

# Chemical Age

incorporating  
PETROCHEMICALS and POLYMERS

NEW CHAIRMAN  
FOR HOWARDS (P. 768)  
D.C.L. VENTURE  
IN INDIA (P. 769)  
O.E.C.D. CHEMICALS  
REPORT (P. 771)

12 May 1962. Vol. 87. No. 2235

THE WEEKLY NEWSPAPER OF THE CHEMICAL INDUSTRY



TURN WASTE  
INTO MONEY

WITH

**ALLIS-CHALMERS  
COMPACTORS**

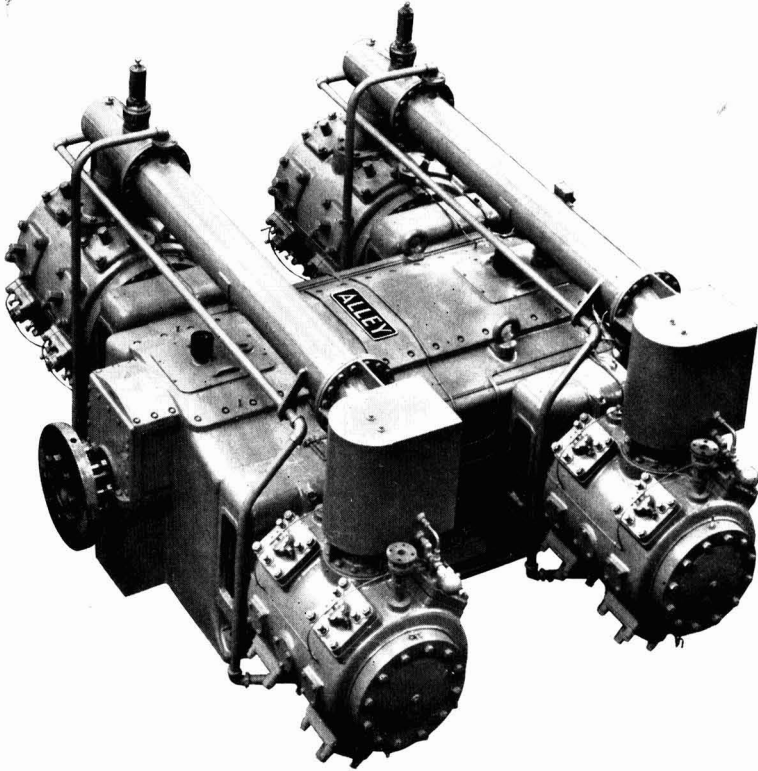
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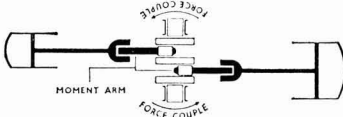
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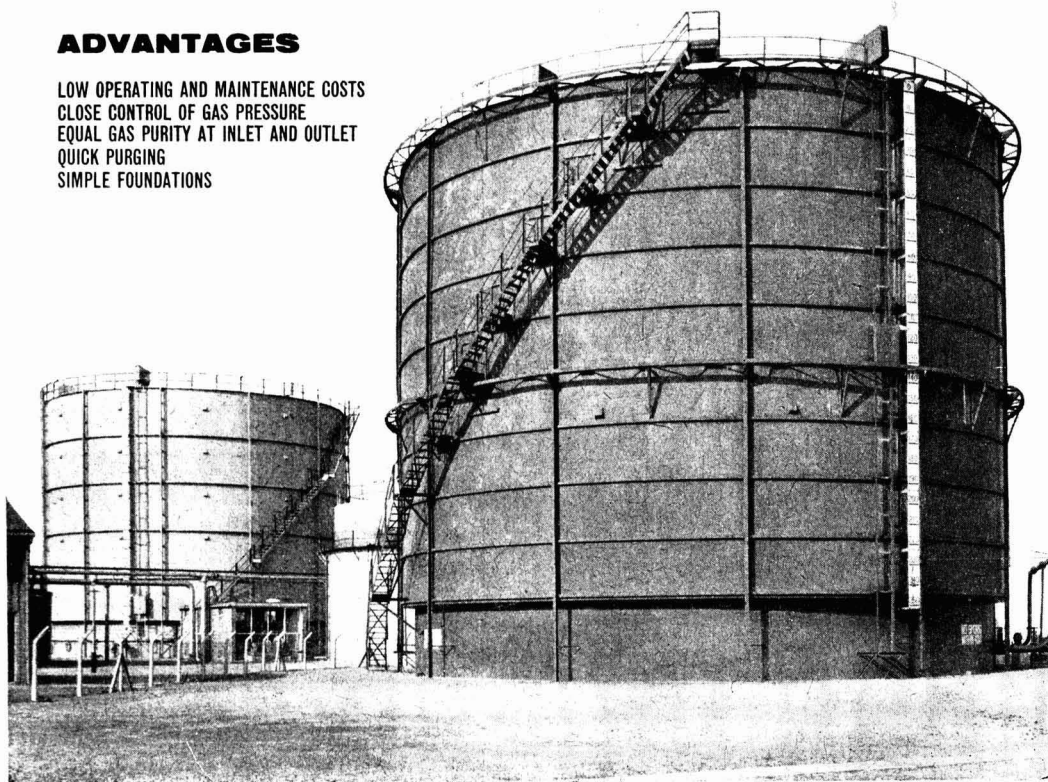
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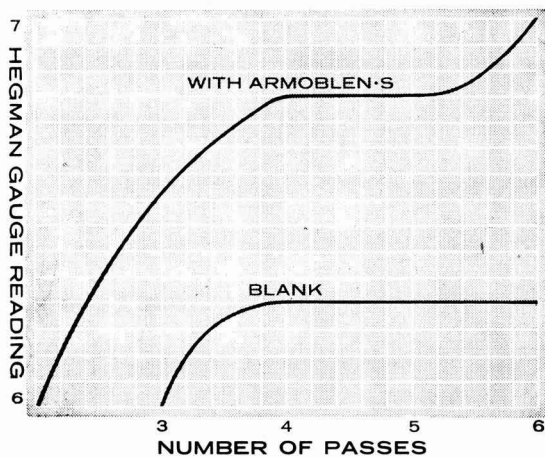
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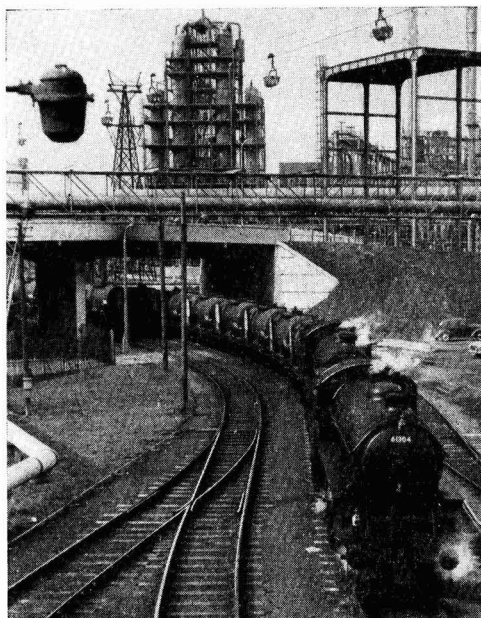
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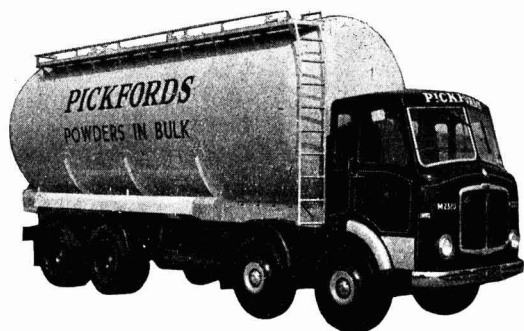


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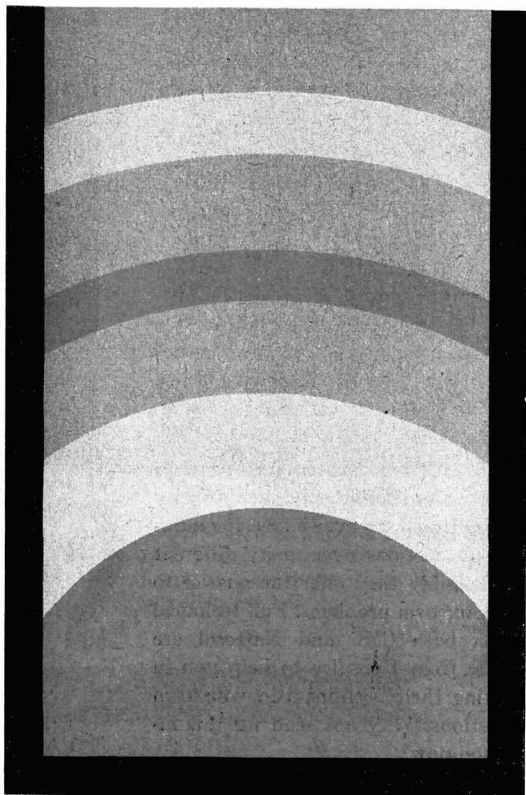
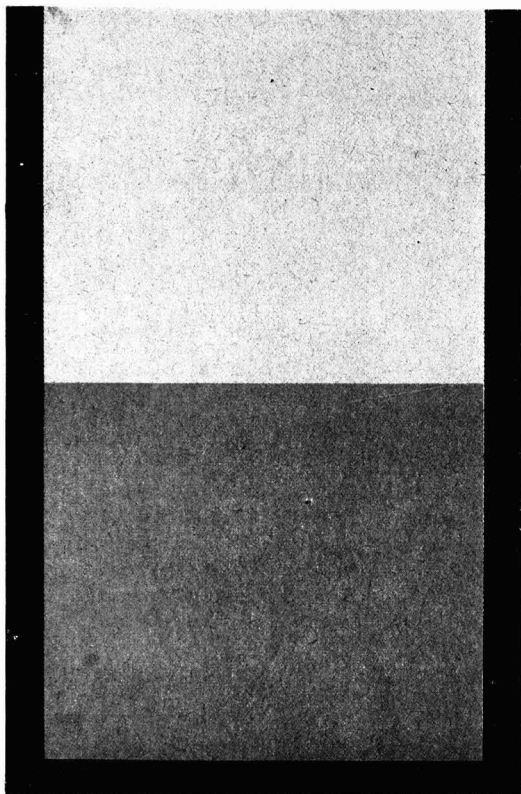
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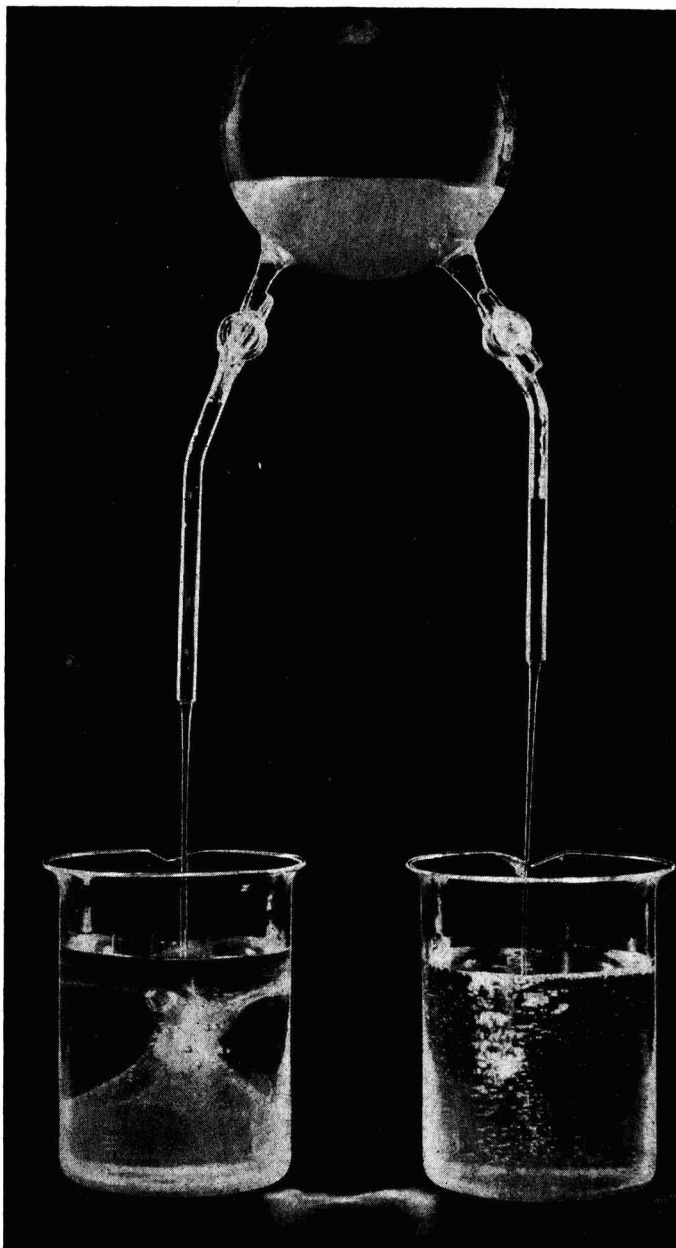
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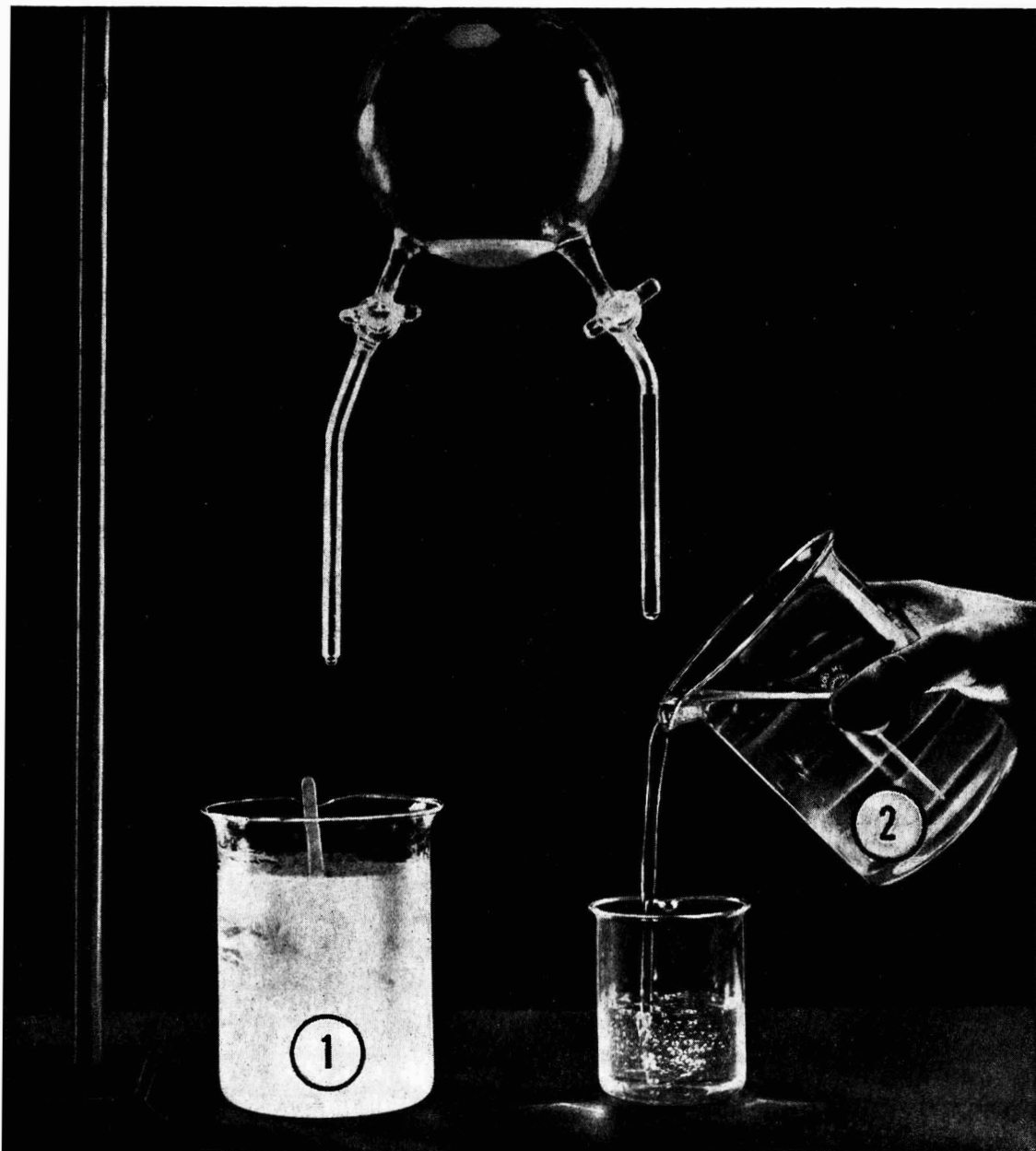
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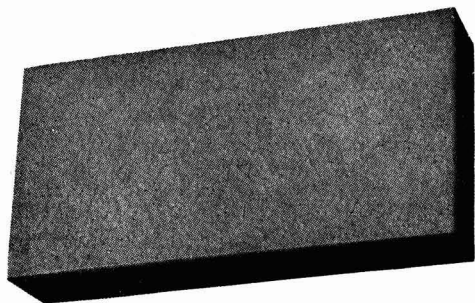
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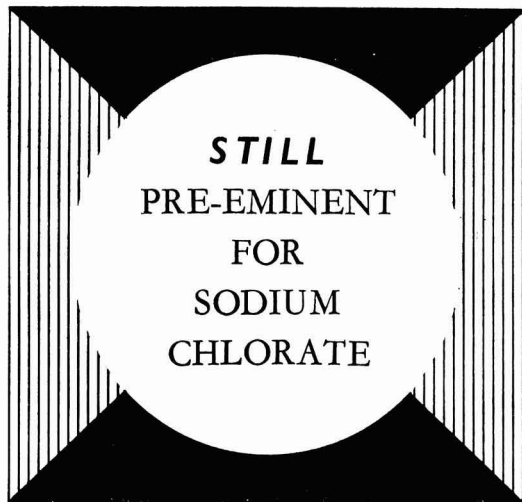
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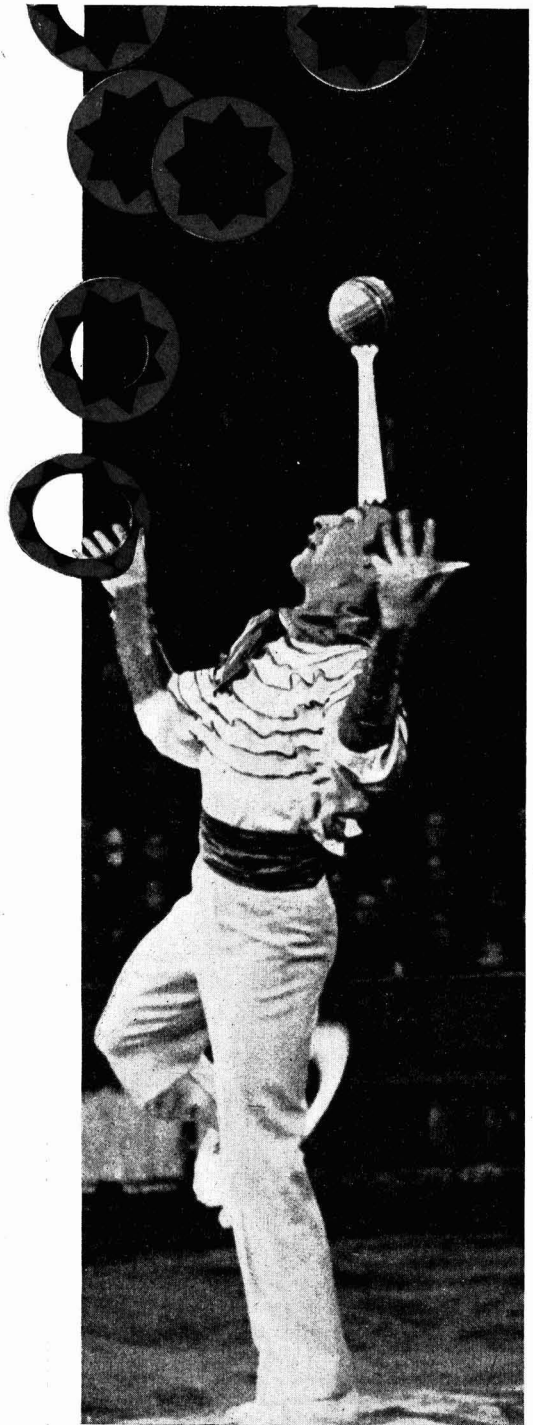
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1) Pollard, F. H., Hanson, P., and Geary, W. J., *Anal. Chim. Acta*, 1959, **20**, 26-31

2) Wehber, P., *Z. anal. Chem.*, 1959, **166**, 186-9

3) Busev, A. I. and Kanaev, N. A., *C.A.*, 1959, **53**, 18747c

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## RESEARCH SPENDING

THE main question about research is not whether industry can afford it, but whether it can afford to do without it. This point was made by John Maddox writing on whether industrial research pays in the first issue of the new house magazine *Simon Engineering News*.

Certainly the British chemical industry owes its present position to an intensive programme of research and development. There are signs that any programme for faster growth must include provision for even higher expenditure on research. According to the latest *Economic Review* of the National Institute of Economic and Social Research, this may be particularly important in Britain because it is one of those countries whose growth is linked to the growth of exports. Technical advance at a high rate is likely to be necessary to sustain that competitive power.

While British industry cannot hope to rival U.S. industry in absolute volume of industrial research, the report believes it might be possible to compensate for smaller total resources by greater concentration of effort through research organisations. So far as the chemical industry is concerned, this need for more intensive research and development has been one of the main reasons behind the mergers of the past few years.

The N.I.E.S.R. report was published simultaneously with an article on British research that appears in the current issue of the *Midland Bank Review*. While the Midland Bank finds that research in U.K. industry is on a scale comparable with that carried on in other leading manufacturing countries, the N.I.E.S.R. draws some disturbing conclusions from a comparison between industrial research in this country and in the U.S.

The N.I.E.S.R. survey is a comprehensive analysis of research spending in the U.K. and U.S. during 1959. A research exchange rate of \$6.3 to the £ is used because of differences in research costs. After making this adjustment, U.S. industry's research spending is five times larger than that of British industry; expressed as a percentage of net output, the U.S. is spending nearly twice as much as the U.K. For the U.K. chemical industry, spending represents 4.5% of net output in 1958; 6.9% in the U.S.

In terms of real expenditure per employee, research was about three times as big in the U.S. as in Britain in 1959. In terms of qualified manpower, for every 1,000 workers in the U.S. chemical industry in 1959 there were 27 qualified scientists and engineers and 17 for each 1,000 in the U.K. Although Britain's chemical industry is shown to lag behind its counterpart in the U.S., it is significant that America's relative superiority is below average in chemicals.

The main conclusion—that British industry's research activity is very much less than that of America—is not upset by an analysis of possible qualifications. These include the amount of external spending on research done on contract or in research associations; the use of licensing and the acquisition of the results of research done in other countries; or the amount of research done in other sectors of the economy.

Faced with difficult trading conditions, the chairmen of almost all British chemical companies that have reported in recent months have shown clearly that they are relying on more intensive research and development work—particularly in the field of process improvement—to help them find ways of cutting costs.

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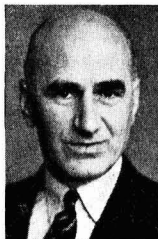
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## New chairman takes over at Howards and Sons, Ilford

ON taking up his new appointment as group labour officer for the Laporte Group of companies, **Mr. T. W. Howard** has resigned from his appoint-



T. W. Howard



F. S. Spring

ment as chairman of Howards and Sons Ltd., a wholly-owned subsidiary of Laporte Industries Ltd. Mr. Howard, who is a Fellow of the Royal Institute of Chemistry, remains a director of Howards and Sons Ltd., and of their U.K. subsidiary, Howards of Ilford Ltd.

**Dr. F. S. Spring, F.R.S.**, research director of Laporte Industries, has, in addition, been appointed chairman of Howards and Sons. Before joining the Laporte group, Dr. Spring was Freeland Professor of Chemistry at the Royal College of Science and Technology, Glasgow.

**Mr. P. E. Watson**, who joined the group in 1948, has been appointed managing director of both Howards and Sons Ltd., and Howards of Ilford Ltd. Mr. Watson, who is a physicist, is a graduate of Birkbeck College, London, and Oxford University, where he gained an M.A. He joined National Titanium Pigments, as Laporte Titanium were then known, as a physicist in 1948. In 1955 he became deputy research manager of Laporte Titanium, research manager in 1957 and in 1958 took on additional duties as titanium oxide works manager at Luton. In 1959, Mr. Watson was



P. E. Watson

transferred to Laporte Chemicals as personal assistant to the general manager.

**Mr. J. A. E. Howard** continues as chairman of Howards of Ilford Ltd. He is also chairman of Bowmans Chemicals Ltd., Widnes, Lancs.

## I.C.I. announce higher first quarter sales, launch cost-cutting campaign

FUTURE emphasis of I.C.I.'s operations will be on cost reduction, their chairman, **Mr. S. P. Chambers**, told shareholders at the company's annual meeting on 3 May. Highly competitive conditions were likely to continue, he said, with production capacities for many chemical products remaining in excess of demand for a time. It must therefore be the company's aim to secure reasonable profits with a growing volume of business at lower prices.

"To do this it will be essential to intensify our efforts to achieve the lowest possible costs of established products and more desirable than ever that we should be in the van with a succession of new and profitable products."

Whereas in the past the emphasis had been on the increase of production capacity to meet demand with a minimum of delay, it was now more necessary to ensure that production was based on the cheapest and most modern processes.

Apart from research and development ("two of the key activities in this direction") costs were being reduced by taking steps at the design stage to prune

capital costs to a minimum and to ensure that once the plants were erected production costs were as low as they could be made consistent with effective operation.

Another way they were attacking costs was by modifying the company organisation. The formation of Imperial Metal Industries Ltd. to control the company's metal interests other than in aluminium was an example. In addition, it was proposed to transfer control of Wilton Works to the Heavy Organic Chemicals Division. Other changes were also under consideration.

As a last example, Mr. Chambers said they were examining critically every form of expenditure throughout the company and the reasons for it. The whole operation would take "some considerable time" but was expected to yield "some substantial reductions in costs."

On the prospects for trading in 1962, Mr. Chambers said the evidence to date continued to support the opinion expressed in his letter to stockholders on 19 February that results should be

(Continued on page 774)

## A. and W. Group Australian merger

MANUFACTURING and marketing of flavours and perfumery chemicals in Australia have been merged by the Albright and Wilson Group companies **W. J. Bush and Co. (Australia) Pty. Ltd.**, and **A. Boake Roberts (Australia) Pty. Ltd.**

It is understood that this move, which follows a study of the best ways in which Bush and ABRAC could work together overseas, will not affect operations in the U.K. No similar merger is contemplated in this country, where the activities of the two companies are on a much larger scale than in Australia.

Bush have now taken over the manufacture and sale of ABRAC products in Australia and will handle sale and distribution of ABRAC products exported to Australia from the U.K. ABRAC's manufacture of plasticisers in Australia has been taken over by Albright and Wilson (Australia) Pty. Ltd., owned 57.5% by A. and W. and 42.5% by I.C.I. of Australia and New Zealand.

Substantial economies are expected to follow this merger. **Mr. J. A. D. Paul** is managing director of Bush (Australia); **Mr. D. J. Craven**, managing director of ABRAC (Australia) is returning to the U.K. this summer to take up a senior sales position in ABRAC, London.

## Oil duty

### Turning the clock back

'At a time when industry is being inundated with exhortations to increase exports, it is difficult to understand the actions of a Government which increases the whole range of industrial costs by a material increase of tax on fuel oil.'—**M. J. C. Hutton-Wilson**, chairman of Associated Chemical Companies, in his annual statement.

'There are some costs over which we have little or no control. The imposition of the heavy duty on fuel oil last year is a case in point. This burden has, I fear, not only increased our fuel bill with an adverse effect upon costs, particularly on export products, but has turned the clock back on some important technical developments.'—**Paul Chambers**, I.C.I. chairman, addressing shareholders at the annual general meeting.

## Haworth symposium on carbohydrate chemistry

Commemorating the work of the late **Sir Norman Haworth**, an international symposium on 'Carbohydrate Chemistry' will be held, under the presidency of **Professor M. Stacey**, at the new Haworth chemistry Building, Birmingham University, from 16 to 20 July. It is being jointly sponsored by the Chemical Society and the University.

## Project News

# Distillers to take part in big three-way Indian project

AN advanced stage is reported to have been reached in the formation of a new three-way venture in India in which the **Distillers Company Ltd.** will be one of the partners. The others will be Hercules Powder, Wilmington, Del., and Nowrosjee Wadia and Sons (Private) Ltd., a leading Indian industrial concern in the textile chemicals field.

Products of the new venture will be cumene, phenol, acetone, diacetone alcohol, phthalic anhydride and phthalate plasticisers. Government approval has already been granted for the formation of a new company which will be called **Herdillia Chemicals Ltd.**; and licences have been granted for the range of chemicals planned.

Although Distillers have yeast interests in India—Mr. S. C. Stewart, managing director, D.C.L. Yeast Division, recently attended the opening of the new plant of the associated Indian Yeast Co. Ltd.—this is D.C.L.'s first chemical venture. Capacities of the new plants are understood to be: acetone, 6,000 tons/year; cumene, 14,500 tons; phenol, 10,000 tons; diacetone alcohol, 2,000 tons; phthalic anhydride, 6,000 tons; and phthalates, 3,000 tons.

Most of the equity of the new company will be held by Indian nationals; D.C.L. will have the biggest foreign holding and will provide technical assistance as well as giving the new company the benefit of their manufacturing and research experience in organic chemicals.

The phenol process will be that developed by D.C.L. in the U.K. and independently developed by Hercules in the U.S. This process is widely used throughout the world, there being large-scale plants in the U.K., elsewhere in Europe, North America and Japan. Part of the acetone produced will be used captively for diacetone alcohol; processes for diacetone alcohol and phthalate plasticisers will be those developed by D.C.L. research.

## Tenders invited for Irish fertiliser factory

● THE new State-sponsored Irish company **Nitrigin Eireann** has now invited tenders for the erection of the nitrogenous fertiliser factory which it is to operate at Arklow, Co. Wicklow (see *CHEMICAL AGE*, 12 August 1961, p. 221). The project is expected to cost about £7 million.

## I.C.I. gas plant reaches design output in 3 days

● THE second pressure steam reforming unit at the Heysham works of **I.C.I. Billingham Division** for the production of synthesis gas for ammonia and methanol has been successfully started

up, reaching planned output without three days of the oil feedstock being injected. This smooth and rapid start-up is attributed to the experience gained during the start-up on the first unit, which came into full operation a few weeks ago.

Engineering design work on the Heysham project started early in 1959, followed by the start of construction in the spring of 1960. Computers were used by the engineering teams to cut time on intricate problems. Among the problems were choice of materials for tubes and hot pipes and method of fabrication. Linings for hot vessels, handling of steam at 300 p.s.i. and 640° C, design of combustion equipment and modification for use at a higher pressure of compressors previously used at atmospheric pressure all presented engineering problems. Project manager was Dr. R. J. Young.

The Heysham plant has now been fully converted from coke-based to oil-based production. I.C.I. feel that the smooth start-up augurs well for the start of production of the first of four similar units now being built at Billingham. Construction work on this £6 million project is going ahead rapidly and is up to schedule.

## Bechtel to complete N.Z. refinery in 1964

● CONTRACT for their New Zealand refinery has been awarded by **Shell International Petroleum to Bechtel International Ltd.**, and it is scheduled to go on steam by March 1964. It is expected construction will begin this August and Bechtel will form a N.Z. company for the project.

As reported in *CHEMICAL AGE*, 21 April, p. 638, it is widely believed that Bechtel International have been appointed main contractors for the new South Wales refinery of Regent Refining.

## 120 ft. stacks for Kent aromatics plant

● ERECTION of two 120 ft. stacks on to 60 ft. bases has just been completed at the BP Kent oil refinery, Isle of Grain, by the erection department of **George Wimpey and Co. Ltd.** The stacks, which form part of the Birwelco heaters for use on the **BP California Ltd.** aromatics plant now under construction, each weighed 20 tons and were lifted into position by a single 160 ft. Butters gin pole secured by earth anchors.

The stacks were brought to the site in five sections, and welded alongside their respective heater bases. The gin pole was supported by six 1½ in. wire guy ropes, four attached to 10-ton hand winches used for controlling the luffing move-

ment, and two attached to Tirfor hand operated cable winches used primarily for stabilising.

A feature of the lift was the use made of Molex earth anchors in place of concrete deadmen. These anchors, manufactured by W. E. Waite Ltd., Aldershot, comprise a helix-shaped blade attached to a steel shaft, screwed into the ground by a tommy bar inserted through the load bearing eye. Each of the winches on the six guys were secured by four 12 in. anchors, while the base of the pole, which rested on a 1 in. steel plate, was tied down by wire ropes reeved through six anchors.

A significant factor in the operation was the saving in materials, time and labour since, apart from its ease of installation, an advantage of the Molex anchor is that it may be withdrawn and used again. This was an important consideration at the Isle of Grain where several lifts were required.

## Whessoe to erect U.K.'s first refrigerated butane plant

● A CONTRACT worth £175,000 has been awarded to **Whessoe Ltd.**, Darlington, for the supply and erection of what is probably the first refrigerated butane storage and vaporisation plant in the U.K. It is part of the Lurgi gasification plant being built at the Coleshill works of the West Midlands Gas Board by **Woodall-Duckham Construction Company Ltd.**

The contract is for one double skinned butane storage tank with an internal capacity of 2,500 tons of refrigerated butane and an internal design pressure 1.5 p.s.i.g. at a design temperature of -10°F, also three storage vessels or bullets and all the associated refrigeration plant.

## B.D.H. executives involved in reorganisation

FURTHER stage in the reorganisation of British Drug Houses has been announced with the appointment of Mr. F. W. Griffin to take charge of the company's wholesale division. The division will be responsible for the sale of the company's standard drugs and for their wholesale subsidiaries, J. R. Gibbs and Rowland James.

Mr. H. Treves Brown, secretary of B.D.H., has been appointed to take charge of the overseas operations division. He is succeeded as secretary by Mr. D. E. Middleton.

The executive responsibilities of Mr. C. M. Hill, Dr. C. Ockrent and Mr. A. Rendall have been terminated. B.D.H. say that these moves are not in any way connected with their association with Mead Johnson.

## Obituary

**Dr. Stanley Paul**, staff officer of the Unilever Research Laboratory, Port Sunlight, since 1957, died suddenly recently, aged 47. An associate of the R.I.C., he qualified as a B.Sc. and Ph.D. at Liverpool University. He joined Unilever in 1939.



★ THE new link by Distillers in the formation of a three-way Indian venture (see p. 769) is a landmark for the company. Distillers already have considerable investments in Australia through C.S.R. (Chemicals) Ltd., and the former Commonwealth firm of National Chemical Products Ltd., South Africa.

With the Indian Government's plans for a large-scale development of chemicals and plastics facilities, the new move is a shrewd one, giving these industries a native supply of several important raw materials. In view of the range of chemicals to be produced, I estimate that the initial capital will be somewhere around £5 million. This is, however, only my guess for Distillers have yet to announce the project.

★ It is difficult to see at present precisely what the appointment of Mr. Avison Wormald to the newly created post of chairman of Grace Brothers Ltd. is going to mean in terms of the Grace group's continued expansion in Europe. Grace, of course, already have substantial interests in shipping, chemicals (in their widest sense) and fertilisers, not only in the U.S. but also in South America, the Caribbean and elsewhere, including Britain. They also have interests on the Continent, including a stake in the packaging industry.

It will be Mr. Wormald's chief task to build up these interests still further by seeking new investments for the company both here and in Europe, particularly in the Common Market countries. However, in precisely what fields his activities are most likely to be felt no one with any inside knowledge is yet prepared to say. When I asked a spokesman for Grace Brothers this week whether Mr. Wormald's name being linked with the company in this connection meant the future accent would be on fertilisers and chemicals, all he would say was that in appointing him Grace had been concerned chiefly with Mr. Wormald's qualities as a business administrator (and these are considerable) rather than with the fact that he had hitherto been connected with the chemical industry throughout his business life, "though no doubt his advice will be sought from time to time when the company is considering its chemical activities". No doubt.

★ SINCE it was first stated about a year ago that Bayer were to build a giant chemical plant in the Belgian port of Antwerp, there has been a good deal of speculation as to the nature of

this unit, Bayer not having divulged what is to be produced there. Interest has recently been revived by the increase from B.F.1 million to B.F.12.5 million of the Bayer Belgian subsidiary Bayer S.A., as reported in CHEMICAL AGE, 14 April.

A clue to the character of the plant has now been given by a recent speech of the Belgian M.B. Delwaide, who is also Antwerp Councillor responsible for port problems. Speaking of the important oil refining industry of the city, he said: "Connected with this is the construction of three petrochemical plants, while the general chemical industry is being expanded by a Bayer Leverkusen establishment, the company having purchased a 150-hectare site in the port area."

This indicates that the Bayer unit will either not be a petrochemical plant or will use other raw materials as well as oil. The latter possibility seems the most likely, since Antwerp is primarily an oil refining centre.

★ ACCORDING to Dr. G. Natta and co-workers at the Instituto di Chimica Industriale del Politecnico, Milan, it is possible to make crystalline syndiotactic polypropylene exclusive of other isomeric forms. The catalyst used contains a vanadium compound and an aluminium dialkyl monohalide.

Factors which influence the stereospecificity of the polymerisation are the aluminium to vanadium ratio, the vanadium compound used, reaction temperature and the nature of the alkyl groups attached to the aluminium. The catalytic systems used to date are specific for making isotactic polypropylene.

★ REASON for I.C.I.'s decision to erect new pharmaceutical manufacturing and packaging facilities at Macclesfield (CHEMICAL AGE, 4 February 1961, p. 207 and 5 May 1962, p. 724) and so concentrate all their pharmaceutical activities in Cheshire is the need to obtain full advantage of the discovery of new products by beginning production with a minimum of delay.

Mr. S. P. Chambers told the shareholders' meeting on Thursday of last week that this need applied particularly to pharmaceutical products and hence the move, which will result in the transfer of the Pharmaceutical Division's present processing and packaging activities from their Scottish sites.

It is intended that the new facilities will be able to undertake at short notice the manufacture and packaging of new products arising from the results of work

at the division's research laboratories at Alderley Edge and, as Mr. Chambers sees it, the links between research and development will then not only be shorter but also stronger than is possible with the existing facilities.

★ PROOF that the Federal German chemical industry is not taking the current slow-down of turnover lying down was given by a speech made at the opening of the Hanover Fair on Sunday by Professor Carl Wurster, president of the West German Chemical Manufacturers' Association, and chairman of B.A.S.F. In Federal Germany, where there are more than 23,000 chemical patents at present registered with 11,000 more pending, chemical industry research investment has now reached a total annual sum of more than DM650 million (that for 1960).

The keenness to build up a cadre of chemical experts for the future is shown by the fact that apart from the millions of marks granted annually by individual companies to universities and technical colleges, the industry as a whole subscribes a levy of DM1/month for each employee to a special fund for the promotion of science.

Dr. Wurster spoke of some of the difficulties facing West German chemical producers, which have a familiar ring. He mentioned the sharp competition in chemicals that has forced prices down despite growing production costs, of the growth of chemical industry in under-developed countries and the consequent fall-off in demand for goods from traditional chemical export countries; and recent lethargy on the capital market and Stock Exchange. A particular example of the increasing costs in the West German chemical industry is the fact that whereas productivity rose by only 5% over last year, gross hourly wages went up by as much as 14%.

★ It looks as though I have tried to be a little too clever. By linking together what I thought were related facts, some confusion has been caused.

The new process (block polymerisation of caprolactam) developed by B.A.S.F., which permits the production of plastics components weighing up to several tons, referred to on this page (28 April) is not described in the booklet available from Allied Colloids as implied. However, anyone interested in the new process should contact B.A.S.F. (United Kingdom) Ltd., 334/341 Abbey House, Victoria Street, London S.W.1.

The booklet mentioned is in no way connected with the process, but merely gives data on properties and applications for the whole of B.A.S.F.'s Ultramid range. This booklet is available from Allied Colloids Ltd., who are B.A.S.F.'s distributors for Ultramid in the U.K.

*Alembic*

# O.E.C.D. REPORTS 13% RISE IN EUROPE'S 1960 CHEMICAL SALES

**T**OTAL turnover of the European chemical industry in 1960 amounted to \$19,750 million compared with a revised figure of \$17,500 million in 1959—an increase of 13%. This is the highest since 1954 (15%) and compares with a previous highest of 11.5% in 1959, states the latest report of the Chemical Products Committee of O.E.C.D., just published.

Other points from the report, which describes the situation during 1960 and points to trends during the first half of 1961, are as follows:

1. Production in the chemical industry increased more rapidly in 1959 and 1960 than that of the manufacturing industries generally (14% compared with 10%) thanks to important increases in the French, German and Italian index figures (31%, 16% and 15% respectively). This rate of expansion slackened somewhat during the first half of 1961, however, despite the continuing high level of investment, which rose from \$1,325 million in 1959 to \$1,540 million in 1960 (i.e., by 16%). Nearly 20% of the total was invested in petroleum chemicals.
2. Apparent consumption of chemical products in Europe rose from \$15,650 million in 1959 to \$18,000 million in 1960 (15%).
3. More than 80% of total European output came from four countries—Germany and the United Kingdom each supplying about one-quarter and France and Italy each producing about 10%. Of the remainder Holland, Belgium and Spain each had an output of between 3 and 4% of the total, while the remaining 11 produced about 10%.
4. Total imports by European O.E.C.D. member countries amounted to \$3,140 million in 1960 (25% more than in 1959) while exports were valued at \$4,256 million (an increase of 14%). Exports in 1960, however, accounted for a smaller proportion of turnover than in the previous year except in the case of France and Italy when they amounted to 21% and 10% of turnover respectively as against 17% and 8%. Exports accounted for three-quarters of Switzerland's total turnover in chemicals, about one-third of that of the Belgo-Luxemburg Economic Union, nearly 25% in the case of both Germany and Sweden and one-fifth of that of the U.K.

Reporting in detail on international trade, the committee stresses that intra-European trade increased most markedly

among member countries of the E.E.C., where exports rose by 28%. Among the E.F.T.A. countries, exports rose by 15% and imports by 17%.

A statistical study has been started to follow competition in chemical exports to certain 'third markets' by the O.E.C.D., countries combined, the United States, Canada, Japan, the U.S.S.R. and Eastern Europe and in this year's report imports of six countries—Argentina, Brazil, Colombia, India, Mexico and Venezuela—have been analysed for the three-year period 1957-59.

With two exceptions—Brazil and Venezuela—no definite trend has been observed in the period. In Brazil, however, a yearly decrease of about 10% has been noted, while in Venezuela there was an increase in imports of over 50% between 1958 and 1959. On the other hand, the committee has observed a definite rise in the percentage of imports from the Soviet bloc into some countries—Argentina, Brazil and India, particularly. In Argentina, from 1957 to 1959 the Soviet bloc share of the country's chemical imports rose from 1% to 14%. In Brazil the increase was from 3% to 8% and in India it was from 1% to 7%.

Furthermore, says the report, in all six countries, exports from the O.E.C.D. and the United States combined show a downward trend over the three years. Although this period is too short to allow any far-reaching conclusions to be drawn, the evidence provided indicates that there is a need for close observation of developments in these 'third markets' in the future.

Referring to the trend in the industry in the first half of 1961, the report says that combined output of the member

countries showed an increase of 7% over the same period of 1960, while the production index for the half year rose from 209 to 224. Even though this increase was well above that of manufacturing industry generally in the countries concerned, where output went up by 5%, it was more modest than in the last few years and, although for 1961 as a whole the increase over 1960 may eventually prove higher than 7%, a few countries have expressed doubts as to the possibility of such a rapid expansion, the report adds.

On the other hand, investments realised by most countries during the first six months of 1961 showed no decrease from those for the first part of 1960 and though quantitative figures were not available when the report was drafted, countries' evaluations of future investment plans gave the impression that the volume of investments for the whole of 1961 would match or even surpass the 1960 figure.

Compared with the first half of 1960, the value of trade in chemicals, on the whole, increased, in the early half of last year though the brisk expansion registered by member countries in the first six months of 1960 showed no signs of repeating itself. Some countries showed modest increases of between 1% and 10% for imports as well as exports while others showed increases of up to 30% (Italy). Holland registered an increase of 14%, and Austria reported a rise in imports of 15%. Spain, too, while not submitting absolute figures for the period, indicated sizeable increases in exports as well as imports, the latter influenced by its liberalisation programme which began in mid-1960.

## Current investment plans will more than double 1960 petrochemicals output

**O**UTPUT of petrochemicals in O.E.C.D. countries increased by 45% in 1960 to a total of 1,680,000 tons (in terms of carbon content) as against a rise of 40%—already regarded as exceptionally rapid—in 1959. After giving these figures in its consideration of the petrochemicals sector, the committee goes on to say that investments now being planned could raise production capacity to an overall figure of 3,660,000 tons by 1963, which would make it possible for the 1960 output to be more than doubled.

It seems doubtful, however, whether

sales possibilities at that time will have developed fast enough to absorb all this new capacity, the report adds.

As for 1960, chemicals in the C<sub>2</sub> group (acetylene, ethylene, and their derivatives) still showed most rapid development though sales of aromatics and C<sub>3</sub> chemicals (propylene) have also expanded considerably.

During 1960, too, consumption of feedstock—oil, oil fractions, refinery gas and natural gas—in the production of petrochemicals increased by 46% over the 1959 figure to reach a total of 6.2 million tons. Natural gas still played an

unimportant role as feedstock in all countries, however, with the exception of Italy where it accounted for 36% of the total feedstock tonnage and production of petrochemicals based on natural gas amounted to 40% of the total. Oil (crude oils and fractions) accounted for 66% of total feedstock and refinery gas 34%, figures which give some indication of the extent to which European chemical plants are integrated with oil refineries and petrol cracking plants. The report goes on to forecast that feedstock consumption in 1963 may well be almost double that of 1960, i.e., 12.2 million tons. In spite of the increased quantities now being utilised in France and Italy, however, it is not thought that natural gas will form a great percentage of the total.

O.E.C.D. member countries other than Holland invested a total of \$336 million in petrochemicals in 1960 compared with \$270 million the year before. Expansion plans for the 1961-63 period, referred to above, call for a total of \$1,250 million or an average of \$415 million annually. Of this sum Italian projects will require \$420 million altogether and France, the U.K. and Germany aim to invest \$265 million, \$213 million and \$240 million respectively.

Production of dyestuffs in member countries in 1960 increased by 9% in tonnage and 12% in value. The rate of increase, however, was not as rapid as in 1959, when it had been 21%, though this figure followed a year in which the volume of production fell by 14% and the value by 12%.

Italy recorded the highest increase in output (24% in tonnage and 18% in value). Other major increases were registered by Switzerland (12% and 14%), Germany (12% and 13%), the U.K. (8.5% and 11%) and France (7% and 12%).

The greater increase in value of production as opposed to volume was a continuation of the trend which had become increasingly apparent in recent years and was accounted for by the tendency to turn more towards the production of high-quality dyestuffs. Compared with the rest of the world the increase in tonnage recorded by the O.E.C.D. member countries was the highest percentage increase of all.

Investment in dyestuffs in 1960 continued at the same pace as in recent years and was mainly concentrated on the modernisation of existing plants.

The third and final sector dealt with individually in the report concerns plastics materials. Sales of four countries, France, Germany, Italy and the U.K., together reached over 95% of those of the U.S. in 1960 with the French and Italian plastics industries—the third and fourth largest producers—each registering the most progress with total sales increases of 35%. Germany's sales increased by 24% in the same period and those of the United Kingdom by 12%. The total increase for the European plastics industry as a whole was 24% higher than in 1959, at 2,497,000 tons.

Germany continued to account for the greater individual share of the total (39%) while the U.K. share diminished

from 25% in 1959 to 23% in 1960. France and Italy benefited most from the decline in the U.K. proportion of the total, each recording small rises and accounting for 14% and 12% respectively of the whole.

Combined sales by O.E.C.D. countries of phenolic and aminoplastics, alkyds and most other thermosetting resins rose 19% (17% in 1959). Polymerisation and copolymerisation products—including polythene, p.v.c., polystyrene, acrylic and most other thermoplastics materials—showed much the same rate of increase as in 1959, rising by 31% to reach 1,306,000 tons and in fact this latter group represented a little over half of the area's total sales of plastics materials during the year. Sales of cellulose derivatives gained slightly more rapidly than in 1959 (12% altogether) but there was a drop of 3% in sales of hardened protein materials.

Many countries reported difficulties in obtaining supplies of maleic and phthalic anhydride during the year and in France some polyester plants were forced to stop production. By the end of the year, however, most of the difficulties caused by shortages had been overcome.

The report has little to say on investments in the plastics materials sector except that during the period in question they were almost entirely confined to thermoplastics. In Austria investment centred around the construction of a

polypropylene plant. In Holland, too, the greatest activity was displayed in the field of polyolefins. German investment during the year exceeded the \$170 million invested in 1959, though here the emphasis was on the rationalisation and modernisation of plant. In the same period Italy invested \$40 million on the production of plastics materials and Spain spent \$5 million on new plant and extensions to existing plant. Altogether \$42 million has been earmarked for investment in petroleum chemicals in Spain during the next four years and it is expected that a large part of this sum will be devoted to plastics.

Considerable activity in the European plastics industry in the years to come is forecast in the report. Most countries plan to extend their production of p.v.c., polystyrene, and polythene and increasing attention is being given to the development of polypropylene, while certain Scandinavian countries also plan to increase their capacity for some polycondensation products, particularly aminoplastics.

The committee's overall view of the future is one of optimism. In the words of the report: "Increased productivity and hence lower prices should make it possible to extend existing trade outlets with particular reference to countries where the plastics industry is as yet undeveloped."

## O.E.C.D. Chemical Products Committee reports on progress in member countries

THE committee reports in detail on the situation in the chemical industries of O.E.C.D. member countries in 1960 as follows (excluding the U.K. and Canada):

**Austria:** Turnover amounted to Sch6,700 million (\$260 million) against Sch5,600 million (\$215 million) in 1959—an increase of 20% (4% in 1958 and 16% in 1959). The index of production rose from 200 to 239.

Foreign trade increased, imports rising to \$117 million (\$99 million in 1959) and exports to \$44 million (\$39 million).

**Belgium:** The production index rose from 158 in 1959 to 178, and turnover increased from B.Fr.29,000 million (\$580 million) to B.Fr.30,000 million (\$600 million).

Investment in the industry during the year totalled B.Fr.2,700 million (\$54 million) as against B.Fr.2,100 million (\$42 million) in 1959. Another feature was a slight drop in prices, bringing the index of wholesale prices down from 107.5 to 106.9 (base 1953 = 100) and an increase in exports by the Belgian chemical industry as a whole despite a marked decline in exports of nitrogenous fertilisers during the last quarter.

**Denmark:** The production index rose from 133 in 1959 to 136. Allowing for a production increase of 2.3% and a rise in prices of about 1%, the value of production has been estimated at D.Kr.735 million (\$105 million) com-

pared with D.Kr.700 million (\$100 million) in 1959.

Investments in the chemical sector in 1960 (including oil refineries, rubber factories and plants producing oil and rubber additives) totalled D.Kr.176.7 million against D.Kr.101.5 million (\$26 million against \$15 million).

Total Danish chemical imports in the period under review amounted to \$164 million while exports—confined to a few groups such as pharmaceuticals, plastics and organic chemicals—expanded from \$51 million to \$62 million (23%).

**France:** Total 1960 turnover was NF16,900 million (\$3,445 million) compared with NF14,300 million (\$2,915 million) in 1959. The global index for chemicals was 286 against 174 for French industry as a whole (excluding building), but while the indices for dyestuffs and inorganic products were as low as 100 and 154, the index for organic chemicals was 580 and even reached 785 for basic organic products.

Investment by the chemical industry amounted to more than 5% of turnover at NF900 million against NF852 million in 1959 (\$184 million and \$174 million). Of this figure NF665 million was devoted to basic chemical products including fertilisers, compared with NF629 million in 1959.

Prices during the year were generally fairly steady. The total volume of



foreign trade, both exports and imports, rose from \$722 million in 1959 to \$923 million (28%) with exports up 25% at \$612 million. The proportion consigned to O.E.C.D. countries was particularly important, with the biggest increases going to Germany (shipments up 43%), Holland (41%), the Belgo-Luxemburg Economic Union (B.E.L.U.) (39%) and Italy (37%). Total imports in the same period rose 33% to \$311 million with above-average increases in arrivals from Canada (137% up on the 1959 figure), Germany (56%), Holland (39%), the U.K. (37%), and the B.E.L.U. (36%).

**Germany:** Output, valued at DM21,767 million (\$5,220 million), was 14% up on 1959 (DM19,137 million or \$4,590 million). Investment in the same period was up 41% at an estimated DM2,190 million (\$525 million) compared with DM1,555 million (\$373 million), the chief sectors concerned being petrochemicals, plastics materials and pharmaceuticals. Despite heavy demand (85% of total German chemical output was absorbed by national consumption) the price index fell 1% while the overall index of industrial prices rose 1.9%.

Imports of chemical products amounted to 36% against 20% in 1959, the greatest rise being in arrivals during the year from the U.S. (40% up on the 1959 figure). Imports of inorganic and organic chemicals, dyestuffs and pharmaceuticals showed the heaviest increase. Exports of all chemicals were 14% higher as against an increase of 18% in 1959 with exports to European countries showing the most marked advance and accounting for two-thirds of the total. The rate of increase of exports to North America and Asia was below average.

**Ireland:** Output of the Irish chemical industry has increased appreciably over the last two years. Though no figures for turnover in 1960 were available when the report was prepared, investment in 1960 was reported at £800,000 (\$2.2 million). Imports during the year rose from \$48 million in 1959 to \$51 million—an increase of 6%—while exports rose from \$1.4 million to \$2.4 million, or 4.7% of imports.

**Italy:** Turnover of the chemical industry in 1960 was L1,661 billion against L1,434 billion in 1959 (\$2,675 million against \$2,310 million). The industry's production index rose from 209 to 242, while the overall production index for Italian industry rose from 158 to 180. Apart from falls in output of calcium carbide and tartaric acid, all sectors showed a distinct expansion.

Investment in chemicals in 1960 was 18% higher than in 1959 at L190 billion against L160 billion (\$306 million against \$258 million).

**Holland:** Turnover increased from Fl.2,300 million in 1959 to Fl.2,590 million (from \$610 million to \$685 million). The figures available do not allow the determination of reliable production indices or investment figures.

Imports of chemicals were 23% higher than in 1959, particularly heavy increases occurring in imports from Italy (up 85%) and the U.S. and Canada (43%). During the same period exports increased by

only 7% due chiefly to the growing demand on the internal market, though rather more than 50% of the industry's output was exported altogether.

**Norway:** Figures for 1960 were not available when the report was prepared, but turnover was considered to be higher than in 1959 when it amounted to N.Kr.1,138 million (\$160 million). Export figures for most chemicals were higher than in 1959 except for calcium carbide, output of which was seriously affected by lack of sufficient water for hydro-electric requirements. Imports also increased.

**Portugal:** Overall production figures were not available but noteworthy increases in output were recorded for a number of products. Portugal's chemical imports in 1960 were taken almost exclusively from O.E.C.D. countries (88%), the most important being fertilisers (17% of the total), inorganic chemicals (13%), miscellaneous and organics (8%). Of Portugal's chemical exports in 1960 47% by value went to the other European countries, the chief export lines comprising manufactured fertilisers and pharmaceutical products.

**Spain:** Spain registered an outstanding increase in production of chemicals in spite of difficulties deriving from the liberalisation of trade, the application of the new customs tariff and the lack of suitable capital equipment. Total turnover rose from 33,950 million pesetas (\$565 million) to 34,300 million pesetas (\$570 million), an increase of about 1% while the index of production went up from 141 in 1959 to 153.

Foreign trade showed little change, accounting for 6% of Spain's total foreign trade. Imports made up 20% of the country's total imports.

**Sweden:** Turnover of the Swedish chemical industry in 1960 amounted to an estimated S.Kr.1,760 million against S.Kr.1,630 million the year before (\$340 million against \$315 million). Investment in chemicals during the year was an estimated S.Kr.133 million (\$26 million) or S.Kr.15 million (\$3 million) more than in 1959. Three-quarters of this investment was devoted to basic products.

Home demand increased 10% during the year and production capacity proved inadequate for requirements, necessitating a 20% increase in foreign supplies. Exports (\$75 million) were 12% higher than in 1959, the O.E.C.D. countries taking most of the increase. Imports went up 21% rising from \$195 million to \$233 million with the O.E.C.D. countries supplying 75% of the total increase.

**Switzerland:** Turnover of the Swiss chemical industry in 1960 was estimated at Sw.Fr.2,000 million (\$465 million). Exports, which absorb 80-85% of total production, amounted to \$363 million, a similar rate of increase to that registered from 1958-59 (20%). Main purchasing countries were Germany, Italy, France, the U.K. and the United States, the chief groups of products exported being organic chemicals (\$70 million), pharmaceuticals (\$111 million) and dyestuffs (\$97 million).

From 1959 to 1960 imports rose from \$178 million to \$216 million.

## Montecatini report success in most sectors in 1961

**S**HAREHOLDERS of Montecatini Co. were recently told that in 1960 the group produced 1,400,000 tonnes pyrites, and that sales were satisfactory. Recently the company introduced improvements, involving considerable capital, resulting in excellent results at the Gavorrano pyrites mine and Fenice Capanne cession.

In 1961, Italian sulphur output totalled only about 70,000 tonnes and, thus, accounted for only about 0.7% of the world's production (10 million tonnes). Montecatini's own production also dwindled to a modest figure (16,537 tonnes) owing to the exhaustion of the Formignano mine which has practically ceased its activity.

The Montecatini group's production of sulphuric acid reached a record figure for 1957-61 during the course of the year. The company's report, however, does not reveal the actual total and limits itself to stating that preference for concentrated acid is being intensified and that a substantial contribution will be given by the new pyrites plants at Searlino.

During the latter half of 1962, new processes will be used at the plants to go on stream at Follonica converting iron sulphides into iron ore and producing large quantities of highly concentrated sulphuric acid.

Despite difficulties, bauxite production remained on the same level as 1960. The sulphur sector is unsatisfactory and the company is shifting its labour into other branches.

In 1961 the group's potash mine at San Cataldo, Sicily, yielded 641,704 tonnes, about 72% of Italy's output. Preparatory work has been carried out at the Palo mine, next to San Cataldo.

Fluorospar prospecting at Prestavel (Trent) has given good results and during the current year a fully mechanised mine will start in this area.

Expectations concerning utilisation of phosphoric have not been fulfilled, it is reported, and thus output of phosphate fertilisers has slackened. The group's plants at Orbetello, Porto Empedocle, and Porto Marghera, producing complex fertilisers, have been expanded.

The cost of raw phosphatic materials cannot be reduced while the Government keeps down selling prices, it is stated.

The equipment and the organisation of the potassic fertiliser plant at Campo-franco (Sicily) have been stepped up and output of potassium sulphate and other potassium salts is increasing. Improvements are reported also in the nitrogen sector, 1961 production being 240,949 tonnes.

A 1961 new titanium oxide plant started at Spineta Marengo and its potential output can cover future needs.

# FIRST QUARTER FALL IN U.K. ACID PRODUCTION, CONSUMPTION

IF sulphuric acid is regarded as an accurate economic barometer, then British industry was operating at lower levels in the first quarter of this year, compared with a year ago. Of the big uses of sulphuric acid, only titanium oxide showed an increase in this period—lower consumption being shown for organic acids, bromine, dyestuffs, hydrochloric acid, iron pickling, oil refining, plastics, rayon, soap, sulphate of ammonia and superphosphates.

Compared with the first quarter, 1961, consumption in January to March 1962, at 675,009 tons of  $H_2SO_4$ , was down by 14,147 tons. Production, at 657,183 tons, was down 24,715 tons, while stocks at 31 March, totalling 113,058 tons, were up by 14,646 tons. The following are the quarterly returns published by the

## Sulphuric Acid and Oleum (Jan.—March, 1962)

Tons Stock, 1 Jan. Production	100% $H_2SO_4$ (New acid)		Total 120,449
	Contact 558,383	Chamber 98,800	
Stock, 31 March	655,952	121,680	777,632
Apparent use	565,453	99,121	664,574
Total capacity represented (tons/quarter)	675,180	135,500	810,680
Per cent of capacity in use	82.7	72.9	81.1

National Sulphuric Acid Association; these do not include Government plants.

## Consumption of Sulphuric Acid and Oleum

	Tons, $H_2SO_4$	
	January to March 1962	1961
Trade uses	9,499	10,177
Accumulators	3,355	3,282
Agricultural purposes	553	476
Bromine	4,007	8,068
Clays (Fuller's earth, etc.)	3,281	4,777
Copper pickling	735	802
Dealers	3,502	3,210
Dichromate and chromic acid	6,697	6,482
Drugs and fine chemicals	5,400	5,589
Dyestuffs and intermediates	22,283	25,884
Explosives	2,848	2,674
Export	398	1,220
Glue, gelatine and size	72	116
Hydrochloric acid	13,600	14,211
Hydrofluoric acid	7,457	3,973
Iron pickling (inc. tin plate)	31,009	31,912
Leather	1,310	988
Lithopone	3,009	1,644
Metal extraction	673	726
Oil refining and petroleum products	16,683	20,212
Oils (vegetable)	2,073	2,298
Paper, etc.	2,622	2,332
Phosphates (industrial)	596	777
Plastics, n.e.c.	13,992	14,786
Rayon and transparent paper	66,415	66,647
Sewage	3,401	3,265
Soap, glycerine and detergents	32,224	32,457
Sugar refining	140	197
Sulphate of ammonia	73,593	76,521
Sulphates of copper, nickel etc.	5,585	4,499
Sulphate of magnesium	35	47
Superphosphates and other phosphatic fertilizers	170,750	172,680
Tar and benzole	5,056	5,371
Textile uses	2,838	4,601
Titanium oxide	114,857	112,759
Unclassified	44,461	47,196
Total	675,009	690,856

N.B. All Government plants are excluded in these tables.

## B.T.L. awarded contract for CIBA Research Centre

A CONTRACT for laboratory furnishings in the new CIBA Research Centre, Bombay, has been awarded to Baird and Tatlock (London) Ltd., 14-17 St. Cross Street, London E.C.1, who have previously carried out a number of laboratory installations for the CIBA organization and its associate companies in the United Kingdom. In all 80 laboratories are involved in the new centre.

The furnishings supplied will be based on B.T.L. standard timber removable units. Special materials, components and assemblies, including prefabricated service units, fume cupboards and extract systems will be shipped from Britain and B.T.L. supervisors and engineers will be on site to control the whole operation, which is due for completion by the end of 1962.

## Acetylene Association's annual lunch

CANADA had 1,150 chemical plants employing 60,000 and the U.K. was second to the U.S. as her largest export market, taking supplies worth £12 to £15 million annually.

This was stated by Mr. B. C. Butler, Minister (Commercial) for Canada in London, when he proposed the toast of the British Acetylene Association at its annual luncheon in London on Tuesday. He paid a tribute to the president, Mr. A. W. Scott (Shawinigan Ltd.), who, he said, was the first Canadian to hold this post in 63 years.

Mr. Scott, responding, said he was sure the industry would have an interesting future.

## Gulf executive stresses importance of petrochemical industry economics

A PLEA that more attention should be given to the economics of petrochemical operations, in view of the increasing dominance of the organic chemical field by chemicals based on petroleum and natural gas was made recently by Dr. Alexander Lewis, Jnr., vice-president, Gulf Oil Corporation. Dr. Lewis was speaking at the International Chemical Market Research conference held at Chateau de Menars, Loir-et-Cher, near Blois, France. The conference was sponsored by the U.S. section of the Societe de Chimie Industrielle.

Dr. Lewis defined the main economic factors affecting the petrochemical industry as: Choice and cost of raw materials; construction and equipment; labour and social; fuel and operating materials; administration and research; distribution and promotion, including technical service; depreciation, taxes, financing and profits.

Dr. Lewis discussed the influence of those factors on the production of ethylene, benzene and propylene, pointing out that both Japan and Europe had lower labour and construction costs, but

higher fuel costs than did the U.S.

Many important differences were revealed in feedstock type, price, availability and market patterns. It was only by analysing carefully those economic factors for each venture on a basis that was applicable over the life of the project that the most advantageous project and plant location could be determined.

Under the more competitive climate that could be expected within the Common Market, the advantages of high debt to equity financing could be expected to decrease and the risks to mount. Over the next 10 years, Dr. Lewis felt that closer ties would develop among all the industrialised areas of the free world, particularly between Europe, North America and Japan. In such an environment, it became more vital that new chemical ventures be based on sound, long-range economic principles that derived maximum benefit from the individual advantages of any given producer.

He was sure that the next decade in Europe should be a rewarding one for those who gave adequate consideration to economic and market factors.

## Hydrocarbon Oil Duties (Drawback) Order

The Hydrocarbon Oil Duties (Drawback) (No. 3) Order, operative as from 30 April, provides for the allowance of drawback of customs or excise duty paid in respect of hydrocarbon oil used in the manufacture or preparation of certain self-adhesive plastic sheeting.

## I.C.I. look for moderate profit improvement

(Continued from page 768)

appreciably higher than those of 1961. If the drop in profits in 1961 had been due to falling turnover, an improvement in 1962 might have been spectacular but with the 1961 results depending on falling profit margins the main source of additional profits this year must be sought in improved margins due to greater efficiency. "In the nature of things, any improvement in profits achieved in this way is likely to be moderate," Mr. Chambers said.

In the first quarter, total turnover was a little above the same quarter in 1961. In the case of Terylene, which did well in 1961, exports in the first quarter of this year were nearly 20% higher as just over £4 million.

# U.K. PRICE POLICY, TECHNICAL SERVICE CRITICISED BY EXPATRIATE CHEMIST

**A**N expatriate British chemist now working in Italy, writing on what he believes to be some of the failings of the British chemical industry, tells *CHEMICAL AGE* that the price of chemicals in this country is generally higher than in the Common Market.

His views are controversial and because they will be of general interest, they are published below:

"While in recent months prices in the U.K. have tended to decrease following a distinct pattern, this is not the case on the Continent, where prices are still fluctuating widely in order to sell chemicals that are over-produced.

"The present time is not an opportune one for U.K. buyers to make firm contracts for longer than a few months. It pays buyers to purchase odd parcels on the Continent at low prices and take up the remainder of their requirements from home-produced chemicals.

"Many chemicals are now available from the Soviet Union and the Far East at very low prices. Most of the merchandising of these products is currently taking place in Italy and of particular interest are Soviet petrochemicals which are available at extremely low prices.

"West Germany has become an important source of East German products because the Eastern Zone's economy is in dire straits with the East German mark being valued at only 20 to 25% of the DM in the free market.

"Low-priced British chemicals are also available on the Continent and cases have occurred recently where it has paid to buy a British material in Europe and re-export to Britain. British manufacturers who are trying to export chemicals to Europe at a delivered price that is made up of the home market price plus a surcharge to cover shipping, insurance, duty, etc., find that their prices are considerably higher than those offered by Continental producers.

"What British manufacturers must do to keep in the European market is to charge a price that is competitive in the country concerned, but not so low that the goods are re-exported back to the U.K. In many cases, such a policy would also mean reducing the home price. This might not be as uneconomic as it sounds since it would ensure to a greater degree that plants are working to capacity, that is provided both quality and technical service are sound.

"But technical service from British chemical companies is a variable quantity in Europe. Some companies offer first-class facilities, visiting their customers as frequently as their German counterparts. In other cases, technical service is virtually non-existent.

"Some companies send out representatives from the U.K. who have a good knowledge of prices, but who have no technical knowledge of the products they

are trying to sell. If the price is correct, it is the technical service which sells a product, not the commercial salesman.

It is surprising that in medium tonnage chemicals, little of novelty is being offered by British chemical companies. Most of the new products are in this range are coming from U.S. companies and to a lesser extent from German firms. It is all very well for the directors of British chemical groups to excuse themselves by saying that the population of the United Kingdom is only a fraction of that of the U.S., but to judge from patents alone, even the Japanese appear far more virile in the production of new ideas.

"Perhaps it is an attitude of mind that is wrong. The development of chemicals

possibly suffers from being in water-tight compartments in Britain. A product tends to be developed for a particular application and if it is unsuccessful in that application it is often discarded. More specialists are needed in a wide variety of fields for the development of applications.

"Directors often complain that they cannot get the specialist staff that they need for this type of work, but it is more correct to say that they do not get them because they will not pay the rate for the job.

"Many technologists have left Britain or contemplate doing so simply because the salaries offered abroad and, in many cases, the working conditions, are superior to those available in the U.K."

## Complications of Common Market reviewed by B.C.P.M.A.

**I**F the U.K. became part of the Common Market the chemical plant industry would expect increased competition in the home market but, on the other hand, increased opportunities for trade in the much larger European market. This, in brief, summed up the views of the British Chemical Plant Manufacturers' Association, as expressed at the last annual meeting and reiterated in the annual report for 1961.

Action by individual firms, it was stated, would vary according to whether they were complete contractors, unit plant manufacturers or fabricators. Some members had established links with firms on the Continent and were already reaping the benefit.

The council subsequently decided to set up a European trade committee to consider the pattern that the association's activities should take if and when the U.K. joined the C.M. The trade committee was specifically asked by the executive committee to review B.C.P.M.A.'s relations with other associations in Europe and to recommend in which directions they might most usefully be fostered, to review the association's services in connection with European trade as well as to recommend the type of information which it should seek to collect and circulate to members to assist them in exporting to Europe, and to consider what help could be given to members to meet the increased competition likely at home if the U.K. joined.

The committee held its first exploratory meeting under the chairmanship of Mr. Peter Seligman (A.P.V. Co. Ltd.) toward the end of the year and concluded that in the event of the U.K. becoming a member the immediate oppor-

tunities would be for unit plant manufacturers rather than for chemical engineering contractors or fabricators. Its 1962 plans include staff visits to Europe, the preparation of European reports and consideration of publicity in Continental markets.

Value of 1961 exports of chemical and allied plant was much greater than in 1960 and 1959, due almost entirely to notably increased 'gas and chemical machinery' shipments. The figures under this category were: (all £ million) 1959, 5.44; 1960, 3.89; 1961, 8.46. Largest 1961 consignments, in order, were to the U.S.S.R., India, Italy, Australia, Argentina and Eire.

Dealing with delivery problems, including stainless steel, the report said the question of standardisation and use of alternatives was being examined by the joint committee representing the association and the Association of British Chemical Manufacturers. The committee welcomed the announcement late last year of plans for considerably expanded stainless steel production in the sizes and thicknesses required. The need for a closer relation between supplier and customer at all levels had been stressed at talks. Following the association's energetic tackling of the whole problem of deliveries, the committee hoped the issue would cease to be a bone of contention between the industry and its customers.

### Obituary

**Dr. David Doig Pratt**, 68, who retired in 1959 from the position of director of the D.S.I.R. National Chemical Laboratory, died suddenly on 5 May. He joined the laboratory on its inception in 1925 and became director in 1951.

## French chemical industry

# Natural gas makes France second largest sulphur producer

EXPANSION of the French chemical industry was the theme of a paper given by Professor L. Jacqué at a meeting of the London Section, Society of Chemical Industry, on 7 May.

Taking 1935 as 100, the production index for chemicals in France in 1960 was 286, compared with 165 in the U.K., and 147 in the U.S. The German chemical industry, which faced similar problems of build-up after the war, has reached a level of expansion which is about 4/5 of that in France.

Again as with the chemical industry in other countries, plastics have shown the most marked expansion. Index for plastics in 1961 (1952=100) was greater than 900. Chemicals as a whole was 326 and the organic sector reached an index of 700. The index for all industry was 184. Value of chemical production in 1961 was about NF10 million and by 1965 it is expected to be NF14.8 million.

France has large resources of oil and natural gas which are the main source of raw materials for the chemical industry. The Franc zone produced 18,679,100 tonnes of crude oil in 1961 and the Lacq gas field alone produced over 4,000 million cu. m. of refined natural gas in the same year. Consumption of petroleum products in 1961 was

	1961	1965
	'000 tonnes	
Sulphuric acid ... ..	2,200	2,900
Chlorine ... ..	380	600
Hydrochloric acid ... ..	322	406
Caustic soda ... ..	570	695
K fertilisers ... ..	1,650	1,700
N+P <sub>2</sub> O <sub>5</sub> +K <sub>2</sub> O ... ..	1,318	1,516
Ethylene ... ..	105	250
Propylene ... ..	156	250
Butyl rubber ... ..	21.2	27
Polybutadiene rubber ... ..	1.2	60
SBR ... ..	42	85
Carbon black ... ..	68	98
Phthalic anhydride ... ..	32	76
Trichloroethylene ... ..	81	110
Synthetic phenol ... ..	65	86
Styrene ... ..	35	117
Methanol ... ..	105	156
	1960	1961
	tonnes	
Plastics ... ..	332,550	420,000
Polythene ... ..	35,000	—

over 25 million tonnes. Refining capacity at the end of 1961 was 44 million tonnes and will increase over the next few years with refineries due on stream at Strasbourg and in the Paris area.

Prospects are equally favourable for natural gas. The development of the natural gas fields has been a triumph for the metallurgical industry. Due to composition of the gas and the pressure of the reserves, corrosion has been a difficult problem. It has been the work of the metallurgists that have solved these problems. The bi-product sulphur of the gas fields, production of which

reached 1.4 million tonnes in 1961, gives France a place in the world for sulphur output second only to the U.S. and equal to Mexico.

The Saharan field has reserves of 1,000,000 million cu. m. After local needs have been met, the greater part of this will be distributed as far as possible in Europe.

With new raw materials available investments in the French chemical industry is going ahead. It now represents on an average 8% of turnover and as much as 15% for some of the larger firms. Total investment in 1961 was NF1,160 million. New tax laws are being introduced which will encourage the re-investment of profits.

Research and development accounts for 3 to 5% of turnover but to remain competitive in some fields it has been necessary to import know-how from the U.S. and the U.K. For instance polythene production in France was initially by the I.C.I. high pressure process, but now most polythene produced is of the high density variety.

Development of new processes is going ahead rapidly. Les Fabrique de Produits Chimiques de Thann et de Mulhouse has come on stream with a titanium oxide plant based on a chloride process.

The structure of the French chemical industry is somewhat different to that in other countries. The 10 top firms in France are responsible for only 1/10

of the total turnover compared with Germany where the three largest firms make 1/3 of the total turnover. In Italy, one company, Montecatini, accounts for half of the Italian turnover in chemicals.

Big French companies have not merged to form larger units as in the U.K. and U.S., but instead have made up a complex system of common subsidiaries. Rate of expansion in the next four years is expected to be 32% (6.9% annually) in inorganic chemicals and 53% (11.2% annually) in organic chemicals.

## S.C.I. group visits Pfizer's Sandwich plant



Mr. L. M. Miall (right), head of the medicinal chemicals process development department, describes to the chairman of the fine chemicals group of the S.C.I., Dr. A. C. C. Newman, part of the Pfizer pilot plant, Sandwich, Kent, during a recent visit by some 60 group members

## Associated Chemical plan Indian unit for sodium hydrosulphite manufacture

PLANS for future capital expenditure by Associated Chemical Companies Ltd. include the setting aside of £375,000 towards a project, now awaiting sanction by the Indian Government, for the manufacture of sodium hydrosulphite and related products in India. The sum will represent a 25% holding of the equity of a new Indian company to be set up in association with Kilachand Devachand, of Bombay.

This is revealed by Mr. J. C. Hutton-Wilson, chairman of Associated Chemical, in his statement to shareholders circulated with the company's accounts for 1961. Mr. Hutton-Wilson also reports a drop of 11% in the value of total sales of industrial chemicals during the year. Sales volume fell by some 4% from the 1960 record, due to continued uncertainty in the markets, which affected sales in some sections of the home front and to countries utilising import licensing as a means of regulating

their economies and foreign currency positions. The lower earnings were a result of the lower sales volume, price cuts in the home market introduced in July 1962, and continued pressure on prices overseas.

On the other hand, sales of fertilisers and animal feeding stuffs continued to advance, though again the company had to meet considerable pressure on prices.

These factors and increased prices of some raw materials caused profits to fall from £1,471,447 in 1960 to £1,351,773. "The effect would have been much greater had it not been for the reductions in cost of production which are now being progressively attained as a result of the capital expenditure in recent years on modernising our plants and processes," Mr. Hutton-Wilson declares.

Capital expenditure in 1961 amounted to almost £900,000, of which more than half was spent on the modernisation of the chromium chemicals plants.

## Overseas News

# D.S.M. COMMISSION HOLLAND'S FIRST FORMALIN PLANT

THE Dutch State Mines have recently commissioned a formalin plant, the first in Holland, at the Polychemie Works, Beek. Construction was started in October 1961 under the supervision of Chemiebouw, the D.S.M. engineering office. The plant was completed within six months; annual production will be 25,000 tonnes of formalin, a solution of 40% by volume of formaldehyde in water. The plant came on stream without difficulties.

Formaldehyde is a major base material, used with phenol, urea melamine, etc., for the manufacture of thermosetting plastics. Until now D.S.M. had only produced thermoplastics, notably high-pressure and low-pressure polythene and caprolactam.

Urea has been made by D.S.M. for some years, both for use in fertilisers and in industrial applications such as resins and glues. Early in 1962 a start was made with pile driving for the phenol plant of N.V. Staatsmijnen-Dow Fenol at Botlek, Rotterdam.

### Polybutadiene rubber price reduction

The price of polybutadiene rubber has been reduced by 2½ cents a lb. to 27½ cents by Firestone, Goodyear and American Synthetic Rubber who market polybutadiene rubber for American Rubber and Chemical. The cut follows a similar one by Phillips Chemical made recently (see CHEMICAL AGE, 28 April, p. 685).

### B.A.S.F. polystyrene plant planned in Australia

One of W. Germany's three leading chemical companies has decided to establish a plant to manufacture expandable polystyrene in Australia. This is the first capital investment there by Badische Anilin- and Soda-Fabrik, of Ludwigshafen. A decision will be made shortly on the location.

### Esso may have Lavera's fourth oil refinery

Esso have asked the French authorities for permission to build a refinery at Fos-Sur-Mer, near the port of Lavera, where the south European pipeline begins. It is reported work will begin in 1963, and finish in 1965, eventual capacity being about 4 million tons.

There are already three refineries near Lavera, belonging to B.P. Shell and C.F.P., which between them treated 12 million tons in 1961. France plans to add 12 million tons to refining capacity under the 1962-65 plan, but 7 million

tons is already accounted for by the two refineries to be built at Strasbourg at the head of the south European pipeline, and part of the rest by plans for two refineries, one near Lyons and one near Paris, by the state controlled Union Générale des Pétroles.

### Carbon black plant for Greece

First Greek factory for producing lampblack for use in tyre manufacture is to be built by the firm of G. Karapoulos using a loan of \$1.6 million negotiated in Germany. Annual output will be some 2,000 tons and it is estimated that the new Pirelli tyre factory at Patras will use about 1,750 tons/year.

## Shell due on stream shortly with Italy's first hydrocarbon aromatics plant

SHELL Italiana's new aromatics plant will shortly go on stream with initial capacity for 130 tonnes/day at Condor Oil at the Condor refinery, Rho, near Milan. Of the capacity, 75 tonnes will be benzene, 20 tonnes of toluene and 25 tons of xylene.

The new Shell-developed process produces high-purity aromatics from a naphtha stream via a 'medium platformer' unit and a specially developed solvent, Solfolano.

Shell are first in this field in Italy, but other petroleum-based aromatics producers will provide competition. Mobil Chimica Italiana have under construction a much bigger 130,000 tonnes/year plant at Naples. More than 75% of output will be represented by benzene and *o*-xylene; the remainder will comprise benzene, ethylbenzene and *p*-xylene.

Production has been hinted by the groups now developing chemical facilities in Sardinia, but no definite announcement has been made. Montecatini are to build a large aromatics plant at Brindisi for benzene, toluene and xylenes, plus a 25,000 tonnes/year petro-naphthalene plant.

### Three fertiliser plants planned in Spain

Fertilizantes de Iberia, a company formed by the Banco de Bilbao, Spain, and International Investment of the Bahamas, with an initial capital of 1,200 million pesetas, half of which is held by the foreign concern, have applied for

### More details of A.I.A.G.'s plans in Switzerland

More details of the plastic production plans of the Swiss aluminium concern Aluminium-Industrie-AG (A.I.A.G.), of Chippis ('Overseas News' 5 May), are now available. In Switzerland itself the company has set up at Zurich, a company called Cheminvest AG; this has a capital of S.F.500,000 and will act as a subsidiary holding company for the plastics production sphere. In Italy a plant has been purchased near Bergamo for the production of raw materials for the manufacture of plasticisers and plastics, while a plant for the processing of polyolefins has been bought in Holland.

### Du Pont expanding their Australian marketing operations

Du Pont, of America, have announced plans to expand their marketing operations in Australia. Behr-Manning (Australia) Pty. Ltd. have become sole Australian distributors for Du Pont cellulose packaging and industrial films. Dupont's Sydney representative, Mr. P. H. Ehrlich, said the Australian company of Behr-Manning would market over 100 different types of Dupont cellulose film.

authorisation to install three fertiliser plants. Equipment will cost 2,400 million pesetas. Combined annual production of the plants, to be built in the north-west (at a cost of 887 million pesetas), Huelva (489 million pesetas), and the Levant (542 million pesetas), will be 75,000 tons urea, 45,000 tons ammonium nitrate, and 163,500 tons complex fertilisers. Imports will include machinery worth 1,000 million pesetas and 165,000 tons phosphoric rock.

### Goodyear's new polybutadiene to go into full production

The chemical division of Goodyear Tire expect to go into full production with their new *cis*-polybutadiene, Budene, at their Beaumont, Texas, plant. The new synthetic rubber can be used to make conveyor belts, shoe soles and tyres. Goodyear are also starting up their Natsyn polyisoprene plant at Beaumont.

### Italy's expanding production of detergents

Italian production of detergents and soaps in 1961 totalled about 325,000 tonnes, of which soaps represented 190,000 tonnes. Output of detergents is continuing to expand at a faster rate than production of soap. The above figures do not include about 25,000 tonnes of scented soaps.

## Overseas news

# Albert/S.I.R. combine will give Italy new source of epoxies

EPOXY resins are now available in Italy from five different sources, all of which are imported. But plans have now been announced to build a plant for epoxies in Sardinia to come on stream in 1963. This plant is a joint undertaking by Chemische Werke Albert of Wiesbaden and Soc. Italiana Resine.

At present S.I.R. are selling the Albert made resin but considerable stress is made of a home produced product with a possibility of a lower price. This prospect of a lower price is particularly attractive to Italian industry as the current high price of epoxies is said to have prevented their wider use.

The potential rate of increase of usage is high, especially with the interest being shown by the car manufacturers for primers based on epoxy resins. The rapid rate of growth of the domestic appliance industry in Italy will also help the consumption.

Probably one of the reasons for the comparatively slow development of the use of epoxies in Italy has been the lack of technical service facilities available. The S.I.R.-Albert development will include facilities of this type.

## National Distillers and Chemical buy fertiliser plant

The Federal Chemical Co. division of the U.S. company, National Distillers and Chemical Corp., have bought a fertiliser plant formerly operated by the Bennett and Clayton division of Unexcelled Chemical Corp. The plant is sited at Cranbury, N.J.

## Kanoria planning 21.6 m. rupee expenditure on chemical project

Plans by the Indian chemical company Kanoria Chemicals and Industries Ltd. to construct a plant for the production of sodium lye, liquid chlorine and technical hydrochloric acid, technical aid for the project to be provided by the Swiss concern Krebs and Co. AG, of Zurich (see CHEMICAL AGE, 23 September 1961, p. 440) will cost some 21.6 million rupees altogether. Of this sum, 16.8 million rupees is accounted for by machinery and plant, which is to be supplied by both Indian and foreign firms. The imported units will come from Switzerland and the United States. For the purchase of the American plant, the Industrial Finance Corporation of India has guaranteed Kanoria credit totalling some 3.7 million rupees.

## Vondelingenplaat mercaptans plant contract for Badger

A contract for the engineering and construction of a plant for manufacturing heavy mercaptans has been awarded to Badger N.V., of The Hague, by N.V. Fabriek van Chemische Producten Von-

delingenplaat, Rotterdam. The unit, which is being constructed for Vondelingenplaat in co-operation with Pennsalt Chemicals Corporation, will use a Pennsalt process for the manufacture chiefly of tertiary-dodecyl mercaptan.

A statement issued this week says that engineering is already essentially complete and construction has now started on a site adjacent to Vondelingenplaat's existing plant in Rotterdam's Pernis area. Production is due to start in the last quarter of this year.

# A.N.I.C. vinyl acetate monomer plant will be on stream this year

OUTPUT of the plants of A.N.I.C. (E.N.I. Group) at Ravenna increased in 1961, both for synthetic rubber (up 23%) and nitrogen fertilisers (12% in terms of nitrogen content). Increases also are reported in the sales of the same products (21.9% and 26.4% respectively).

During 1961, the company started producing polybutadiene under the name of Europrene Cis. and before 30 June 1962, a new plant of theirs will begin producing carbon-black rubber. Erection of new plants for the production of special polymers and vinyl acetate monomer has continued and the production of the latter will be started during the coming year.

Construction of a petrochemical plant that will yield plastics materials, solvents and synthetic fibres, is being continued at Pisticci in Southern Italy.

During 1961, plans were worked out for a new petroleum refinery which A.N.I.C. will build at S. Nazzaro de Burgondi (not far from Pavia). This refinery will be fed by the Central-European Pipeline which is now being built and it will have a capacity of 5,200,000 tonnes a year.

## U.S. firms to license starch phosphate production

International Minerals and Chemical Corporation and American Maize Products Co. have reached an agreement on the overseas licensing of starch phosphate production. I.M.C. will be the sole licensing agents under the agreement, while American Maize will provide research and process know-how to

## Conoco plan new Po Valley refinery

Continental Italiana, an affiliate of Continental Oil Co., set up recently in Milan, have applied to the Italian Government for permission to build a new oil refinery in the Po Valley. This refinery is to consist of a 3,900,000 tonne topping unit, 400,000 tonne platforming plant stabilisation, desulphurisation, recovery of LPG etc.

The new refinery will be linked with the Ligurian coast by a 72-mile 12½ in. pipeline which will be able to carry 2 million tonnes of oil a year.

## 1961 Fertiliser Production in France

Production figures for some fertilisers in France in 1961 are as follows:

Nitrogen	tonnes of N
Synthetic urea	31,395
Complex and miscellaneous	112,825
Recovered ammonium sulphate	27,350
Phosphate	tonnes
Superphosphates	1,307.4
Ground phosphates	610.6

overseas licence holders.

I.M.C., who hold patents in this field, believe that starch phosphate will provide a large new usage for starch.

## E.E.C. seeks changes in potash industry

Changes in the present French and Italian state monopoly companies are being sought by the Commission of the European Economic Council to end current discrimination against potash fertilisers. The French and Italian Governments are being asked to set 1962 potash import quotas at 5% of 1960 production and to raise this quota by 15% a year thereafter.

## Pharmaceuticals figure in Franco-Monagasque break

The French Government has reserved the right to raise import duty or even an import ban on pharmaceuticals produced in Monaco within a period of three months. Pharmaceutical firms based in Monaco, among them a subsidiary of the Bayer concern, have a total annual turnover of some NF20 million.

## Du Pont and heavy water

Du Pont of Canada are studying the possibility of building a multi-million dollar plant to produce heavy water for nuclear reactors. The study is "at an extremely early stage" and no definite decision to build the plant has been taken.

## German Industries Fair

# INTERESTING NEW CHEMICAL PRODUCTS SHOWN AT HANOVER

A NUMBER of interesting new chemical products were shown at the German Industries Fair held in Hanover from 29 April to 8 May. A total of 138 exhibitors, all but eight of them from Federal Germany, took space in the new 183,600 sq. ft. chemical and plastics display hall, the following firms with novelties of particular interest on show.

*Badische Anilin- und Soda-Fabrik AG*, Ludwigshafen-on-Rhine, introduced a new plastics base under the name of Luran; a copolymer based on styrene-acrylonitrile this is used in Polystyrol 52 for the production of high-value industrial goods as well as for household goods such as crockery and cutlery.

In the realm of textile chemicals, B.A.S.F. showed their new development B.A.S.F.-Chlorierungsmittel DC, with which the felting of wool can be reduced by an 'unusual' extent without advantageous properties of the wool being harmed, and Fixapret PH, a crease-resistant agent for cotton goods, permitting crease resistance even with boiling and after-wash smoothness without ironing. Other new products included Floranid organic nitrogenous fertiliser of novel composition and long life.

*Chemische Werke Hüls AG*, Marl, showed a large-scale container of some 2,000-litre capacity made of the company's Vestolen A low-pressure polythene, the unit possessing a low-weight, good resistance to chemicals and pressure resistance up to 3 atm. This material may be used for containers with capacities of up to 50,000 litres.

### Anti-static quality

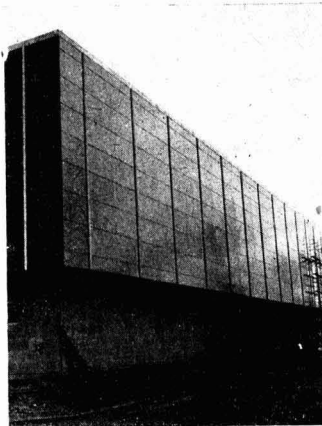
A particular novelty here was Vestolen in an anti-static quality, thus avoiding the charging with static electricity and consequent attraction of dust of such plastics products as lampshades and shop-window display material.

The partial subsidiary of *Chemische Werke Hüls*, *Bunawerke Hüls GmbH*, showed for the first time industrial goods and lorry tyres made from Buna CB, the 1.4 cis-polybutadiene rubber from the *Bunawerke plant*.

*Deutsche Gold- und Silberscheideanstalt (Degussa)*, Frankfurt-on-Main, showed a new filling agent, *Degussa-Füllstoff R 972*, a hydrophobic silicic acid whose commercial-scale production is to begin within the next few weeks. With a high degree of water repulsion, this is intended for addition to rubber and plastics materials in the cables and insulating fields and for use in the production of silicic gel fats.

Newly-developed syntheses for asparagic acid and its potassium and magnesium salts were offered for medicinal purposes.

*Dynamit Nobel AG*, Troisdorf/Bezirk



The chemical exhibits hall at Hanover with its 43,200 sq. ft. plastics facade

Cologne, introduced Trolen DUR, a carbon black-filled, cross-linked polythene with good chemical and ageing resistance and able to be processed like a heat-hardened moulding compound, and Trolitan 1200, a high heat-resistance moulding compound of particular interest to the electrical industry and available as unfilled resin or moulding compound.

*Farbenfabriken Bayer AG*, Leverkusen, included among new products on their stand, *Novodur PM* and *Novodur HG*, two additions to the range of ABS-copolymers combining improved flow properties and better heat and bend resistance with better surface shine of injection mouldings, improved pressure hardness and very considerably improved mechanical properties at low temperatures.

Elsewhere in the plastics field, *Bayer*

showed crockery, cutlery and other household goods made of their polycarbonate Makrolon and a new polycarbonate electric insulation foil entitled Makrofol KG, incorporating improved mechanical properties.

*Farbwerke Hoechst AG*, Frankfurt-on-Main, presented a new form of their Trevira-hochfest fibre which in coated form can be used for containers for water, liquid foodstuffs, petrol, gas etc., a storage tank for some 353 cu. ft. weighing no more than some 198 lb. Also on show was the new thermoplastic Hostaform C, to be produced by the *Ticona Polymerwerke GmbH*, a joint venture of *Hoechst* and *U.S. Celanese*.

*Schering AG*, Berlin, showed a particularly interesting range of polymerisation catalysts for the petrochemical industry. This included aluminium triisobutyl and monoethyl aluminium dichloride, as well as aluminium triethyl for lower olefins, diethyl aluminium chloride as a cyclisation polymerisation catalyst and the olefin catalyst diisobutyl aluminium hydride.

### Courtaulds reorganise group research facilities

DECISION to concentrate research on petrochemicals and plastics in a new British Celanese laboratory due to be completed by September at Spondon has been made by *Courtaulds Ltd.* Work in these fields at smaller research units at Spondon and at Putteridge Bury, near Luton, will be transferred to the new laboratory.

*Courtaulds* are also to transfer the work on basic research now being done at Maidenhead to their new laboratories at Coventry. This will ensure closer liaison between basic and applied research staffs and will enable full advantage to be taken of the wide range of facilities available in Coventry. The transfer of staff and equipment, scheduled to begin during the summer, will be completed by the autumn of this year.

After 30 September, correspondence should be addressed to the *Basic Polymer Research Group, A*, and *S.F. Laboratory*, *Courtaulds Ltd.*, Coventry, in place of Maidenhead, and to the *Research Laboratory*, *British Celanese Ltd.*, Spondon, in place of Luton.

## A.D.L. report reviews five years' work

ANNUAL report of the *Arthur D. Little Research Institute*, *Musselburgh*, for 1961, published recently, reviews the institute's work during the five years since it was set up, in 1957, in co-operation with *Arthur D. Little Inc.*, of Cambridge, Mass. In the intervening period it has grown at an annual rate of approximately 20% and, although its early income was derived largely from U.S. companies, only 36% of its present income is in dollars—the remainder being in European currencies.

Investigations completed and in hand include much work on the chemistry of plant materials—glucose, sucrose, wood and plant proteins. As a means of re-

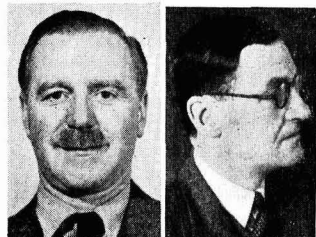
lieving the surplus of cereal grains and starch rich crops, work for the U.S. Department of Agriculture has resulted in the preparation and patenting of nylon type polymers, while a study of the chemistry of the sodium sucates has turned up potentialities for their use in insecticides, surfactants and polymers.

Other projects include the chemistry and polymerisation of ethylene sulphide, the hydrogen embrittlement of steel, and the reaction between aluminium and steam at high temperatures. At the end of the year plans were well-advanced to start work on the cross-linking of cotton, the reaction between molten glass and metals, and new type graft polymers.

● **Dr. B. K. Davison**, has joined the International Nickel Co. (Mond) Ltd. as a development chemist in the development and research department. He was previously organic research manager at Hardman and Holden Ltd., Manchester, and earlier was with I.C.I. Billingham and the Imperial College of Tropical Agriculture, Trinidad.

● At the annual meeting this week of the London Section, S.C.I., the officers were re-elected, with the exception of **Mr. H. L. Bennister** (Shell Chemical) hon. assistant secretary who replaces the late Mr. F. E. Salt, hon. secretary. New committee members are **Dr. J. A. Gardner** (Monsanto), **Dr. A. E. Davies** (Laporte), **Mr. A. J. Gait** (Shell), and **Dr. M. Peer** (Albright and Wilson).

● **Mr. Avison Wormald**, former joint managing director of Fisons Ltd., has been appointed chairman of Grace Brothers Ltd., Glen House, Stag Place, London S.W.1. merchants and shipping agents and chief U.K. subsidiary of W. R. Grace and Co., New York. (See also 'Distillates'.)



A. Wormald R. W. Rutherford

● **Mr. R. W. Rutherford** has been elected chairman of the British Chemical Plant Manufacturers' Association for 1962/63, in succession to **Mr. Norman Fraser**. Mr. Rutherford is managing director of the Power-Gas Corporation Ltd., chairman of Nuclear Chemical Plant Ltd., and a director of Davy-Ashmore Ltd., Davy-Ashmore Export Co. Ltd. and Chemical Works Projects Ltd. The following were elected to fill five vacancies on the council: **J. Bishop** (managing director, Nordac Ltd.); **G. V. C. Davies** (assistant managing director, Humphreys and Glasgow Ltd.); **J. A. W. Gill** (director, Steele and Cowlishaw Ltd.); **Wm. Stockdale** (chairman, Stockdale Engineering Ltd.); **B. H. Turpin** (managing director, Q.V.F. Ltd.). The following officers were elected by the council: vice-chairmen, **P. D. Doulton** (joint managing director, Matthew Hall and Co. Ltd.); **B. N. Reavell** (chairman, Kestner Evaporator and Engineering Co. Ltd.); **P. W. Seligman** (deputy chairman and managing director, the A.P.V. Co. Ltd.); hon. treasurer, **H. W. Fender** (vice-chairman and managing director, Prodorite Ltd.).

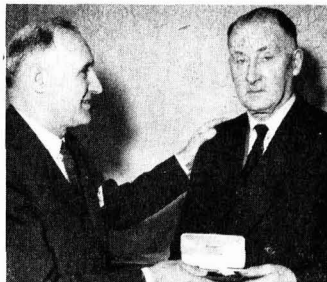
● **Dr. M. Barent** (Barent and Johnson) has been elected chairman of the Association of Consulting Scientists. Other officers are: Vice-chairman, **Mr. F. G. Sarel Whitfield** (Avebury Research

## PEOPLE in the news

Laboratories Ltd.); hon. treasurer, **Dr. G. W. Ferguson** (Parry and Ferguson); hon. secretary, **Mr. W. H. Stevens** (W. H. Stevens); Council, **Dr. H. H. Chambers** (Sondes Place Research Laboratories Ltd.), **Dr. G. P. L. Miles** (G. P. L. Miles), **Dr. R. F. Milton** (R. F. Milton), **Mr. H. Pritchard** (H. Pritchard) and **Mr. A. N. Worden** (Huntingdon Research Centre).

● **Mr. P. Keddie** has been appointed deputy chairman of John Wyeth and Brother Ltd. in addition to his position as managing director. Two senior Wyeth executives have also been appointed directors—**Mr. L. A. Atkins** and **Mr. J. D'Este Eastes**.

● **Mr. D. V. House** resigned as from 30 April from the board of McKechnie Brothers Ltd. consequent upon his appointment as a lay member of the Restrictive Practices Court.



The last working founder member of **T. Giusti and Son Ltd.**, stainless steel plant manufacturers, has just retired at the age of 75. He is **Mr. Fortunato Musso** (right), a craftsman from Italy who joined the company when it was founded in 1918 and who is seen here being presented with a gold watch to mark the occasion by **Mr. R. B. Giusti**. After nearly half a century in England **Mr. Musso plans to return to his native Turin**

● **Mr. C. E. Wildman**, manager of the chemical sales department of the International Nickel Co. (Mond) Ltd., London, has on medical advice retired on pension from active service. He began with Henry Wiggin and Co. Ltd. in

October 1913, and is one of the few to have had more than 48 years' service with the organisation. The chemical sales department is to be merged with the metal sales one under the general management of **Mr. P. J. R. Butler**.

● **Fisons Ltd.** have announced the following new appointments to the boards of Benger Laboratories Ltd. and Genatosan Ltd. The new Benger appointments are **Mr. C. E. Horton**, chairman; **Dr. R. Powell**, formerly general manager, now managing director. **Mr. H. P. P. Hodgkins**, of Genatosan, also joins the board. Following his recent appointment as executive vice-chairman of Fisons, **Sir John Carmichael** has resigned as deputy chairman of Benger. Three departmental managers have been appointed to the board of Genatosan: **Mr. J. Valentine**, marketing director; **Mr. J. P. Scott**, works director, and **Dr. J. S. G. Cox**, development manager. **Dr. Powell**, of Benger Laboratories, has also joined the board. The cross-membership on the boards is to facilitate greater co-operation between the two subsidiaries. The managing director of Benger Laboratories, **Dr. Powell**, is on the Genatosan board and the chairman and managing director of Genatosan, **Mr. Hodgkins**, will be on the Benger board.

● **Mr. S. C. Dawson**, commercial works engineer of I.C.I. Billingham Division since 1958, has been appointed projects services manager in the division's engineering projects organisation.

● **Mr. Andrew Phillips**, managing director of Fine Dyestuffs and Chemicals Ltd. has joined the board of the parent company, **A. B. Fleming (Holdings) Ltd.**, Glasgow.

● **Mr. J. W. Meredith**, who has resigned as managing director of Huntington Heberlein and Co. Ltd., one of the Simon Engineering Group, will continue as a director. **Mr. R. J. Jennings**, appointed a director of Huntington Heberlein in 1950, has been appointed managing director.

● **Mr. Thomas S. Smith** has been appointed a director of Hickson's Timber Impregnation Co. (G.B.) Ltd., Castleford, Yorks.

● **Mr. Arthur H. Geil**, managing director of Du Pont de Nemours (Nederland) N.V., will return to the U.S. in August to rejoin E. I. du Pont de Nemours and Co., in Wilmington, Del., where he will become director of the Orlon acrylic fibre-Acetate Manufacturing Division. He will be succeeded at Du Pont de Nemours (Nederland) by **Mr. William L. Scarborough**, who now holds the position to be filled by Mr. Geil.

● **Mr. A. Hofland**, director of the Royal Dutch Petroleum Co. and board member of the Royal Dutch/Shell Group, has been made a Knight of the Order of the Dutch Lion in the Dutch Queen's Birthday Honours List. Other honours include the granting of the title Officer of the

(Continued on page 782)



## Commercial News

### Burrell and Co.

Capital of the Cromford Colour Co. Ltd. is to be acquired by Burrell and Co. Ltd., producers of chemical colours, for £13,650 in cash and the issue of 900,000 Burrell 1s shares. Cromford produce a range of lead and zinc chromes and greens, which complements those already being made by Burrell and the Cornbrook Chemical Co. Ltd., acquired during the year by Burrell.

Net profit of Burrell and Co. for 1961 was £122,259 (£146,328) after tax of £123,513 (£120,223). A final dividend of 11½% makes 18% as forecast (same, but on smaller capital).

### Wm. Butler (Bristol)

Group trading profit of Wm. Butler and Co. (Bristol) Ltd. for 1961, after depreciation of £57,954 (£56,972) was £26,309 (£44,351). Tax took £16,449 (£16,847) and group profit after tax was £9,860 (£27,477). Net dividend, after tax, from Bristol and West Tar Distillers Ltd. was £36,176 (same). Parent company's net profit was £46,036 (£80,172). A final dividend of 7% makes 11% (same).

Subject to unforeseen circumstances, the directors consider that 1962 trading profits will be not less than £50,000, to which must be added £42,000 interest receivable. The directors have approved long term plans for development and expansion, involving the building and equipping of a new works.

### Edwards High Vacuum

Edwards High Vacuum Ltd. are being reorganised on the basis of an international holding company. The Canadian, U.S. and Italian associated companies will become wholly-owned subsidiaries, consideration for the acquisitions being shares in the holding company.

### A. B. Fleming

Group profit of A. B. Fleming (Holdings) Ltd., for the year ended 31 March were £689,268 (£761,074). After tax of £361,441 (£380,374) net profit was £327,827 (£380,700). A final dividend of 15% makes 20% (same).

### Hilger and Watts

The rights offer by Hilger and Watts of 1,084,516 5s Ordinary shares has been accepted to the extent of 1,076,402 shares.

### Greeff Chemicals

Greeff Chemicals Holdings are raising their dividend from 16½% to 20% with a final of 12½% for 1961. They propose a one-for-one scrip issue to those registered 8 May. Group profits were

- Burrell acquire Cromford Colour
- Wm. Butler plan building of new works
- Greeff Chemicals propose scrip issue
- U.S. Borax first quarter sales higher

£277,713 (£257,111). Net balance, after taxation and revenue reserves, was £142,750 (£123,440).

### Reckitt and Colman

Reckitt and Colman Holdings are maintaining their dividend at 12% with a final of 7% for 1961. It is proposed to subdivide £1 Ordinary into 10s shares. Group trading profit was £10,040,000 (£9,921,000) after absorbing exchange losses. Net balance was £4,866,000 (£5,083,000).

### Shell

The chairman of the Shell Transport and Trading Co. Ltd. told shareholders at the annual meeting on 3 May, that first-quarter 1962 profits of the Royal Dutch/Shell group were expected to be some £48 million—about 14% up on the first quarter of 1961. Final figures for the quarter are due on 11 May.

### Stanton and Staveley

From 1 June, the Stanton Ironworks Co. Ltd. will be known as Stanton and Staveley Ltd. Mr. R. F. A. Turner, director and general manager, and Mr. F. Corker, secretary of the subsidiary company, the Staveley Iron and Chemical Co. Ltd., will take on the additional duties from 1 June, of director and an assistant secretary, respectively, of Stanton and Staveley.

### Staveley Industries

Staveley Industries Ltd. are paying a second interim dividend for the 15 months to 30 September 1962, of 3%. Approximate rate of Group profits is unchanged.

### A.K.U.

Owing to higher costs, the directors of A.K.U., Arnhem, do not expect that 1962 net income will differ greatly from the 1961 result of Fl.32.3 million. An increase in sales of fully synthetic fibres and yarns is expected this year.

### Allied Chemical

Allied Chemical announce a regular quarterly dividend of 45 cents/share.

### Borg Warner

Earnings of Borg-Warner in the first quarter of 1962 amounted to 78 cents per share (40).

### American Cyanamid

First quarter sales and earnings of American Cyanamid were the highest for

any three month period. Sales were \$170,268,000 (\$148,183,000) and earnings 81 cents (57 cents) a share.

### Canadian Industries

Earnings for 1961 of Canadian Industries were 59 (74) cents a common share.

### Dominion Tar and Chemical

Dominion Tar and Chemical have declared a dividend of 20 cents on Common Stock payable on 1 August.

### Hercules Powder

Hercules Powder report first quarter 1962 earnings of 38 cents/share (30 cents). Net sales and operating revenues were \$104,999,453 (\$85,968,046).

### Kaiser Aluminum and Chemical

Kaiser Aluminium and Chemical Corporation report a first-quarter 1962 net profit of \$7.4 million or 41 cents a share (\$3,540,000, or 16 cents a share for the corresponding 1961 period). Sales rose over the period from \$6,280,000 to \$108,270,000.

### Lonza AG

Lonza AG, of Basle, are to pay a dividend of SF30/share for the nine-month financial period ended 31 December. The company had recorded a surplus of SF5,570,734 for the period, which is regarded as a financial year.

### Merck

First-quarter 1962 earnings of Merck and Co. amounted to 65 cents a share against 57 cents a share in the corresponding quarter of 1961.

### National Starch

Net sales of National Starch and Chemical Corporation in the three months ended 31 March amounted to \$17,798,853 (\$16,332,936 in the same period of 1961) giving earnings of 46 cents per common share (35 cents).

### Parke, Davis

Parke, Davis and Co., Detroit, recorded over the first quarter of 1962 sales of \$47.2 million (\$47,530,000) for the corresponding 1961 period. Net profit was also slightly lower at \$5,630,000 (\$5,750,000) or 38 (39) cents per share.

### Pittsburgh Plate Glass

The Pittsburgh Plate Glass Corp., the American glass and chemical combine, have taken over the majority shareholding in the French firm Corona, who

are among the leading French dye and varnish producers. In future, production methods of the American firm will be used in the company's plant at Valenciennes.

### Polymer

Polymer Corporation's 1961 annual report shows a record gross income of \$88,514,000. Net earnings after taxes were \$10,220,000 (\$9,850,000). The regular dividend of \$3 million, equivalent to \$1.50 a share, was paid. Rubber production from all units reached a new high of 361,000,000 lb. While the plants being built in France and Belgium are not yet in production, the effect of expenditures on these subsidiary operations is included in the consolidated report.

### Schering

Schering AG have announced a proposed 15% dividend for 1961 to be paid on Ordinary capital, which was increased last February to DM84 million. The dividend in 1960 was 15% on a capital of DM70 million.

### Thiokol Chemical

Thiokol Chemical Co., of the United States, report for the first quarter of the current year sales of \$60,470,000 and a net profit of 30 cents a share (\$41,950,000 and 22 cents).

### U.S. Borax

First quarter sales of United States Borax and Chemical, the U.S. operating company of Borax (Holdings) Ltd., totalled \$18,926,088 (\$17,181,730). Half year total to 31 March 1962 was \$34,954,368 (\$32,838,168). Gross profit for the quarter was \$7,798,391 (\$6,573,679) and for the six months \$14,429,228 (\$12,398,075). Net income for the quarter was \$2,165,982 (\$1,619,844), with the half year figure at \$3,788,200 (\$2,732,718). Quarterly earnings equalled 48 cents/share (34 cents) and the half year earnings were 83 cents (58 cents).

All areas of the company's business showed improvement, except potash which was hit by severe weather and by lower exports due to unusually large stocks held by overseas buyers.

### Union Carbide

Union Carbide Chemical announce a record turnover of \$405,600,000 for the first quarter of this year, 11 per cent above that for the corresponding 1961 period. Net profit over the period was \$37.7 million (\$33.7 million) or \$1.25 (\$1.12) per share.

### Zout-Ketjen

The holding company, Koninklijke Zout-Ketjen (formed by the merger of Ketjen and Royal Dutch Salt), has declared a 1961 dividend of 15% in cash, plus 5% in stock from the share premium reserve. For 1960 Nederlandsche Zoutindustrie paid 15% cash and 5% in stock and Ketjen paid 12% in cash.

### INCREASES IN CAPITAL

HOECHST PHARMACEUTICALS LTD., manufacturers of and dealers in drugs, etc., 11 Stoke Poges Lane, Slough. Increased by £30,000 beyond the registered capital of £20,000.

# PEOPLE IN THE NEWS (from p. 780)

Order of Orange-Nassau to **Mr. C. D. de Wolf**, board member of NV Koninklijke Zwanenberg-Organon (pharmaceuticals); **Mr. T. M. Bautz**, West European personnel manager of Unilever NV.; **Dr. J. P. F. Schröder**, general director of the Dutch-owned Spanish synthetic fibres concern La Seda de Barcelona S.A.; and **Mr. H. J. Ribbink**, of the chemical fibres marketing body NV Internationaal Rayon-Verkoopkantoor; while the knighthood of the Order of Orange-Nassau went to **Mr. J. Kornelis**, of the synthetic resins concern Kornelis Kunstharze Producten Industrie, and **Dr. C. van Meeuwen**, of the lacquers and paints manufacturing company Koninklijke Lak-, Vernis- en Verffabriek Molyne Co.

● At the annual general meeting of the Surface Activity Group of the Society of Chemical Industry, held on 30 April, the following officers were named to serve for the 1962-63 session: Chairman, **Sir Owen Wansbrough-Jones** (Albright and Wilson Ltd.); immediate past chairman, **Sir Eric Rideal**; hon. treasurer, **Mr. R. C. Tarring** (Shell Chemical Co. Ltd.); hon. recorder, **Mr. F. Riley** (Marchon Products Ltd.); hon. secretary, **Mr. M. K. Schwitzer** (Armour Hess Chemicals Ltd.).

● **Professor Vladimir Prelog**, Dean of The School of Chemistry, Swiss Federal Institute of Technology, Zurich, has been elected a foreign member of the Royal Society. Professor Prelog, is distinguished for his contributions to the development of modern stereochemistry.

● The Royal Society has appointed **Professor M. Szwarc**, research professor at the State University College of Forestry at Syracuse University, New

York, to be the Royal Society Visiting Professor for the academic year 1962-63. He is expected to take appointment on 1 August 1963 and to work in the department of inorganic and physical chemistry at the University of Liverpool on ionic and anionic and stereospecific polymerisation.

● **Mr. C. F. H. Cufley**, shipping advisor to International Minerals and Chemicals Ltd., London, has relinquished his appointment "in order to devote himself to a broader field of activity."

● **Mr. B. Hilton-Jones**, I.C.I. director in Zurich, is the new president of the British-Swiss Chamber of Commerce in Switzerland (formerly the British Chamber of Commerce for Switzerland).

● Two new members have been appointed to the board of management of the Arthur D. Little Research Institute, Inveresk Gate, Musselburgh. They are **Dr. S. S. Curran, F.R.S.**, who returns to Scotland from the U.K. Atomic Energy Authority to become director of the Royal College of Science and Technology, Glasgow, and **Professor Carrol L. Wilson, O.B.E.**, of the U.S. Atomic Energy Commission from 1947 to 1951 and who is now chairman of the O.E.C.D. committee on scientific research in Paris.

● **Mr. A. H. Sherriff**, for many years general sales manager of British Enka Ltd., now a subsidiary of Courtaulds Ltd., has joined the board of British Enkalon Ltd., associates of A.K.U., of Arnhem, who are constructing a nylon-6 plant in the U.K.

● **Mr. M. C. Hanna**, appointed a director of the Staveley Iron and Chemical Co. Ltd. in 1950, has resigned from the board and is to return to South Africa.

## Market Reports

### FAIR DEMAND FOR PEROXIDE, FORMALDEHYDE

**LONDON** Conditions show little change and industrial chemicals are mostly on a steady price basis. Routine soda products are moving in good quantities against contracts and a fair trade has been reported in formaldehyde and hydrogen peroxide.

Demand for fertilisers continues at a good level, while the export trade in this section has substantially improved in the first quarter of the year.

Conditions in the coal tar products market are unchanged with prices held steady.

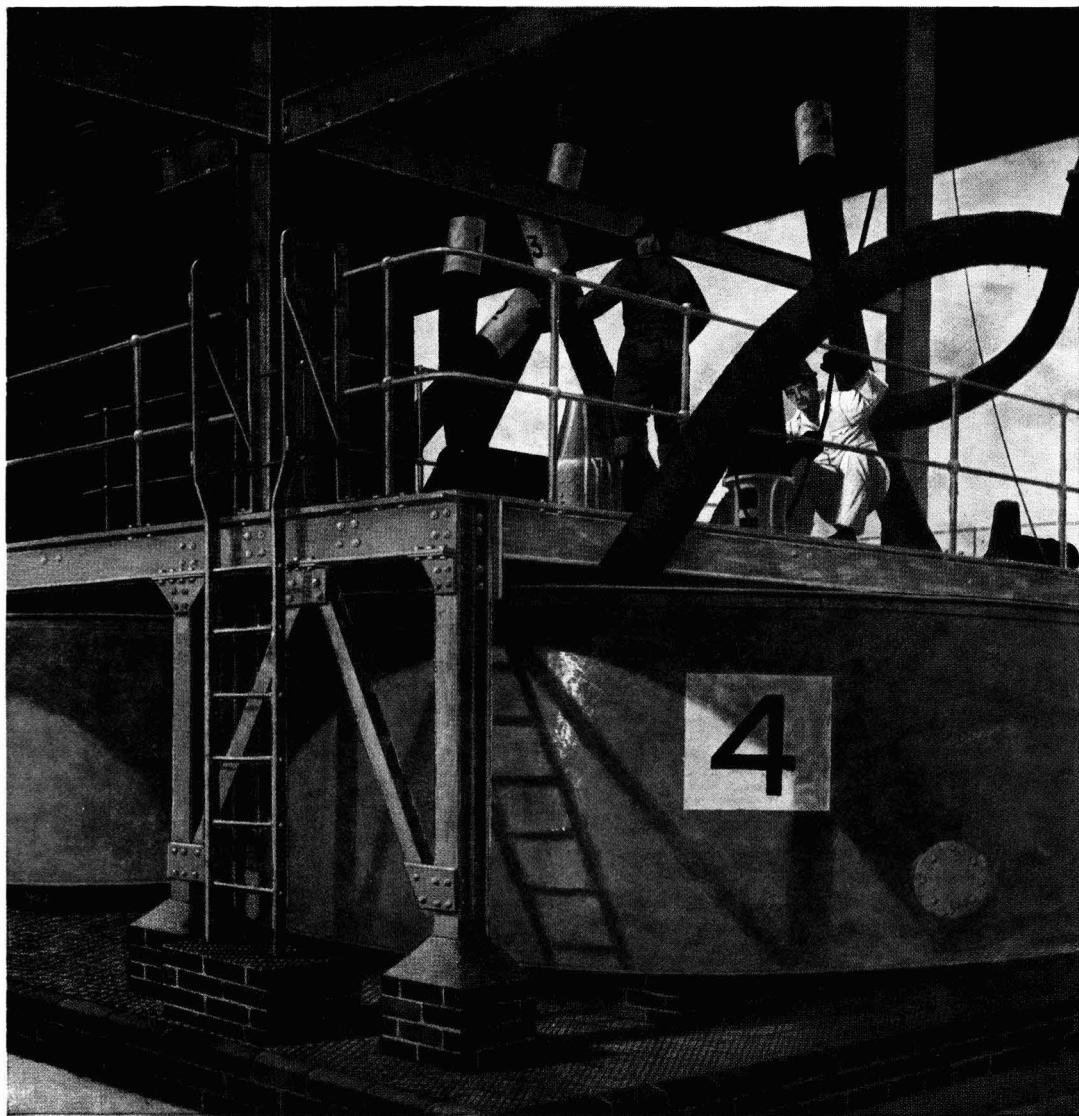
**MANCHESTER** New business in both light and heavy chemicals has been fair on both home and shipping accounts, the bulk comprising spot and near delivery bookings. Existing contracts with domestic consumers are being drawn

against reasonably well but there is room for improvement in the takings of bleaching and finishing materials by the cotton and allied industries.

Demand for refined tar, carbolic and cresylic acids and pyridines and also solvents is fair.

Chemical exports keep up reasonably well on the whole, although there are a number of relatively weak spots.

**SCOTLAND** Buying has been steady in most sections of industry and overall during the past week a fairly brisk position has prevailed. Apart from the usual range of heavy chemicals, demands have been varied, with quantities well maintained. Prices on the whole have remained steady. The position in regard to exports has been satisfactory with a good volume of enquiries.

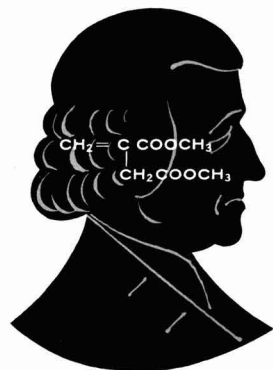


### Where 'WHITER-THAN-WHITE' begins

Keen is the word for the market in detergent chemicals. Keen and competitive. But Marchon has every intention of retaining its leading place among detergent chemical manufacturers. For instance, a new phosphoric acid plant has just been completed at Whitehaven. It is part of Marchon's current expansion scheme, all of which is designed to improve the quality, economy and service for which Marchon has become a symbol all over the world.

**Marchon**

# Pfamous Pfizer monomers



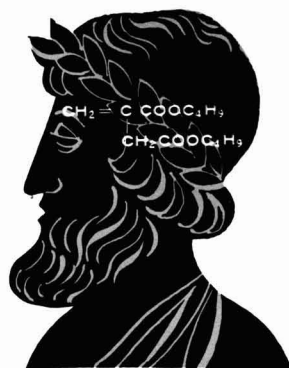
DIMETHYL ITACONATE

- co-monomer for giving improved hardness, flexural strength, tensile strength, impact strength, oil resistance and ultra violet stability.



ITACONIC ACID

- economical co-monomer for introduction of carboxyl groups into polymer chains. Gives extra reactive carboxyl group, for adhesion, emulsion stability, alkali solubility, oil resistance.



DIETHYL ITACONATE

- co-monomer for internal plasticisation, also giving improved ultra violet stability and oil resistance.

Other esters available in sample quantities. For further details enquire:

Pfizer Ltd., Chemical Sales Division, Sandwich, Kent.  
Sandwich 2371, Advance (London) 1234 (inter-connected).

## A.C.S. National Meeting

# Molecular sieves can catalyse polymerisation reactions

THE ability of molecular sieves to polymerise olefins is an unexpected activity discovered by Dr. J. C. J. Norton of Ohio Oil Co. and reported to the petroleum chemistry section of the 141st National Meeting of the American Chemical Society.

It was found that certain molecular sieves dehydrated at low temperatures acquire strong acid sites. Batch and continuous reactions were carried out in laboratory autoclaves and continuous flow reactors using Types A and X molecular sieves made by Linde. Most reactions occurred between 200° to 550°C with pressures ranging from 200 to 1,100 p.s.i.g.

Catalytic activity varies with sieve size, acidity and composition. In propylene polymerisation, there appears to be an inverse correlation between the polymerisation constants and reactive alumina content of the sieves.

Generally molecular sieves polymerise isobutylene more easily than propylene,

and propylene more easily than ethylene. Larger and more acid sieves have greater reactivity, although the correlation is not completely consistent. Selective catalysis of small molecules may be possible with sieves based on pore size limits.

In addition to polymerisation reactions, molecular sieves cause other acid-catalysed reactions. They isomerise and crack olefins and dehydrate alcohols, but the acid sites are not strong enough to alkylate benzene with propylene, for example, nor to isomerise and crack paraffins.

There are disadvantages in using sieves for olefin polymerisation. They are not as vigorous catalysts as conventional solid acids prepared by treating solid supports with mineral acids. Too little is known about the selective sieve acid-catalysed reactions, and little is known about the sieve's useful life as catalysts, their susceptibility to poisons, and how they can be regenerated.

## New hydrocracking catalyst comes from work aimed at improving petroleum products

RESEARCH directed at improved petroleum products and lowering refining costs has led to the development of a new catalyst and new data on the performance of other catalysts used for the hydrocracking of petroleum fractions.

The new hydrocracking catalyst has been developed by chemical engineers at Esso Research Laboratories, Baton Rouge. Details of its composition were not disclosed beyond that it contains a small percentage of noble metal on a new type of support. The new catalyst has good activity and good maintenance of activity in the presence of nitrogen compounds.

The Esso catalyst has operated well under continuous service. During the equivalent of four months' operating time, a negligible amount of activity was lost under conditions of a constant feed containing 40 p.p.m. of nitrogen. If the same feed were hydrocracked with a conventional catalyst such as nickel sulphide or silica alumina under the same pressure, the catalyst's useful life would be one or two weeks. If the nitrogen content of the feedstock is low the new catalyst will operate at a lower pressure of around 800 p.s.i. compared with 1,500 p.s.i. This is lower than that tolerated by conventional catalysts.

Additional data information on performance of presently available catalysts has been obtained by workers of

the Socony Mobil Oil Research Department, Paulsboro, N.J. In general, they found that platinum catalysts, when processing straight run gas oils, give more valuable products initially, but are less stable to regeneration than cobalt-molybdena catalysts. Thus if regenerations are likely to be frequent, the latter catalysts would be better. Nickel-tungsten sulphides are intermediate in initial product value and in regeneration stability.

Renewed interest in hydrocracking has been influenced by a number of factors: availability of low cost hydrogen as by-product of catalytic reforming; availability of more active catalysts which permit lower operating pressures for hydrocracking, thus lowering equipment costs; and efforts to increase feedstocks for catalytic cracking for upgrading some refinery streams such as catalytic cycle stocks and coker gas oils.

### National safety conference in London in 1963

A national industrial safety conference is to be held in London for the first time, and chemicals will be among the trade groups to which special sections will be devoted. Organised by the British Safety Council for personnel and safety officers, the conference is planned to tie in with an exhibition on the same theme. Both will take place at the Central Hall on 28-31 January 1963.

## American Oil's work on process models in research and development

ONE of the approaches made by American Oil in searching for new techniques to shorten process development time and to reduce the high costs of collecting empirical data, is the process model. The company has used the process model to develop an optimised process for the isomerisation of pentanes and hexanes and has found that it minimises the need for pilot plant experiments. The development of such a process is particularly difficult in the petroleum industry where feedstocks and reaction kinetics are so complex.

A process model, based on a few controlling reactions, was developed to study reaction kinetics directly. The model interprets experimental results mathematically, and reveals interactions and effects of variables such as space velocity. It makes the extrapolation and interpolation of data and scale up more reliable, and the process model also defines catalyst activity.

Isomerisation is especially suitable to the approach through the process model since the important reactions are relatively few and have been thoroughly studied. Process models, however, are useful for more involved processes. Even though the reactions are more numerous and more complicated, the major factors which determine product quality and yield are probably controlled by only a few critical reactions.

## Industrial potential of photochemistry

PHOTOCHEMISTRY is gaining potential as an industrial tool. It has long been known as a powerful and selective technique, but it has a number of major characteristics which have limited its widespread application. Development work has been aimed at getting round the disadvantages or at making use of them. In the case of the Toyo Rayon caprolactam plant (see CHEMICAL AGE 19 August, 1961, p. 263) the use of a photochemical technique in the process has been made economically practical because of the development of high-powered mercury arc lamps, which can be used practically in large numbers.

Work at Stanford Research Institute, Menlo Park, Calif., has shown that focusing light to a point in fluids moving in a quartz tube yields better performance than direct illumination. The concept of treating process streams with ultraviolet radiation from radio-isotope phosphor pebble beds has been made more attractive by advances in nuclear waste technology. In addition, processes in which a 1- to 5-mil penetration of UV in plastics and rubbers is a help, have been successfully developed and licensed by Quantum, Inc.

### Will

Mr. Robert Craig, 1 Brookhurst Cottage, Allport Road, Bromborough, Ches, consulting chemical engineer, who died on 29 November, left £14,008 net.

# NEW PATENTS

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

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

## AMENDED SPECIFICATION

On sale 7 June

Substituted phenothiazinyl piperazines. Morren, H. 861 420

## ACCEPTANCES

Open to public inspection 14 June

Polymeric materials. Bexford Ltd. 898 775

Making of synthetic resin-impregnated fibrous laminated articles. National Research Development Corporation. 898 776

Process for oxidising olefins to aldehydes, ketones and acids. Farbwerke Hoechst AG. 898 790

Thermoplastic compositions for the production of phonograph records and method of preparing records. Montecatini. [Addition to 810 023.] 898 672

Condensation products of the anthraquinone series and process for their manufacture. Farbwerke Hoechst AG. 898 535

Monoazo dyestuffs and their metal complex compounds. Sandoz Ltd. 898 529

Polyether-urethane rubber. General Tire & Rubber Co. 898 530

Production of carboxyphenyl derivatives of pentavalent phosphorus. Mid-Century Corporation. [Addition to 807 091.] 898 943

Azo dyes derived from dihydroxyphenyl ketones and their use in photography. International Polaroid Corporation. 898 706

Chromomycin A components of the antibiotic chromomycin. Takeda Pharmaceutical Industries Ltd. 898 793

3-diacetamido-2,4,6-triiodobenzoic acid and derivatives thereof. May & Baker Ltd. 898 780

Process for the manufacture of terephthalic acid and isophthalic acid. Chemische Werke Buna Veb. 898 557

Method for preparation of grafted copolymers. Polyplastic. 898 709

Process for the production of polyolefins. Ruhrchemie AG. 898 559

Sulphonation of hydrocarbon oils. Sonneborn Chemical & Refining Corporation. 898 796

Vitamin B<sub>12</sub> halides and process for the preparation thereof. Shionogi Seiyaku Kabushiki Kaisha 898 685

Sulphonamides. Merck & Co. Inc. 898 782

Process for the manufacture of aliphatically or cyclo-aliphatically substituted 1,2,4-trithiolanes. Leuna-Werke Walter Ulbricht Veb. 898 574

Process for the continuous production of chlorine dioxide. Farbwerke Hoechst AG. 898 865

Preparation of members of the tetracycline series. American Cyanamid Co. 898 784

Manufacture of filamentary material from copolymers of acrylonitrile and vinylidene chloride. Courtaulds Ltd. 898 734

Compositions comprising plant growth regulants. Shell Research Ltd. 898 915

Ketones and polymers thereof. British Nylon Spinners Ltd. 898 866

Process for the manufacture of propionitrile. Leuna-Werke W. Ulbricht Veb. 898 736

Process for the catalytic polymerisation of  $\alpha$ -olefins, particularly ethylene. Leuna-Werke W. Ulbricht, Veb. 898 650

Green anthraquinone dyestuffs and their use. Geigy AG, J. R. 898 881

Synthesis of 3,4-lutidine. Distillers Co Ltd. 898 869

Antibiotic BA-163, preparation thereof and compounds of and compositions containing said antibiotic. Pfizer & Co. Inc., Chas. 898 936

Polyphenyleneboronous acid. Associated Electrical Industries Ltd., Davidson, J. M. and French, C. M. 898 740

Manufacture of metallic compositions. General Electric Co. Ltd. 898 497

Ketals of methylenedioxypropionophenone. Norda Essential Oil & Chemical Co. Inc. 898 581

Polymers containing polyamide-acid recurring units and their production. Du Pont de Nemours & Co., E. I. 898 651

Continuous carbonisation process and apparatus. Cabot Corporation. 898 800

Process for the production of compound polymers of polycarolein. Deutsche Gold-und Silber-Scheideanstalt. 898 743

Hydrazine derivatives. Smith & Nephew Ltd., T. J. 898 879

Polymerisation of butadiene-1,3 and catalysts thereof. Polymer Corporation Ltd. 898 627

Method for the manufacture of mixed phosphorothioate esters. Dow Chemical Co. 898 755

Herbicidal compositions. Shell Research Ltd. 898 916

Preparation of organic sulphites. Imperial Chemical Industries Ltd. 898 630

Preparation of catalyst for polymerisation of 1-olefins. Hercules Powder Co. 898 631

Polymers containing reactive aminomethylene groups. Farbenfabriken Bayer AG. 898 967

Process for the production of sulphur. Universal Oil Products Co. 898 474

Isocyanates or isothiocyanate reactions. Union Carbide Corporation. 898 724

2,5-Dihydro-1,2-benzothiadiazepine 1,1-dioxide. Lepetit Spa. 898 850

Production of amides. Distillers Co. Ltd. 898 757

Chemotherapeutic compositions for controlling plant rusts. Spencer Chemical Co. 898 951

Ferrocene derivatives. Imperial Chemical Industries Ltd. [Addition to 819 108.] 898 633

Polymeric quaternary phosphorus compounds and method of preparing same. American Cyanamid Co. 898 759

Preparation of catalysts. British Petroleum Co. Ltd., White, P. T. and Winsor, J. 898 972

Hypocholesterolaemic compositions. Imperial Chemical Industries Ltd. 898 596

Pharmaceutical antiviral compositions comprising isatin- $\beta$ -thiosemicarbazone. Wellcome Foundation Ltd. 898 855

Production of ethylene homopolymers and copolymers. Phillips Petroleum Co. 898 476

Process for the production of xanthocillin. Arzneimittelwerk Dresden Veb. 898 498

3-Perfluoroalkyl-1,2,4-benzothiadiazine-1,1-dioxide derivatives. Smith Kline & French Laboratories. 898 853

Aqueous dispersions of self-cross-linking copolymers. Farbenfabriken Bayer AG. 898 968

Preparation of filamentary structures from synthetic nitrogen-containing polymers. Du Pont de Nemours & Co. Ltd., E. I. 898 889

$\beta$ , $\beta$ -pentamethylene butyrolactone. Warner-Lambert Pharmaceutical Co. [Addition to 897 931.] 898 692

Process for the production of homopolymers or copolymers from acrylonitrile. Farbenfabriken Bayer AG. 898 821

Method of producing diboron tetrachloride. United States Borax & Chemical Corporation. 898 891

Steroids. Upjohn Co. 898 585

Therapeutic compositions comprising 1-(1,2-diphenylethyl)pyrrolidine and salts thereof. Upjohn Co. 898 663

Naphthalene compounds and process for their manufacture. Ciba Ltd. 898 909

Phosphorothioic esters and process for obtaining them. Montecatini. 898 910

Method of manufacturing Cis-1,4-polybutadiene. Bridgestone Tire Kabushiki Kaisha. 898 834

Stabilisation of halogenated hydrocarbons. Columbia-Southern Chemical Corporation. 898 586

Separation of phenols and organic bases from a mixture thereof with hydrocarbons. Rütgerswerke AG. 898 519

Manufacture of polyolefins. Shell Internationale Research Maatschappij NV. 898 838

Production of asymmetrical dialkyl hydrazines. Farbenfabriken Bayer AG. 898 667

Antibulphuric compositions comprising substituted ethylene diamines. American Cyanamid Co. 898 928

Octahydroindole derivatives. Boehringer & Söhne GmbH, CF. 898 590

Covulcanisation of polymers of ethylene and propylene with unsaturated copolymers containing isobutylene. Polymer Corporation Ltd. 898 670

Olefin polymers. Aziende Colori Nazionali Affini Acna SpA. 898 695

Salts of penicillins. Rhone-Poulenc. 898 863

Method of purifying olefin polymers. Montecatini. 898 929, 898 930

Dihydroxyphenylketonic compounds and their use in photography. International Polaroid Corporation. [Divided out of 898 706.] 898 707

## DIARY DATES

### MONDAY 14 MAY

Lab. apparatus and mats. exhib.—Harrogate: Exhibition and Royal Halls. 10 a.m.  
 Soc. Inst. Tech.—Manchester: Lit. and Phil. Soc., 36 George St., 6.45 p.m. A.g.m. and 'Aids to marine navigation' by J.W. Nicholls.

### TUESDAY 15 MAY

Inst. of Ind. Safety Officers.—Manchester: 36 George St., 6.30 p.m. 'Laboratory safety' by Holden.

S.C.I.—London: 14 Belgrave Sq., S.W.1, 6 p.m. A.g.m. and 'The significance of cation exchange equilibria in soil' by Dr. P. W. Arnold.

S.C.I.—Liverpool: Gossage Theatre, The Univ., Vine St., 6.15 p.m. A.g.m. and 'Industrial research with special reference to the oil and fat industry' by P. N. Williams.

### WEDNESDAY 16 MAY

R.I.C.—Wellwyn Garden City: Mid-Herts Coll. of Further Ed., 7.30 p.m. 'Colour' by C. J. Chamberlin.

S.C.I.—London. Visit to Warren Spring Lab. Soc. Inst. Tech.—Blackpool, A.g.m.

### THURSDAY 17 MAY

R.S.—London, Burlington Hse., Piccadilly, W.1, 4.30 p.m. Croonian lecture on insulin and its action by F. G. Young.

S.C.I.—Dublin: Arthur Guinness and Son, St. James Gate, 9.30 a.m. Symposium—'The applications of gas chromatography to food analysis'.

Soc. Inst. Tech.—Newcastle: Conf. Room, Roadway Hse., Oxford St., 7 p.m. A.g.m. and film show.

### FRIDAY 18 MAY

C.S.—Dublin: Dept. of Chem., Trinity Coll., 7.45 p.m. 'Recent developments in acetylene-allene chemistry' by Prof. E. R. H. Jones.

S.A.C.—Llandudno: Imperial Hotel. Summer mtg. of North of England Section.

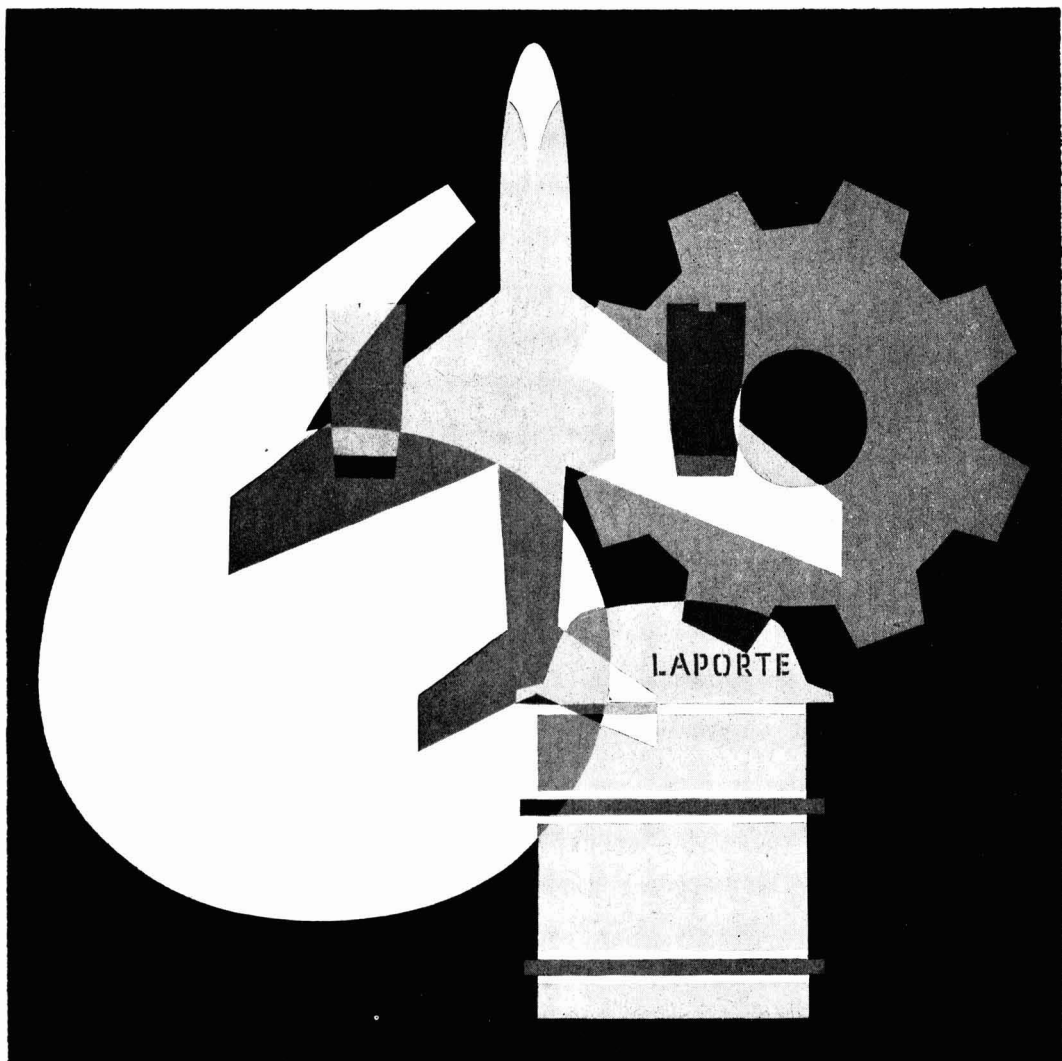
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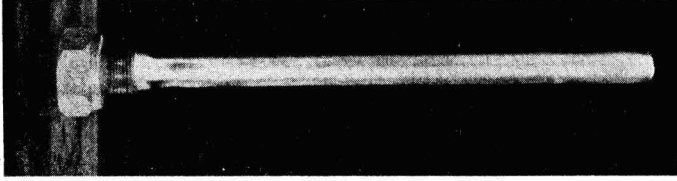


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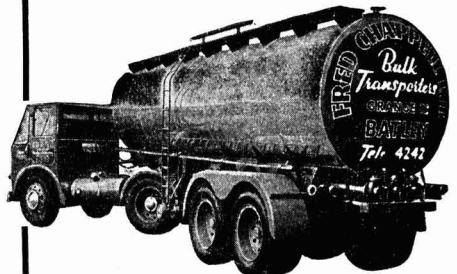
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# TRADE NOTES

## Chromatogram preservative

A new chemical, for the preservation of thin layer chromatograms for documentation and other purposes is now being produced by Merck, of Darmstadt, W. Germany. Under the trade name Neaton, it is being handled on their behalf in the U.K. by Anderman and Co. Ltd., Battlebridge House, 87-95 Tooley Street, London, S.E.1, from whom full information can be obtained.

## Reactive dye

The second 'cold-dyeing' homogeneous green to be added to I.C.I. reactive dyes, Procion olive green 3G, has tinctorial and building-up properties that should find wide application in the dyeing of cotton and viscose rayon fabrics, both as a self-shade and as a shading component for other Procions. Samples and full details will be supplied by I.C.I. Dyestuffs Division, Blackley, Manchester 9.

## Changes of address

As from 1 June, the sale of Armeens, Armacs, Arneels, Arquads, Duomeens, Duomacs, Etho-chemicals, Armohibs, Armoflos, etc., will be transferred to the Armour-Hess central sales office which already handles sales of Distec fatty acids and other products. The address is: Armour Hess Chemicals Ltd., Brotherton Chambers, Grace Street, Leeds 1 (phone:

Leeds 35041). The London area office will remain at: 6 Arlington Street, St. James's, London S.W.1.

Sulzer Bros. (London) Ltd. moved on 7 May to new and larger premises at Bainbridge House, Bainbridge Street, London W.C.1, where the entire London staff are now accommodated under one roof. Telephone number is still Museum 7890.

## Instruments showrooms

The new twin-storeyed building housing the expanded Manchester sales and service organisation of the Cambridge Instrument Co., and its associate, Electronic Instruments Ltd., is now in full operation at Lord Street, Manchester 3 (phone Deansgate 5391/2). It has a floor area of 2,600 sq. ft.

## B.D.H. catalogue

Additions of laboratory chemicals to the catalogue of British Drug Houses Ltd., Poole, are: 2-amino-thiazole, N-benzyl-dimethylamine, calcium fluoride (selected natural fluorite), polyvinyl-pyrrolidone, and uranyl acetate and nitrate both of natural isotopic composition.

## Bakelite resins

An advance information sheet P.20 on their resin DSR-19184, a gel coat system based on a high quality general

purpose polyester resin, and designed for application with spray gun methods, is available from Bakelite Ltd., 12-18 Grosvenor Gardens, London S.W.1. Another advance sheet P.22 deals with their DSR-19188 product, a polyester resin based, premixed, gel coat system.

## Escher Wyss (U.K.)

As from 6 April Escher Wyss (U.K.) Ltd., Terminal House, 52 Grosvenor Gardens, London S.W.1, took over the representation of Escher Wyss Ltd., Zurich, and their affiliated companies; hitherto handled by their London technical office for the past 50 years. Mr. Max Wiesendanger, who was in charge of the office, is general manager of the new set-up.

## Southern Analytical

Second exhibition of instruments for chemical analysis will be held by Southern Analytical Ltd. at the Hotel Russell, Southampton Row, London, from 28 May to 1 June (10 a.m. to 5.30 p.m.).

## Industrial flooring

Formula R.B.731 epoxy resin flooring, now available from Rowan and Boden Ltd., special products division, Paisley, Renfrewshire, offers advantages to industrial chemical and engineering concerns because of its ability to withstand heavily laden steel-wheeled trolleys and all types of industrial traffic. It is stated to give a tough abrasion resistant floor with a jointless non-skid surface.

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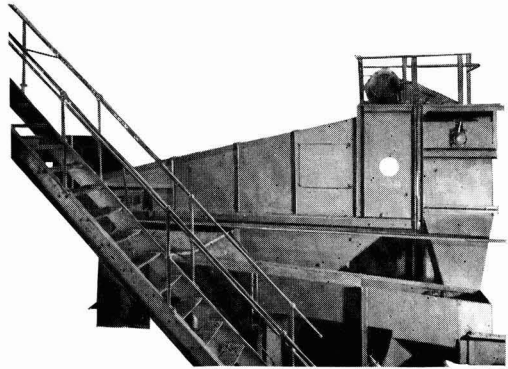
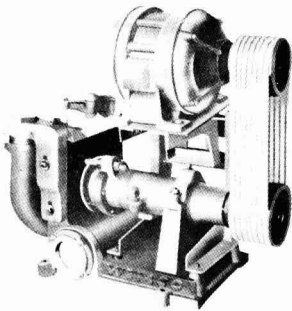
3rd FOLD

CUT ALONG THIS DOTTED LINE

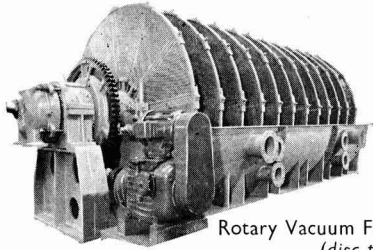
# PLANT FOR

ACID NEUTRALIZATION · CONTINUOUS & BATCH  
CAUSTICIZING · SEPARATION OF SOLIDS FROM LIQUIDS  
WATER FILTRATION · WATER CLARIFICATION

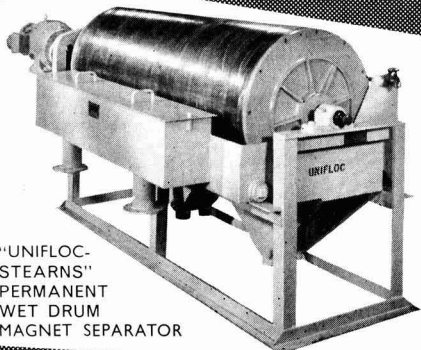
"WEMCO"  
SAND &  
SLURRY  
PUMP  
IN  
"N.I." HARD"



D.M.5 Dense Media Separator



Rotary Vacuum Filter  
(disc type)

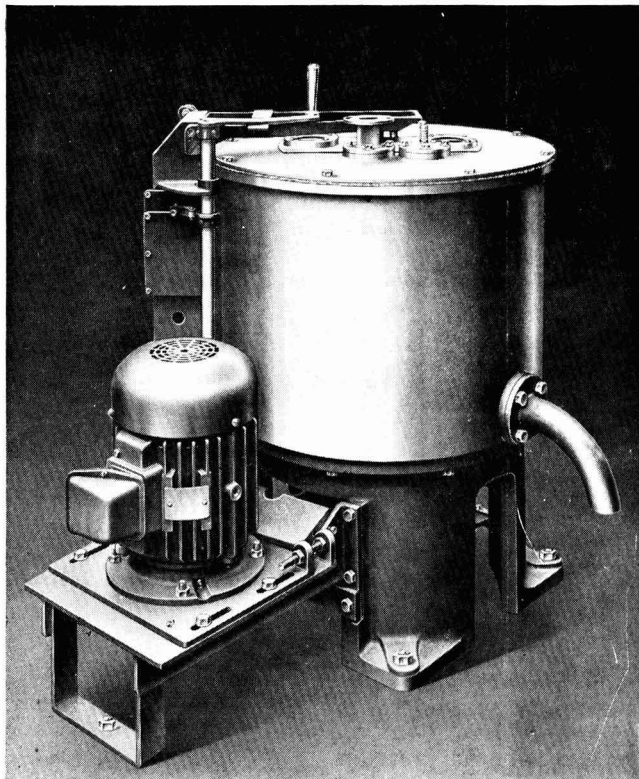


"UNIFLOC-  
STEARNS"  
PERMANENT  
WET DRUM  
MAGNET SEPARATOR

*Equipment includes:*

- AGITATORS & MIXERS · CAUSTICIZERS
- CLARIFIERS · CONDITIONERS · CONVEYORS
- CENTRIFUGAL SAND PUMPS · DIAPHRAGM PUMPS (PRESSURE TYPE) · ELEVATORS
- FROTH FLOTATION CELLS · ROTARY VACUUM FILTERS · PADDLE MIXERS
- SLUDGE PUMPS · THICKENERS · STRING DISCHARGE FILTERS · VIBRATING SCREENS
- MAGNETIC SEPARATORS





**Now available  
with variable  
speed drive!**

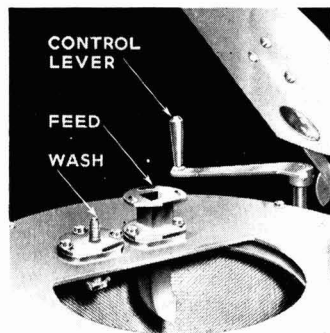


This modern centrifuge is soundly designed, constructed, and suitable for research departments, pilot plant testing or general purpose small batch processing. Because of improved production methods we are able to offer—QUICK DELIVERY.

## **21" TYPE 86 STAINLESS STEEL CENTRIFUGE for laboratory or small batch processing**

### **SIMPLE SAFE CONTROL**

Lever control is fully interlocked with the control panel, by means of a flameproof switch. The adjustable stainless steel feed pipe and washing rose are standard fittings.



# **BROADBENT**

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