll. of Science & Tech., 6 p.m. Fifth Charles Tennant Memorial Lecture: 'Melting & freezing', by Prof. A. R. Ubbelohde.

S.C.I.—London: 14 Belgrave Sq., S.W.1, 6 p.m. 'Production & uses of carbon disulphide', by Dr. W. J. Bushell.

S.C.I.—Manchester: Robinson Lecture Theatre, Univ., 6.30 p.m. 'Application of mass spectrometry to organic chemistry', by J. H. Baynor.

Commercial News

• £1 m. Increase in Fisons Group Profit
• S.T.D. Declare 5% Final Dividend
• Hoechst Shares for London Exchange Soon
• Hallesche Salzwerke Plan New Plastics Move

Fisons Ltd.

Goup profit of Fisons before tax for the year ending 30 June shows an increase of nearly £1 million at £4,500,000. Net profit is up from £1,800,000 to just over £2 million. A final dividend of 7% on the ordinary is recommended, making a total of 11% on the stock as increased by the scrip issue last December.

Scottish Tar Distillers

For the year ended 30 June, net profit of Scottish Tar Distillers Ltd. was £100,391 (£77,752), after tax of £101,499 (£59,444). Final dividend of 5%, making 7½% (6¼) is declared. £50,000 (£40,000) is allocated to general reserve and £78,436 (£71,470) is carried forward.

Compagnie Francaise de Raffinage

The French oil refining concern Compagnie Française de Raffinage, whose petrochemical holdings include 35% of the share capital of Petrosynthèse (general petrochemicals), 33% of Manufacture Normande de Polyéthylène-Manolène (polythene) and 22.3% of Société du Caoutchouc Butyl Socabu (synthetic rubber), have raised their own share capital from NF.130 million to NF.142 m. The company, who recently announced plans for a joint petrochemical venture with the American El Paso concern, have now introduced their shares to the Paris Stock Exchange.

Farbwerke Hoechst AG

Some 15% of the capital of Farbwerke Hoechst AG is now held by interests outside Germany. In face value, over DM20 million worth of Hoechst shares are in Switzerland, about DM10 million worth in the U.S. and a further DM3 million in France. Hoechst shares are planned to be introduced to the London Stock Exchange next spring, initially for some DM1 million. Entry on to the Brussels Bourse is expected for the late autumn of this year, while application has been made to enter the Paris Bourse and the Swiss Stock Exchanges.

Eurunion

The investment fund for the common market area, Eurunion, has announced that chemical shares now occupy the leading place in the list of industries covered by the fund. These now account for 15.11% of the fund's total, while the share of the oil industry has fallen to 5.81%. Half-year dividend was 20 Luxemburg francs (2s 11d), same.

New Surpass Petrochemicals

New Surpass Petrochemicals, Limited, had a net profit of $18,108 in the six months ended 30 June. No comparisons are available, but for the full year 1959 the company had a net loss of $107,866. Earnings for the second half of this year are expected to be higher as improvements in processing and plant efficiency increase the yield of saleable material from the same amount of raw materials.

Harzer Dolomitwerke GmbH

Harzer Dolomitwerke GmbH, mineral processors and chemical producers, formed to continue the Schwarzfeld plant of the liquidated I.G. Farben group and with a capital of DM1,600,000, have moved their base from Leverkusen to Wülfrath, West Germany.

Hallesche Salzwerke

At the annual general meeting of Hallesche Salzwerke und Chemische Fabrik Kalbe AG, Dusseldorf, payment of a 1959 dividend of 4% (same) on DM975,000 share capital was approved. At the same time it was announced that the company was planning to strengthen its holdings in the plastics industry and in an unnamed chemical-pharmaceutical concern.

Stainless Steel Company

Plans have been announced jointly by Allegheny Ludlum Steel Corp., Pittsburg, and the Belgian firms, Evence Coppee et Cie., Brussels, and Societe Anonyme Metallurgique d'Esperence-Longdoz, Liége, for the formation of a major new stainless and special steel company in Western Europe. Allegheny Ludlum will have equal ownership with the Belgians. The company plans to build a new stainless steel plant in Belgium involving capital investment of over $10 million. Production is to begin in 1962.

NEW COMPANIES

BRETTON MANUFACTURING AND CHEMICAL CO. LTD. Reg. cap. £5,000. Dealers, traders, merchants and distributors of fine and heavy chemicals, etc. Secretary: S. H. Lucas. Reg. office: 6 Surrey Street, London W.C.2.

P. SAMUELSON AND CO. LTD. Cap.: £5,000. To acquire the business of 'P. Samuelson and Co.' and to deal in essential oils, chemical preservatives, citrus products, perfumery materials, etc. Reg. office: 1 Crutched Friars, London E.C.3.

POLYTHENE POWDERS (MICRO-MESH) LTD. Cap. £100. Reprocessors and refiners of all types of polythene materials and plastic scrap cellulose acetate, p.v.c., rubber, etc. Director: M. Gordon. Reg. office: 27 Queen Anne Street, London W.1.

KINDER AND JAMES LTD. Cap. £1,000. Chemical engineers, petroleum engineers, nuclear engineers, etc. Directors: C. V. Barratt (director of Refinery Equipment and Speciality Co. Ltd., etc.), G. W. Kinder (director of G. W Kinder and Co. Ltd., etc.), P. J. A. Janes (director of G. W. Kinder and Co. Ltd.), H. J. V. Charlton (director of H. E. Charlton Engineers Ltd.), and T. S. Saul. Reg. office: 30 St. Ann Street, Manchester 2.

Market Reports

ACTIVE DEMAND FROM TEXTILE TRADE

LONDON The market for industrial chemicals continues steady, and new inquiry for home consumption and on export account has been about the level of recent months, while contract delivery specifications have covered good quantities. Demand from the textile trades has been active. Prices have moved within narrow limits and with few exceptions are unchanged and firm. The fertiliser market is moderately active with an increased volume of inquiry in one or two sections. The call for most of the coal tar products remains strong and the undertone of prices is firm.

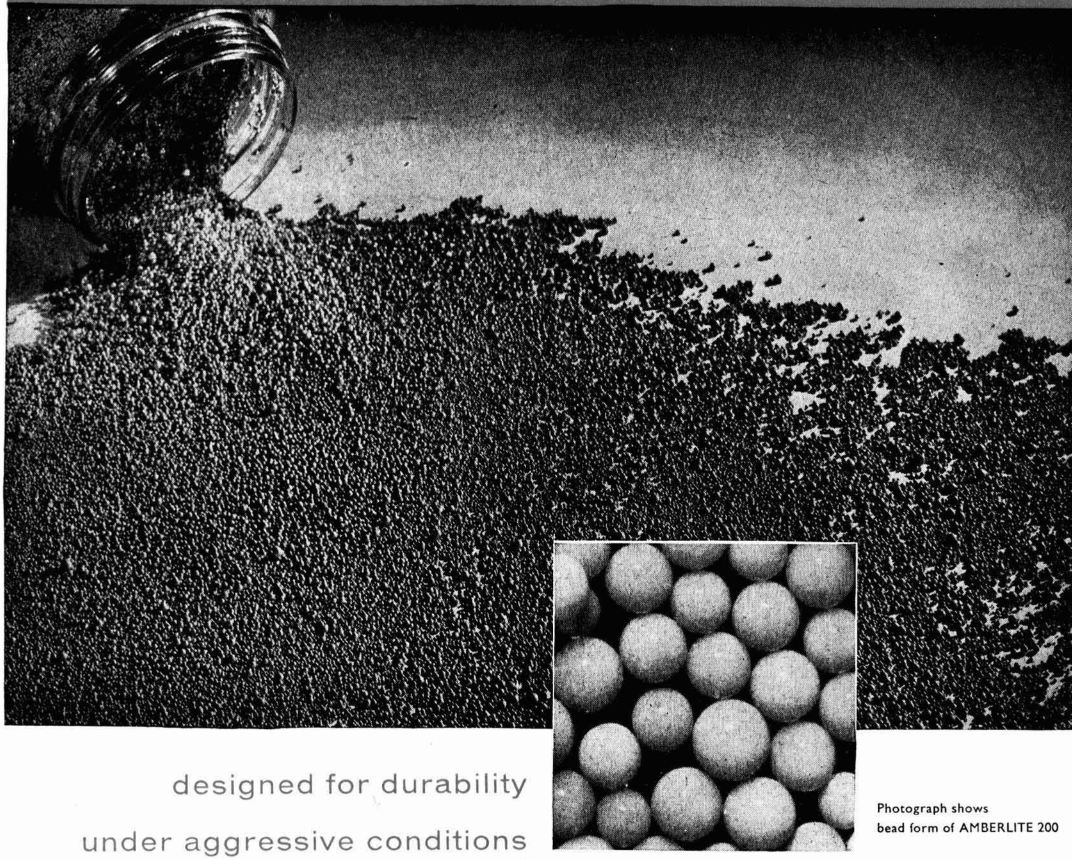
MANCHESTER There has been little change in the general position of the Manchester chemical market compared with recent weeks. Industrial consumers in the home section are, with an odd exception, calling for good supplies of the alkalis and other lines against contracts, and a fairly steady movement on overseas accounts has been reported during the past week. Additional business of both prompt and forward delivery has been on a fair scale. So far as quotations are concerned the undertone has been steady and few changes of any consequence have occurred since the last report. The coal-tar products are mostly finding a ready outlet, and in the fertiliser section a brisk demand for basic slag and a steady movement of those lines that are subject to early delivery rebates are reported.

SCOTLAND There has not been a great deal of change in general conditions. Demands have continued at a steady level with a satisfactory movement of chemicals to some sections of the textile and allied industries. Demands for the basic chemicals have also been maintained, particularly those against contracts. There has been some change in prices, but the trend is mainly firm.

The export position is still fairly brisk, with a reasonable volume of varied inquiries.

AMBERLITE 200

a NEW ion exchange resin



Photograph shows bead form of AMBERLITE 200

designed for durability

under aggressive conditions

AMBERLITE 200 represents an entirely new concept in polymer chemistry. A high capacity, strongly acidic cation exchange resin, AMBERLITE 200 has physical and chemical stability unmatched by any available cation exchange resin. Outstanding features of AMBERLITE 200 include . . . high resistance to oxidation, especially in water containing chlorine, oxygen and metals such as iron, copper and manganese; perfect bead form; high attrition resistance; stability over the entire pH range; insolubility in all common solvents.

In water treatment in either hydrogen or sodium cycle operation, the exceptional bead characteristics of AMBERLITE 200 make possible more rapid and complete bed classification, low losses from mechanical attrition, and greater freedom from bead fracture caused by thermal and osmotic shock. For example, 2,000 regeneration-exhaustion cycles using saturated brine and calcium chloride showed no measurable resin breakdown, whereas, conventional cation exchange resins showed failure of from 20 to 75%.

Write for full information on AMBERLITE 200 and for our booklet "IF YOU USE WATER" to:—

Chemicals for Industry

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AP45

NEW PATENTS

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

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

ACCEPTANCES

Open to public inspection 30 November

Method of producing nitrogen dioxide in a nuclear reactor. Rensselaer Polytechnic Institute. **855 191**

Cyclopentanophenanthrene derivatives and process for the production thereof. Syntex S.A. **855 300**

Manufacture of derivatives of nitrofurfuraldehyde. Norwich Pharmacal Co. **855 193**

Fungicidal composition and basically substituted thiazoles for use therein. Monsanto Chemical Co. **855 389**

Process for polymerisation and the products produced thereby. American Cyanamid Co. **855 235**

Method of supplying a catalyst to a reaction zone and apparatus therefor. Phillips Petroleum Co. **855 120**

Process for the removal of carbon monoxide from olefin-containing gas mixtures. Farbwerke Hoechst AG Vorm. Meister, Lucius & Brüning. **855 133**

Preparation of antibiotics designated demethyltetracyclines. American Cyanamid Co. **855 169**

Monoepoxide of cyclopentadienes, their derivatives and processes for the preparation. Columbia-Southern Chemical Corp. **855 199**

Method for preparation of polystyrene. National Lead Co. **855 202**

Method of preparing esters of N-substituted ethylene imine carboxylic acids. Smrt, J. **855 444**

Process for the preparation of uranium fluoride. Junta de Energia Nuclear. **855 446**

Curing of polyepoxides. Devoe & Raynolds Co. Inc. **855 205**

Process for the manufacture of copper phthalocyanine that is solvent-resistant in the α-form. Ciba Ltd. **855 098**

Biguanide derivatives. Aspro-Nicholas Ltd. **855 017**

Production of silica hydro-organosols and aerogels. Monsanto Chemical Co. [Addition to 782 474 and 814 768.] **855 502**

Preparation of 2-methyl-4-chloro-phenoxy alkanoic acids. British Schering Ltd. **855 504**

Cycloheximide alkyl hydrazones and pesticides containing same. Upjohn Co. **855 106**

Carbamates of bicyclic alcohols. Boehme, W. R., and Nichols, J. **855 210**

Method of conducting gaseous chemical reactions using an electric discharge. Imperial Chemical Industries Ltd. **855 084**

Aromatic polyamino-acids and salts thereof. Imperial Chemical Industries Ltd. **855 431**

Processing isoolefin-diolefin rubbery copolymers with kaolin clays. Esso Research & Engineering Co. **855 137**

Insecticides. Fahlberg-List Chemische und Pharmazeutische Fabriken Veb. **855 505**

Bis-triazinylamino-stilbene compounds. Farbenfabriken Bayer AG. **855 480**

Manganese pentacarbonyl hydride and a process for its preparation. Badische Anilin- und Soda-Fabrik AG. **855 065**

4-Aminoquinaldinium salts. Allen & Hanburys Ltd. **855 212**

Polyester resin ink. Goodyear Tire & Rubber Co. **855 066**

Process and apparatus for pelletting carbon black. Phillips Petroleum Co. **855 086**

Reduction of nitriles to primary amines. Unilever Ltd. **855 027**

Process for the production of vinyl chloride polymers. Imperial Chemical Industries Ltd. **855 213**

Carbostyril derivatives. Geigy AG., J. R. **855 022**

Production of 4-(pyridine-carboxylic acid amido) - 2, 3-dimethyl-1-phenyl-5-pyrazolones. Stoltenberg, P. **855 165**

Organo-tin compounds containing sulphur and their application. Pure Chemicals Ltd. **855 214**

Production and isolation of boron trichloride. United States Borax & Chemical Corp. **855 024**

Quaternary salts of resinous C-vinylpyridine polymers and photographic films rendered antistatic therewith. Kodak Ltd. **855 028**

Process for separating thorium, cerium and rare earths from mixtures of their oxides or hydroxides. Gottdenker, F., and Krumholz, P. **855 481**

Method of terminating the polymerisation of mono-olifinically unsaturated monomers. Chemstrand Corp. **855 151**

Selective hydrogenation of acetylene to ethylene. Imperial Chemical Industries Ltd. **855 288**

Polymerisable epoxide compositions. Union Corp. **855 025**

Spin-dyeing of acrylonitrile polymers. Farbenfabriken Bayer AG. **855 153**

Covulcanisation of low unsaturated polymers with high unsaturation polymers. Esso Research & Engineering Co. **855 032**

Process of and apparatus for producing uranium fluoride. Commissariate a l'Energie Atomique. **855 217**

Process for the production of macromolecular polyacrileins. Deutsche Gold- und Silber-Scheideanstalt Vorm. Roessler. **855 483**

Synthetic detergent cakes. Drew & Co. Inc., E. F. **855 159**

Resinous compositions. Union Carbide Corp. **855 484**

Production of unsaturated hydrocarbons by cracking hydrocarbons. Badische Anilin-& Soda-Fabrik AG. **855 485**

Method of curing rubbery fluoroelastomers. United States Rubber Co. **855 240**

Heterocyclic hydrazine derivatives and a process for the manufacture thereof. Hoffmann-La Roche & Co. AG, F. **855 486**

Aromatic dipivalates. Bataafse Petroleum Maatschappij N.V. **855 242**

Chlormethyl derivatives of alkyl-benzenes. Monsanto Canada Ltd. **855 487**

Isolation of dimethyl phenol. Yorkshire Tar Distillers Ltd. **855 489**

Water-soluble thermoplastic cellulose ether compositions. Dow Chemical Co. **855 491**

Production of cyanogen. Union Carbide Corp. **855 493**

β-Aminoalkylthianaphthene and β-aminoalkylbenzofuran derivatives. Smith Kline & French Laboratories. **855 115**

Hydrogenation of oxyheterocyclic compounds. Quaker Oats Co. **855 225**

Electrothermic production of carbon disulphide by fluidised bed techniques. Shawinigan Chemicals Ltd. [Divided out of 854 268.] **855 245**

Electrothermic reduction of the sulphur content of coke particles by fluidised bed techniques. Shawinigan Chemicals Ltd. [Divided out of 854 268.] **855 246**

Electrothermic production of carbon monoxide by fluidised bed techniques. Shawinigan Chemicals Ltd. [Divided out of 854 268.] **855 247**

Preparation of sulphonylureas. Pfizer & Co. Inc., C. **855 034**

Water repellent synthetic resin compositions and a method of applying such compositions. General Motors Corp. **855 035**

Insecticidal organic phosphates. Bataafse Petroleum Maatschappij N.V. **855 238**

Dialkyl esters of 2,5-diphenyladipic acid. National Distillers & Chemical Corp. **855 476**

Open to public inspection 7 December

Manufacture of combustible gas. Humphreys & Glasgow Ltd. **855 860**

Determination and control of compositions in chemical processes by titration. Imperial Chemical Industries Ltd. **855 708**

Recovery of nickel from solution. Permutit Co. Ltd. **855 709**

Control of ion-exchange processes. Permutit Co. Ltd. **855 681**

Basic esters of xanthylidene acetic acid. Ward Blenkinsop & Co. Ltd. **855 862**

Red vat dyestuffs for the dipyrazolanthronyl series. General Anilin & Film Corp. **855 710**

Pyrolysed linear polyolefins and process for production thereof. Phillips Petroleum Co. **855 540**

Graft copolymers and preparation thereof. Rohm & Haas Co. **855 711**

Manufacture of silicon. Pechiney Compagnie de Produits Chimiques et Electro-Metallurgiques. **855 913**

Preparation of halogenoaliphatic compounds. Haszeldine, R. N. [Addition to 848 561.] **855 785**

Halogenated and/or sulphohalogenated copolymers of lower olefins and process for their manufacture. Farbwerke Hoechst AG Vorm. Meister, Lucius & Brüning. **855 714**

Method for separating carbon dioxide and hydrogen sulphite from gas mixtures. Benson, H. E., and Field, J. H. **855 543**

Cyclopentanophenanthrene derivatives and process for the production thereof. Syntex, S.A. **855 800, 855 801**

Manufacture of carbon black. United Kingdom Chemicals Ltd. **855 802**

Preparation of starch phosphate esters. Corn Products Co. **855 731**

Low temperature liquefaction and fractionation of gaseous mixtures. Air Products Inc. **855 668**

Process for the manufacture and recovery of chlorenic acid. Hooker Chemical Corp. **855 586**

Production of alpha hydroxyisobutyric acid. Escambia Chemical Corp. **855 880**

Process for the manufacture of polymers by emulsion or suspended polymerisation. Farbwerke, Hoechst AG Vorm. Meister, Lucius, & Brüning. **855 669**

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Continued from page 742

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