

Chemical Age

incorporating

PETROCHEMICALS and POLYMERS

24 February 1962. Vol. 87. No. 2224

WORMALD RESIGNS
FROM FISON'S
BOARD (P. 310)
D.C.L. ARE FIRST
WITH ABS (P. 311)
TITANIUM OXIDE
MARKET (P. 317)

THE WEEKLY NEWSPAPER OF THE CHEMICAL INDUSTRY



CRYSTAL CLEAR

Boron phosphate crystals

—that boron phosphate has a future in optical and in many phosphate glasses. In specially prepared forms it also has applications in fluid and fixed bed catalysis. Two good reasons for using boron phosphate.

Boron phosphate—another  **20 MULE TEAM** product

BORAX CONSOLIDATED LIMITED BORAX HOUSE CARLISLE PLACE LONDON SW1 TELEPHONE VICTORIA 9070

TGA BX219

Write for your copy of this **NEW**
PLATINUM LABORATORY EQUIPMENT
CATALOGUE



The range of standard platinum laboratory equipment offered by Engelhard Industries has recently been enlarged, and this new catalogue has been prepared in order to provide a comprehensive guide to all the items now available.

For the convenience of users the catalogue also details those vessels and implements which are normally available from stock.

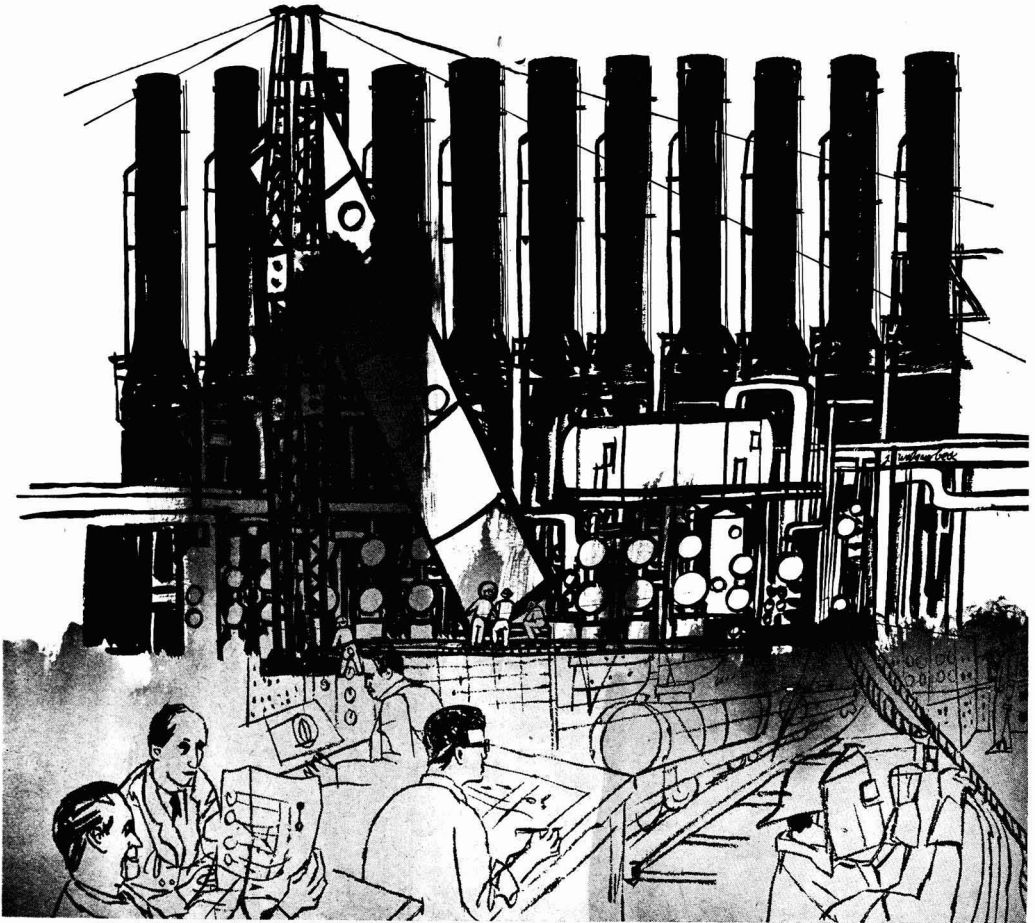
Copies of the catalogue are available free of charge to those engaged in analytical chemistry.



ENGELHARD
 INDUSTRIES, LTD
 BAKER PLATINUM DIVISION

52 HIGH HOLBORN · LONDON · W.C.1 · CHAncery 9050 (20 lines)
 -5.6331.2505

■ Kellogg Engineering Teamwork at Work



CHEMICAL PLANTS FROM SCRATCH

For many of the world's leading chemical and petrochemical firms, the Kellogg method of executing a capital investment in new plants and plant expansions has proved the soundest way to minimise expenditure.

This economic route to new chemical plants consists of co-ordinating and controlling all phases of engineering, procurement, and construction under an internationally integrated management. It is founded on close teamwork among all Kellogg operations at home and abroad... and with client engineering staffs.

Kellogg's method has improved process and plant engineering... saved money in procuring materials

and equipment... increased labour productivity... expedited erection... achieved the earliest possible on-stream dates... and stayed within pre-determined costs. The result is the plant which achieves the optimum balance of investment and operating costs.

Working with clients on this basis, Kellogg has been responsible for a variety of chemical plants throughout the world.

If you are planning to build new processing facilities at home or abroad, Kellogg would be glad to show you how its engineering teamwork could work to your company's advantage. Please address inquiries to



Kellogg International Corporation

KELLOGG HOUSE · 7-10 CHANDOS STREET · CAVENDISH SQUARE · LONDON W.1

SOCIETE KELLOGG · PARIS · THE CANADIAN KELLOGG COMPANY LTD · TORONTO
KELLOGG PAN AMERICAN CORPORATION · BUENOS AIRES · COMPANHIA KELLOGG
BRASILEIRA · RIO DE JANEIRO · COMPANIA KELLOGG DE VENEZUELA · CARACAS

Subsidiaries and affiliates of **THE M. W. KELLOGG COMPANY NEW YORK**

**RESINS
IN
AQUEOUS DISPERSIONS**

AFCOLAC A Polyvinyl acetates

including :

- AFCOLAC A 21** homopolymer
very stable toward pigments
used in plasticized cements
- AFCOLAC A 50** internally plasticized copolymer
excellent weathering properties

AFCOLAC B Styrene-Butadiene copolymers

including :

- AFCOLAC 101 S** improved light stability
antifoaming
- AFCOLAC B 111** for paper clay coating

AFCOLAC C Vinylidene chloride copolymers

- AFCOLAC C 151** for paper coating
- AFCOLAC C 161** impermeable to greases and vapors
- AFCOLAC C 161 is anti-autoblocking

These two products fulfil the French foodstuff regulations

**UNSATURED
POLYESTER RESINS**

STRATYL A 113 for wood coating
medium viscosity

STRATYL A 119 low viscosity

ORGANIC CHEMICALS

PHTHALIC ANHYDRIDE
MALEIC ANHYDRIDE
MALEIC ACID
FUMARIC ACID
CHLORINATED PARAFFINS

INORGANIC CHEMICALS

LEVILITE (precipitated silica)
ZEOLEX (white pigments)
Precipitated barium sulphate
Aluminium hydrate, levigated, precipitated
Zinc sulphate
Sodium silicates, solid, soluble



**PRODUITS CHIMIQUES
PECHINEY-SAINTE-GOBAIN**

16 AVENUE MATHIGNON PARIS 8^e

SOLE CONCESSIONNAIRE FOR UNITED KINGDOM :

K. W. CHEMICALS Ltd • Caroline House • 55/57 High Holborn • LONDON W. C. 1

O.C.C.A. : Stand 12

INDEX TO ADVERTISERS

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

Page	Page	Page	Page	Page	Page
188	Jamesales Ltd.	---	National Industrial Fuel Efficiency Service	---	Sharples Centrifuges Ltd.
---	Jenkins, Robert, & Co. Ltd.	---	137 Neckar Water Softener Co. Ltd.	---	3 Sheepbridge Equipment Ltd.
---	Jobling, James A., & Co. Ltd.	---	165 Negretti & Zambra Ltd.	---	Shell Chemical Co. Ltd.
---	Johnson, Matthey & Co. Ltd.	---	---	---	Shell-Mex & B.P. Co. Ltd.
144	Johnsons of Hendon Ltd.	---	Back Cover	---	Shell Industrial Oils
---	Jones & Stevens Ltd.	---	Newton Chambers & Co. Ltd.	---	Shirley, Aldred, & Co. Ltd.
---	---	---	Nordac Ltd.	---	Siebe, Gorman & Co. Ltd.
202	K.D.G. Instruments Ltd.	---	Normalair Ltd.	---	Sigmund Pumps Ltd.
---	K. & K. Laboratories Ltd.	---	204 Northgate Traders (City) Ltd.	---	173 Silvercrown Limited
---	K. W. Chemicals Ltd.	303	Nuovo Pignone	---	Simon-Carves Ltd.
---	Kaylene (Chemicals) Ltd.	---	178 Odoni, Alfred A., & Co. Ltd.	---	52 Simon, Richard, & Sons Ltd.
158	Kellie, Robert, & Sons Ltd.	---	Oil & Colour Chemists' Association Ltd.	---	Simon Products Ltd.
---	Kellogg International Corporation	301	Optical-Mechanical (Instruments) Ltd.	---	Smith, Leonard (Engineers) Ltd.
196	Kenton Fluorescent Mfg. Co.	---	Orthos (Engineering) Ltd.	---	Sojuzhimexport
---	Kernick & Son Ltd.	---	Orford Paper Sack Co. Ltd.	---	311 Southern Analytical Ltd.
138	Kestner Evaporator & Engineering Co. Ltd.	---	P.G. Engineering Ltd.	---	Spence, Peter, & Sons Ltd.
---	Kestner Evaporator & Engineering Co. Ltd. (Keebush)	---	Palfrey, William, Ltd.	---	199 Spencer Chapman & Messel Ltd.
---	---	---	Pechiney-Saint-Gobain	303	Spencers Joinery Ltd.
163	Klinger, Richard, Ltd.	---	Peebles, Bruce & Co. Ltd.	---	156 Standard Chemical Co.
---	Laboratory Apparatus & Glass Blowing Co.	---	Penrhyn Quarries Ltd.	---	358 Stanton Instruments Ltd.
---	Laboratory & Electrical Engineering Co.	---	233 Permutit Co. Ltd., The	---	198 Steel Drums Ltd.
---	Laboratory Glassblowers Co.	---	G/Card Petrocarbon Developments Ltd., The	---	208 Steel, J. M., & Co. Ltd.
---	Langley Alloys Ltd.	---	Petroderivatives Ltd.	---	184 Sturge, John & E., Ltd.
183	Lankro Chemicals Ltd.	---	Pfizer Ltd. (Chemical Division)	---	Sturtevant Engineering Co. Ltd.
---	Laporte Chemicals Ltd.	---	Phillips, Dr. M. A., & Associates	---	Super Oil Seals & Gaskets Ltd.
---	Laporte Industries Ltd.	---	---	---	Surface Protection Ltd.
---	Laporte Titanium Ltd.	---	216 Pickfords Limited	---	Sussex & Dorking United Brick Co. Ltd.
150	Leek Chemicals Ltd.	---	Pickstone, R. & E., Ltd.	---	208 Synthite Ltd.
---	Leigh & Sons Metal Works Ltd.	340	Pitman, Sir Isaac, & Sons Ltd.	---	291 Taylor Rustless Fittings Co. Ltd.
---	Lennig, Charles & Co. (Great Britain) Ltd.	---	Plastic Coatings Limited	---	202 Thermal Syndicate Ltd., The
---	Lennox Foundry Co. Ltd.	156	Plastic Filters Ltd.	---	Tidy, S. M. (Haulage) Ltd.
215	Light, L., & Co. Ltd.	---	214 Platon, G. A., Ltd.	---	172 Titanium Metal & Alloys Ltd.
---	Lind, Peter, & Co. Ltd.	---	Podmore, W., & Sons Ltd.	---	Todd Bros. (St. Helens & Widnes) Ltd.
---	Lloyd & Ross Ltd.	---	Podmores (Engineers) Ltd.	---	Towers, J. W., & Co. Ltd.
141	Lock, A. M., & Co. Ltd.	---	Polypenco Ltd.	---	279 Tylores of London Ltd.
---	Longman Green & Co. Ltd.	---	Polysius Ltd.	---	Uhde, Friedrich, GmbH
---	Longworth Scientific Instruments Co.	204	Pool, J. & F., Ltd.	---	196 Unicono Co. Ltd., The
204	Lord, John L., & Son	---	Pott, Cassels & Williamson Ltd.	---	155 Unifloc Ltd.
175	Loughborough Glass Co. Ltd.	---	Potter, F. W., & Soar Ltd.	---	189 Union Carbide Ltd.
---	Low & Bonar Ltd.	---	275 Powell Duffryn Carbon Products Ltd.	---	United Coke & Chemicals Co. Ltd.
---	Lummas & Co.	---	G/Card Power-Gas Corporation	---	200 United Filter & Engineering Co. Ltd., The
---	Lurgi Verwaltung GmbH.	330	192 Price Stutfield & Co. Ltd.	---	194 United Wire Works Ltd., The
---	Luwa (U.K.) Ltd.	---	Prodorite Ltd.	---	G/Card Universal-Matthey Products Ltd.
210	McCarthy, T. W., & Sons	---	Price's (Bromborough) Ltd.	333	184 Volerepe Ltd.
---	McMurray, F. J.	---	Purkiss, Williams, Ltd.	---	178 W.E.X. Traders Ltd.
---	MacLellan, George, & Co. Ltd.	Back Cover	Pye, W. G., & Co. Ltd.	---	205 Walker, P. M., & Co. (Halifax) Ltd.
---	Maine, B. Newton, Ltd.	---	Pyrene Co. Ltd.	---	Wallace & Tiernan
150	Manesty Machines Ltd.	---	Pyrene-Panoram Ltd.	---	8 Waller, George, & Son Ltd.
145	Marchon Products Ltd.	329	Q.V.F. Ltd.	---	Ward, Thomas W., Ltd.
---	May & Baker Ltd.	---	Quickfit & Quartz Ltd.	---	Warren-Morrison Ltd.
---	Mechans Ltd.	---	170 Reade, M. G.	---	164 Watson, Laidlow, & Co. Ltd.
---	Front Cover	---	Reavell & Co. Ltd.	---	Watson-Marlow Air Pump Co.
---	Metal Formations Limited	---	Recontainers Limited	---	Wellington Tube Works Ltd.
---	G/Card Metalock (Britain) Ltd.	---	Rheem Lysaght Ltd.	---	Welwyn Tool Co. Ltd.
192	Metcalf & Co.	---	Rhodes, B., & Son Ltd.	---	259 Whitaker, B., & Sons Ltd.
---	Metering Pumps Ltd.	---	Richardson Scale Co. Ltd.	---	257 Wilcox, W. H., & Co. Ltd.
146	Middleton & Co. Ltd.	---	Richmond Welding Co. Ltd.	302	Wilkinson Rubber Linatex Ltd.
---	Mineralite Import und, Export GmbH.	---	Robinson, James, & Co. Ltd.	---	Wilkinson, James, & Son Ltd.
---	Mirrlees Watson Co. Ltd., The	---	Rosin Engineering Co. Ltd.	---	212 Williams & James (Engineers) Ltd.
194	Mirvale Chemical Co. Ltd., The	---	278 Rotameter Manufacturing Co. Ltd.	---	Witco Chemical Co. Ltd.
---	Mitchell, L. A., Ltd.	---	Ryaland Pumps Ltd.	---	212 Wood, Harold, & Sons Ltd.
---	Mond Nickel Co. Ltd., The	338	S.P.E. Company Ltd.	200	Worcester Royal Porcelain Co. Ltd., The
---	Monkton Motors Ltd.	---	Sandiacre Screw Co. Ltd., The	---	Wynn (Valves) Ltd.
---	Mono Pumps Ltd.	---	Saunders Valve Co. Ltd.	357	Yorkshire Engineering & Welding Co. (Bradford) Ltd.
---	Monsanto Chemicals Ltd.	---	Scientific Design Co. Inc.	---	206 Yorkshire Tar Distillers Ltd.
198	Moritz Chemical Engineering Co. Ltd.	---	Scientific Glass Blowing Co.	---	172 Young, A. S., & Co.
---	Morris & Ingram Ltd.	---	Scott Bader & Co. Ltd.	---	152 Zeal, G. H., Ltd.
206	Nailsea Engineering Co. Ltd.	---	190 Scottish Tar Distillers Ltd.	---	
---	National Coal Board	---		---	

FOR ZINC SULPHATE PURE

CONSULT

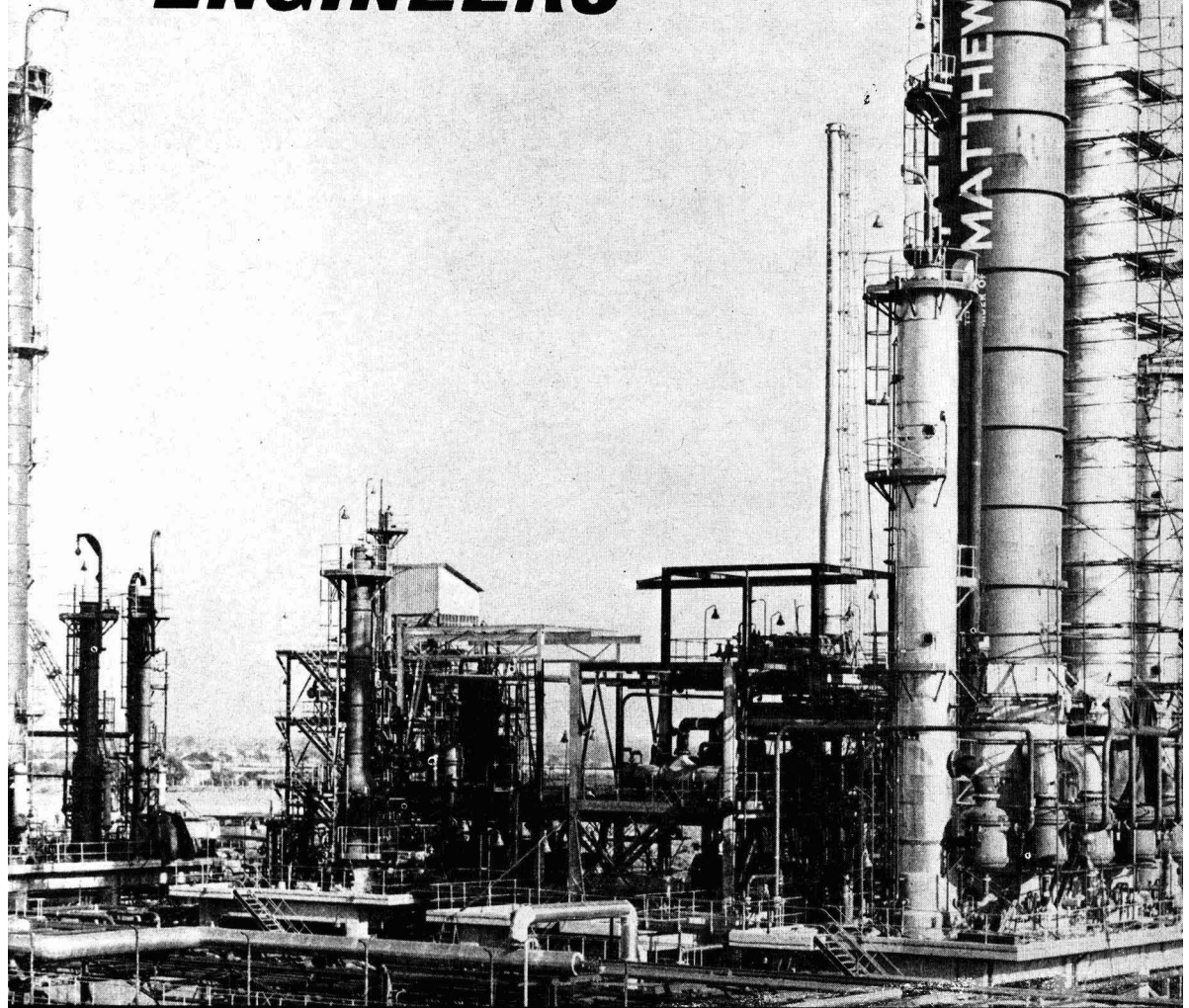
FREDERICK ALLEN & SONS (POPLAR) LTD.

PHOENIX CHEMICAL WORKS, UPPER NORTH STREET, LONDON, E.14.

Telephone: EAST 2673 (5 lines)

Cables: NITRIC, POP LONDON

**PETROLEUM
& CHEMICAL
ENGINEERS**



MATTHEW HALL

& CO. LTD.

WHITE AND P.H. NEUTRAL SUPERVENTILATED

A.R.B.

A.R.

RAW DRIED

NATURAL SUPERVENTILATED



TRADE MARK

TISSOLIT 88 AND 88 B

ULTRAGEL 100

CLARBENTON

BENTAL

*A range of HIGH QUALITY BENTONITES at economical prices
with special grades to suit various industries*

For use in:

Foundries, Animal Feeds, Drilling, Paper, Soap, Rubber and Allied Industries.
Plastics, Linoleum, Grinding and abrasives, Waterproofing, Insecticides, Explosives, Textiles, Pharmaceutical products,
Cosmetics, Paints, Enamels, Ceramics and Refractory materials, Clarification of Oils, Animal or Vegetable Fats, Wines, Beers,
Water Purification.

From the largest and best **BENTONITE** deposits in Italy with certain characteristics similar to American Bentonites

Produced by:—

Technical literature and samples upon request from sole concessionaires in U.K. and other European countries:

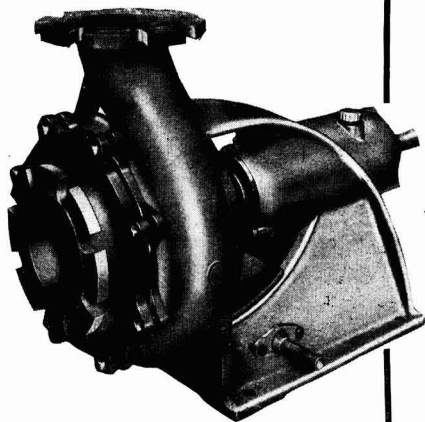
CHEMICALS AND FEEDS LIMITED

ADELAIDE HOUSE · KING WILLIAM STREET · LONDON E.C.4

Telephone: Mansion House 9621 (5 lines) Cables: "Chemifeed" London Telex 23209

Associated with: P. Leiner & Sons (Wales) Ltd., The Glamorgan Alkali & Acid Co. Ltd. and other U.K. and Overseas manufacturers

NEW!



MANUFACTURED BY

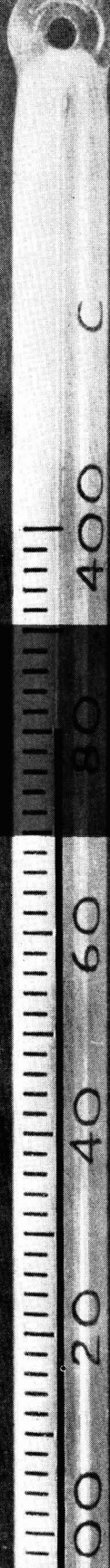
**DEUTSCHE STEINZEUG—UND
— KUNSTSTOFFWARENFABRIK
MANNHEIM—FRIEDRICHSFELD**

*A Chemical Pump which
combines greater efficiency
with maximum versatility*

- Simplified and streamlined construction.
- Interchangeable heads and impellers—of stoneware, stainless steel, cast silicon, titanium, etc.
- With gland or mechanical seal.
- With closed or open impeller.
- From 5-2,000 g.p.m., and 5-150 ft. W.G.

For further information
and literature apply to:

Sole Agents: **ANDERMAN & COMPANY LIMITED**
Battlebridge House, 87/95 TOOLEY STREET, LONDON, S.E.1.
HOP: 0035/36, 1169



STRIKING SUCCESS

I.C.I. CATALYST 33-2 BOOSTS SULPHURIC ACID PRODUCTION



Striking temperature 380°C! Sulphuric acid production up 15-20% and no additional SO₂ escape to atmosphere! All this can be achieved with I.C.I. Catalyst 33-2. Because of its activity in the lower temperature range, I.C.I. Catalyst 33-2 gives a high level of conversion so that increased production does not mean increased escape of SO₂ in the exit gas. Why not find out for yourself how this catalyst can boost output in your plant? One of I.C.I.'s computers at Billingham has been programmed to calculate the performance of I.C.I. Catalyst 33-2 under a wide range of conditions; send us basic information and we will carry out this service for you.

**IMPERIAL CHEMICAL INDUSTRIES LIMITED,
MILLBANK, LONDON, S.W.1.**

CARLESS

*Hydrocarbon
Solvents and
Diluents*

SPECIAL NAPHTHAS

- Specific gravity 0.860—0.865
- Distillation range 145°C—180°C
- Flash point minimum 87°F
- Specifications varied to meet requirements of individual customers

Let us send you a sample and a quotation

CARLESS, CAPEL & LEONARD, LTD.

° HACKNEY WICK, LONDON, E.9 Amherst 5500

FIRST FIND THE RIGHT PEOPLE

A leading technical college chose TRF, the Stainless Steel specialists, to build this Fermentor. Why TRF?

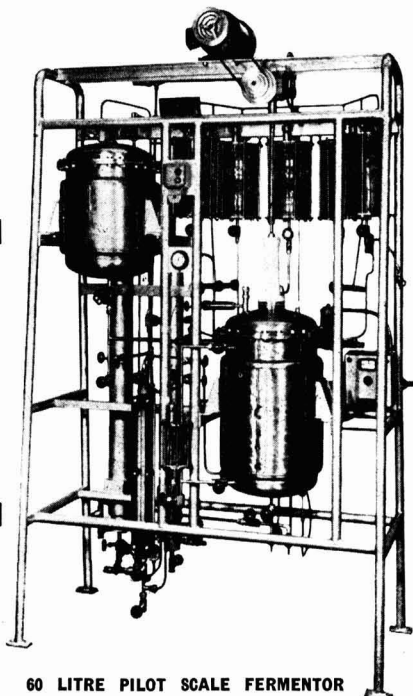
Because, very sensibly, they preferred to deal with the specialists . . . the people with the right solution to Stainless Steel problems.

Stainless Steel could be playing a major part in *your* new plant. Much better speak to the right people about it . . . TRF.

TAYLOR RUSTLESS FITTINGS CO LTD



HEAD OFFICE: RING ROAD, LOWER WORTLEY, LEEDS
Tel: LEEDS 638711
LONDON OFFICE: 14 GREAT PETER ST. LONDON, W.1
Tel: Abbey 1575



**60 LITRE PILOT SCALE FERMENTOR
WITH MEDIUM PREPARATION VESSEL
AND GLASS ADDITIONAL VESSELS.**

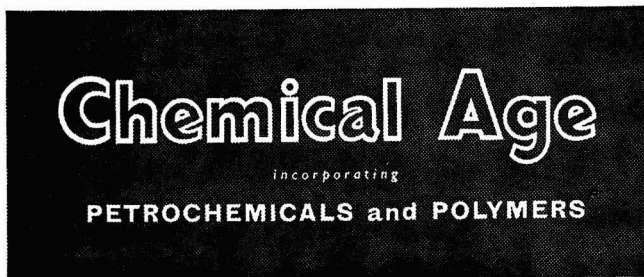
VOL. 87

No. 2224

FEBRUARY 24 1962

Telephone: Fleet Street 3212 (26 lines)

Telegrams: Benformula - London E.C.4



ONE OF THE BENN GROUP

Chairman

Glanvill Benn

Director of 'Chemical Age'

N. B. Livingstone Wallace, D.S.C.

Editor

M. C. Hyde

Manager

R. C. Bennett

Assistant Editor

C. E. Davis

Technical Editor

Shirley Mann

Pesticides & Fertilisers

V. A. J. Wakely

Editor, Commercial Grower

Leather Chemicals

Edwin Haydon

Editor, Leather Trades Review

Gas By-products

J. L. Eades

Editor, Gas World

Fire Prevention

C. R. Elliott

Editor, Fire Protection Review

Electrical & Electronics

Norman H. Codling, D.F.H., M.I.E.E.

Editor, Electrical Journal

Europe & Common Market

Phillip J. Halls

Editor, British Trade Journal & Export
World

Printing Inks & Dyes

D. G. Muggleton

Editor, Sales & Wants Advertiser

Annual subscription is: home, 57s 6d,
overseas, 65s, single copies 1s 9d (by
post 2s)

BOUVERIE HOUSE · 154 FLEET STREET · LONDON · EC4

MERGER POLEMICS

THAT I.C.I.'s bid for Courtaulds would assume the proportions of an undignified struggle was inevitable. Once I.C.I. had made their offer, over the heads of Courtauld's board, they could have expected little else.

This is the price the bidder must pay in such circumstances. No matter how strong the merits of the case, a bid as large as I.C.I.'s will always arouse political antagonism and a hostile Press, together with misreporting and misrepresentation. Sympathy will always be with the company that is the subject of the bid, regardless of past performance, present status or future prospects.

It is clearly in I.C.I.'s interests to avoid a slanging match and their pamphlet, 'Man-made fibres, the I.C.I. view,' wisely acknowledged Courtaulds' excellent record in many fields and rested the company's case mainly on the issue of vertical integration.

In view of this document and all the information published before and since the merger talks became known, it is surprising that the most serious misrepresentations of I.C.I.'s case should have been made in *The Times*. *The Times* was, of course, perfectly within its rights as an independent newspaper to be critical of I.C.I.'s bid in its leading article of 14 February. It was, however, regrettable that a newspaper of such high repute should be so ill-disposed to I.C.I. as to present as objective comment what amounted to misleading statements and inaccuracies. These were answered the next day by a letter from I.C.I.'s chairman, who quoted published information, all of which must have been freely available to *The Times*.

But 'The Thunderer' was not through with I.C.I. and on Tuesday this week returned to the attack. It still insisted on comparing I.C.I.'s growth record unfavourably with that of the big three German chemical producers, quoting figures to show that I.C.I.'s growth of sales, exports and research spending fell far behind what had been achieved in Germany.

All this is widely known. *The Times* rejects Mr. Chambers' view that the German industry could expand faster because it was still recovering from the war, by saying 'surely by 1956 the post-war recovery phase was over.' It is true that the German chemical industry has by now completely recovered from its war-time devastation, but in the years since the war it has operated in an economy that has seen almost continual boom conditions. On the other hand, I.C.I. have had to operate through alternate periods of peaks and depressions; 1961 saw a major recession throughout the British economy. In those circumstances, neither I.C.I. nor any other chemical company could be expected to match the German growth rate.

Despite what *The Times* said this week, Mr. Chambers' basis of comparison is far more valid. He compared the growth rates of the chemical industries of Britain and Germany with the growth rates of all manufacturing industry in the two countries. This showed that in less favourable trading conditions, I.C.I. expanded at three times the rate of British industry, while German chemicals could only expand at double the rate of all German industry.

(Continued on page 325)

Differences with chairman led Fisons' managing director to resign

A matter of method rather than policy

RESIGNATION of Mr. Avison Wormald, a joint managing director of Fisons Ltd., is not due to the letters that he wrote to *The Times* on 25 January and 16 February or to *The Guardian* on 9 February, all of which appeared after his resignation was tendered on 15 January. Mr. Wormald has himself since confirmed that these letters had no connection with his resignation.

Mr. Wormald has now stated that his request to "resign immediately", which



Mr. A. Wormald

he tendered on 15 January, was motivated by serious and prolonged differences with the chairman. At no time had there been a dispute with the board. For several weeks, endeavours were made to persuade Mr. Wormald to reconsider his decision.

The board of Fisons was informed of Mr. Wormald's letter of 15 January at the meeting on 19 February. It was then stated that the chairman's recommendation that his resignation should be accepted was not concerned either with his letters on the I.C.I.-Courtaulds bid, or with a letter received by Sir Clavering Fison from Mr. S. P. Chambers, I.C.I.'s chairman, on Saturday, 17 February, requesting that Fisons should dissociate themselves publicly from Mr. Wormald's views on the takeover bid.

Mr. Wormald commented: "I came to Fisons in 1950 when the fortunes of the group were at a very low ebb. In the last 10 years, my colleague, Mr. Napier (joint managing director of Fisons), and myself have created an efficient and modern business organisation on the most advanced lines. Recent reorganisation which I have had carried out have ensured excellent management in all the constituent companies of the group. I have no doubt that the group is well equipped for a successful future."

The view is held in chemical industry circles that Mr. Wormald's differences with the chairman came to a head over the decision to abandon the ammonia project which was jointly planned with Esso at Milford Haven.

In a statement issued on Monday, the directors of Fisons declared that at their meeting on 19 February, the board "resolved to accept forthwith" his resi-

gnation as a managing director and director. Sir Clavering Fison stated on Monday that the letters expressed Mr. Wormald's views and were not authorised by the Fisons' board.

Before becoming Fisons' commercial director in 1950, Mr. Wormald was commercial manager of British Nylon Spinners Ltd., the company jointly owned by I.C.I. and Courtaulds. He has also been managing director of the Chemical Division of Fisons. He was appointed a managing director early in 1960 when the parent company was reorganised into a holding company.

Pending the appointment of a successor, Sir John Carmichael, who joined the Fisons board on 15 March 1961, will assume the responsibilities assisted by a management committee. Sir John, who is 51, was Under-Secretary to the

Courtauld's new fibre is copolymer of vinylidene chloride and acrylonitrile

COURTAULDS' new synthetic fibre, BHS, is a copolymer with equal weight proportions of vinylidene chloride and acrylonitrile, together with small but critical quantities of other substances. The copolymer as prepared is soluble in acetone and the continuous filament fibre is spun on machines similar to those used for Dical and Tricel fibres.

This was stated at an exhibition of the new fibre held on Wednesday. After spinning, the fibre receives certain finishing treatments and is thereafter insoluble in acetone and other common inorganic solvents. It is said to have exceptional resistance to the action of those solvents and to damage by acids and alkalis. Fast dyeing is effected by simple techniques.

Excellent flame resistance is claimed and this is said to be effective even after

Sudan Ministry of Finance and Economics from 1954.

In March 1960 he was appointed chairman of Fisons Pest Control's Sudan subsidiary and later in that year became a director of Fisons Pest Control Ltd.

No boardroom row says Sir Clavering

The whole of the board of Fisons were in full accord with the chairman's recommendation that Mr. Wormald's resignation should be accepted. This was stated by the board on Wednesday; their statement added that it might appear from a reading of Mr. Wormald's personal statement that the directors did not support the chairman; this wasn't so.

"The differences between the chairman and the managing director were personal differences and were in no way connected with either major matters of company policy or long term company developments. These personal differences between the chairman and Mr. Wormald were related to method rather than policy."

Sir Clavering Fison said: "There was certainly no boardroom row."

repeated washing or dry cleaning.

The new fibre now in pilot plant production at Coventry will go into full-scale production as soon as the present merger situation is resolved. A wide range of textile uses is claimed for BHS, which is named after the three scientists who created it in Courtaulds' own research laboratories.

I.C.I. annual results published on Thursday

I.C.I.'s annual results were published on Thursday this week, after CHEMICAL AGE had gone to press. They include in greater detail the results announced by Mr. S. P. Chambers earlier this month and reported in C.A. 17 February, p. 283.

I.C.I. and Courtaulds approve leak report

THERE was no evidence that any premature information regarding negotiations between I.C.I. and Courtaulds was made known to the Press, state William Charles Crocker, the London firm of solicitors engaged by the two companies to investigate the 'leak' of information prior to I.C.I.'s statement on 18 December. Both boards have now approved the report, which was published on Thursday. Commander L. J. Burt, former head of the Scotland Yard Special Branch was engaged to carry out the investigations.

It was found that the article in the *Daily Mail* of 18 December merely gave expression to rumours that had existed among well-informed journalists in the

City, not as a result of a leak of information from either company, but because to some people familiar with the problems of both companies, such a merger appeared at that time in the words of the financial editor of *The Guardian* as "a sound and logical industrial proposition".

The hoax telephone calls on Sunday, 17 December, made by an unknown caller to four newspapers and Independent Television News gave no information regarding the negotiations, but merely referred to I.C.I. and the Common Market.

It was also found that both companies took all reasonable and appropriate steps to prevent any premature disclosure of information regarding negotiations.

DISTILLERS ARE THE FIRST U.K. PRODUCERS OF ABS COPOLYMERS

Result of D.C.L.—British Xylonite merger

DISTILLERS are the first British company off the mark in the ABS copolymer field. It was announced on Tuesday evening by Mr. H. H. Woolveridge, a director of the Distillers Company, that Abstrene M, an acrylonitrile/butadiene/styrene copolymer, is now being made by Distillers Plastics Group.

Initial capacity of the plant is 1,000 tons/year, but it is expected that this will later rise to several thousand tons a year. For the time being, D.C.L. are concentrating on the U.K. market, where consumption is currently estimated at around 2,000 tons/year.

Various parts of the Distillers organisation are involved in the project. The polymer is being made by the Distillers Plastics Group at Barry, Glam., while the compounding is being carried out by BX Plastics at Manningtree, Essex. British Resin Products and BX Plastics are responsible jointly for marketing.

The ABS project is one of the fruits of the merger of Distillers and British Xylonite, which took place exactly a year ago. Distillers were closely connected with British Xylonite before the merger and it was in 1939 that they acquired a 50% interest with them in BX Plastics. Since the merger there has been even closer co-operation between the two companies at all levels, resulting now in the development of ABS.

Grangemouth project

Speculation was rife towards the end of last year as to who would be the first British manufacturer of ABS copolymers. It was widely thought that one of the larger companies—I.C.I., Distillers, Monsanto or Shell—would lead the way, but it was a joint venture of Anchor Chemical and the Marbon Chemical Division of Borg Warner that was the first to be announced (see CHEMICAL AGE, 14 October 1961, p. 584). Anchor are not yet saying when the plant—scheduled for production at Grangemouth—can be expected on stream, neither have they revealed the capacity, beyond saying that it will be smaller than that operated by Marbon in West Virginia, where capacity is currently 25 million lb. a year.

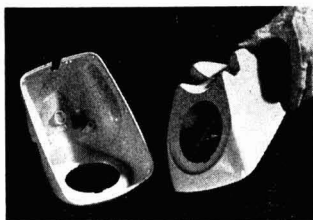
Distillers are well placed for two of the raw materials. British Hydrocarbon Chemicals, a joint Distillers/B.P. company, make butadiene, and Forth Chemicals (B.H.C., and Monsanto) produce styrene. Although D.C.L. have developed an ammoxidation process for the manufacture of acrylonitrile, it is understood that they do not at present intend to build a plant based on it. They are importing supplies for their ABS operation.

D.C.L. plant investment for ABS is

estimated at around £100,000 or £1,000 per 100 tons of products.

Abstrene M is a material in its own right, not a blend. Distillers describe it as holding an important place among the 'alloys' which are extending the scope of plastics still further in industry.

Distillers have called their ABS copolymer Abstrene M to denote that the



Telephone handsets show advantages of ABS in intricate mouldings which have excellent surface finish in a wide range of colours

material is specifically designed for injection moulding purposes. In many applications it will overlap existing plastics such as toughened polystyrene, polypropylene, acetate resin and some acrylics, but its main contribution to the development of plastics applications will be in breaking new ground, as industries become familiar with the material.

Abstrene M is a light-weight material with a specific gravity of 1.03, but with a tensile strength between 5,500 and 6,500 lb./sq. in. and an Izod impact strength of 3.5 to 4.5 ft. lb./in. It offers a resistance to impact over a wide range of temperatures; it is still significantly tough at -20°C . Softening point is $93-95^{\circ}\text{C}$.

A particularly valuable feature is its resistance to salts, mineral acids, most alkalis and organic alcohols, and glycerine, glycol and aliphatic hydrocarbons. Ageing characteristics are good although prolonged exposure to strong sunlight or any ultra-violet source is not recommended.

Abstrene M is recommended for many applications. The ease with which it moulds and reproduces intricate detail makes it suitable for covers and cases of all types; resistance to a wide range of chemicals makes it suitable for use in industrial plant; and its good electrical properties coupled with its light weight will give it outlets for radio cabinets, particularly for transistor portables. It will also be of interest in the packaging field.

The price of Abstrene M varies from 3s 8½d/lb. in bulk to 4s 3d/lb. (depend-

ing on size of delivery) for natural colour, and between 3s 10½d and 4s 7d for standard colours. The colour range will be built up gradually as needs are met. The product is packed in free, non-returnable 50 lb. valve-type polyethylened multiwall sacks. "Absolute minimum" for new colour matchings is 1,200 lb.

Although tonnage-wise ABS does not rank among the world's leading plastics materials, as experience in the use and processing of the material grows, and as new processes are introduced, Distillers expect that British industry will use Abstrene in increasing quantities in the future.

ABS has been made for several years in the U.S. but was only introduced into the U.K. recently. Main British suppliers are Anchor Chemical, I.C.I. and Monsanto. It is also manufactured in Germany and Italy.

Total U.S. output of ABS in 1961 has been estimated at 50 million lb., 40 million lb. below capacity level. Output in the U.S. is expected to rise 90 million lb. by 1965 and to top 200 million lb. by 1970.

Shell plan full-scale production of sulfolane

DEVELOPMENT quantities of sulfolane (tetramethylene sulphone) are being offered by Shell Chemical Co. Ltd. and commercial quantities will be available shortly from an existing plant at Stanlow, near Chester. Sulfolane has been known for many years but has never before been produced on a fully commercial scale.

Sulfolane is a highly polar compound with outstanding solvent properties and high chemical and thermal stability. It is miscible with water and can be used as a solvent for a wide variety of organic compounds. Melting at a little over room temperature, it is thermally stable up to temperatures above 200°C and has a high flash point. These properties combine to make sulfolane of interest as a chemical reaction medium, as an extraction solvent and in other applications.

Shell have patents covering extraction or extractive distillation with sulfolane type solvents and will shortly be ready to discuss the licensing situation with potential users of sulfolane.

Project news

For details of other new U.K. chemical industry projects, including Shorko Packaging's new Swindon plant for oriented polypropylene film, see page 316.



★ Big talking point of the week—apart from the more controversial issues of I.C.I., Courtaulds and Fisons—is undoubtedly the march stolen by the Distillers Plastics Group in the field of ABS copolymers. Anchor Chemical in conjunction with Marbon of the U.S., were first to announce their intention of producing ABS in the U.K., but to D.C.L. goes the honour of being first in production.

This is one of the visible benefits of the merger a year ago of the British Xylonite Group with Distillers. Being first in production in a relatively small volume material (U.K. consumption is currently around 2,000 tons/year) is a great advantage, particularly since Distillers are already looking ahead to an output of several thousand tons a year.

When Anchor/Marbon named Grange-mouth as the site for their plant, it was widely assumed that they would take butadiene and styrene from the nearby facilities of D.C.L. associated companies. I can disclose that this is not the case; since D.C.L. have now embarked on their own ABS production, it seems that their future competitors will have to look elsewhere for supplies.

★ I AM now able to clear up a mystery that has puzzled a number of readers of this journal. In their statement to M.P.s, Courtaulds discussed total production of man-made fibres in the U.K. and Europe and then gave the following breakdown as between fibres: viscose rayon, 20%; acetate and triacetate, 40%; acrylics, 20%; and nylon, 26%.

This was generally taken to mean the part played by each of these fibres as a percentage of total fibre output, and it was pointed out the figures added up to 106%!

However, I now learn that the breakdown refers to Courtaulds' share of the European production of various fibres.

★ THE decision to abandon the Fisons-Esso ammonia project must have been tough to make. While I am sceptical of claims that natural-gas produced ammonia will outdate all other processes, I would not like to risk a £12 million project on that ground alone.

I would, perhaps, have been more inclined to worry about existing ammonia capacity and the already-announced plans for expansion. I.C.I.'s capacity is nearer 525,000 tons a year than the 325,000 tons mentioned in our leading article last week. Their new Severnside plant will add 100,000 tons to that next year; in addition Shell Chemical have just over 80,000 tons

capacity at Shellhaven. In addition to U.K. nitrogen fertiliser consumption—worth some 450,000 tons in 1960/61—must be added around 150,000 tons a year for industrial usage.

Even if the natural gas route to synthesis ammonia is not quite as cheap as has been claimed, it could still have an edge on existing oil-based routes. It would obviously be an advantage if British chemical producers had access to bulk supplies of natural gas; the logical development is to connect this country by under-channel pipeline to the Continent.

★ IN the case of projects that have been abandoned before the start of construction, even though the promoters may lose little in the way of investment, there always is a 'loser'. In the case of this project it is the seven or eight plant contractors who submitted bids for the new plant.

Since the cost of putting in detailed bids for large chemical plants runs into several thousands of pounds sterling, the loss is not a small one. The contractor, who gets no compensation, feels he has a case for genuine complaint.

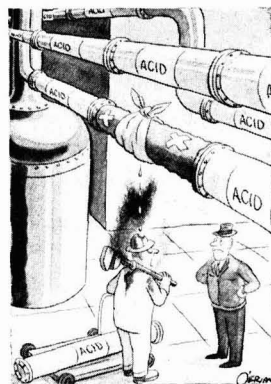
It is difficult to know what can be done in such circumstances unless special provision is made. In the absence of a signed contract, the chemical company would doubtless be loth to compensate all the contractors concerned.

★ I HAVE referred before to the pressing need for a greater flow of published statistics relating to the chemical industry. To some extent the hands of Government Departments are tied, either by virtue of companies refusing to release their own statistics, or by reason of economies imposed by the Treasury.

I was glad, therefore, to see that Sir Miles Thomas, chairman of Monsanto Chemicals, is calling for a Bureau of National Statistics to provide the Government and industry with a comprehensive flow of information on which to base economic policies and forward planning. Writing in *The Financial Times*, Sir Miles says Britain's poor record for the availability of adequate statistics is "causing the O.E.E.C. member nations to regard us with not a little disfavour". He says, quite rightly, that the need for accurate estimation of markets and for intelligent planning of new production capacity makes the provision of adequate statistics about U.K. production, consumption, imports and exports of vital importance to Government and industry alike.

After dealing with the Government's

lack of enterprise and co-ordination in dealing with statistics, Sir Miles points out that there is a school of thought in industry itself which believes that everything that is revealed will be seized on by domestic and overseas competitors and used to the disadvantage of the firm concerned. He makes the point that, if this were the case, British industry, on the basis of its unwillingness to publish information about itself, should be trouncing its competition in most of the world's major markets.



"Now where did you say this last section of Teflon-lined pipe was to go?"—By courtesy of E.I. du Pont de Nemours and Co.

★ A 15% SAVING on a ship's fuel bill turned out to be a useful 'by-product' of extensive trials carried out to find an improved form of protecting the ship's hull. I.C.I. General Chemicals Division, who make Alloprene chlorinated rubber, tell me that Rotterdamse Lloyd used chlorinated rubber primers and anti-fouling paints on the bottom of the *Schel de Lloyd* and found them to be virtually unaffected even after 32 months' service in both temperate and tropical waters. The fuel saving was due to the fact that the chlorinated rubber paint system remained smooth owing to freedom from corrosion and marine growths.

Another method of protecting ships' hulls is to maintain an exceedingly thin film of organotin compound in contact with the painted hull. An effective means of doing this consists of pumping air through a solution of the organotin compound and then dispersing the air around the ship's hull below the waterline from a system of plastics pipings having small perforations.

For people who like to muck about in smaller boats, the Tin Research Institute has reported an anti-fouling paint containing tributyltin oxide. This paint is effective against all forms of barnacles and boring worms.

Alembic

10,000 STOCKHOLDERS SUPPORT COURTAULDS

Courtaulds' directors say merger economies would be trivial

PROPOSALS of Courtaulds (summarised in CHEMICAL AGE last week) were accompanied by a statement on I.C.I.'s bid and were followed this week by meetings at which the company's views were put to small investors (on Tuesday) and to the larger investment houses (on Thursday). Also this week, on Wednesday, Courtaulds opened an exhibition of their new fibre, BHS (p. 310).

On Tuesday it was stated that 10,000 of the 180,000 stockholders of Courtaulds had indicated that they supported their directors against I.C.I. In their statement to stockholders, the directors of Courtaulds declared that they "firmly believe that it is in your best interests to ignore the offers made to you on behalf of I.C.I." This belief is based on the view that Courtaulds' ordinary stock is worth more than the corresponding I.C.I. shares or loan stock and that I.C.I.'s take-over bid is unsound both commercially and industrially.

Support received

It is stated that Courtaulds have received the strongest support from their employees, from customers and from other interested people, including stockholders. They "profoundly regret that precipitate and wholly unexpected action by I.C.I. has led to a course of events which has been most distasteful, brought uneasiness to employees at all levels and caused the voicing of grave concern in both Houses of Parliament, in the Press and elsewhere".

Earlier statements that the exploratory discussions with I.C.I. never contemplated a take-over bid are repeated and it is added that "no detailed negotiations for a take-over have ever been conducted".

Courtaulds' directors believe that the fields of business of the two companies, their organisations and their industrial philosophies are so different that a take-over would fail to bring benefits to stockholders, employees or customers.

"I.C.I. directors seem to believe that by control of all the fibres and of all the raw materials they could regulate supplies to the market to suit the I.C.I. investment programme. Courtaulds know from their very much longer and wider experience in fibres that it is imperative to understand the needs of the customer and to meet them on a competitive basis".

The economies envisaged by I.C.I. are said to be trivial in relation to the turnover and profits of the two groups and

were mainly in research and promotion expenditure in the narrow field of Terylene.

The rapid growth in profitability expected by Courtaulds reflected both the effective action taken in recent years to overcome industrial problems and the development of new activities and fibres.

Despite a statement of Mr. S. P. Chambers that Courtaulds stockholders should compare the past performance of the two companies, their current position and their future prospects, Courtaulds state that nowhere are those comparisons made by Mr. Chambers or his advisers. This, says Courtaulds, is hardly surprising since "on all counts—net assets, past and present earnings and future prospects—the I.C.I. offer of 4-for-5 is totally inadequate."

The I.C.I. statement is said to give a misleading impression of that company's growth insofar as it only showed group income and did not disclose the issued capital to which such income was related. During the period quoted by I.C.I., that company had raised some £80 million by the issue of new ordinary capital. A

graph in the Courtaulds' statement shows that I.C.I.'s earnings per £ of issued ordinary capital were less in 1961 than in 1951; and that in 1961 and in all but three of the past 11 years, Courtaulds' earnings per £ of issued ordinary were greater than those of I.C.I.

Courtaulds then listed their four proposals (higher dividends, cash distribution of 2½% tax free, loan stock issue, and placing of main trade investments in a subsidiary investment trust) and give the following table, which shows the gross income that a holder of £100 Courtaulds ordinary could expect to receive under each of the three choices:

	1961-62	1962-63
	£ s.	£ s.
If I.C.I.'s 4-for-5 offer is accepted	10 0	11 0
If I.C.I.'s loan stock offer is accepted	10 0	16 5
If Courtaulds are supported:		
Ordinary dividend	12 10	13 (min.)
Gross equivalent of 2½% tax-free payment	4 0	4 0
Loan stock	—	3 10
	16 10	20 10

Mr. Chambers says Courtaulds' revised profit estimates should be treated with reserve

SINCE the proposals of Courtaulds were published on 21 February, I.C.I. have indicated that they do not intend to increase the terms of their offer. A further I.C.I. letter will be sent to Courtaulds' stockholders giving the company's views on the new proposals; in the meantime, Courtaulds' stockholders are advised to take no action on their company's proposals.

In their 16-page document, posted to Courtaulds' stockholders last week giving the formal offers made by I.C.I., Robert Fleming and Morgan Grenfell, on behalf of I.C.I., include notes on the history of the company and the relative strength of the two companies.

The document includes a letter from Mr. Chambers in which he refers to the Courtaulds' estimate of a 63%, or £11 million, increase in profits over the period 1961 to 1965. This is made up of a £4 million (79%) rise in profits from activities related to rayon for which Mr. Chambers says there is admitted excess world capacity and for which demand is relatively stagnant, and a £7 million (56%) increase from other fibres and investments. I.C.I. state that

the main contributor to the second group would be inference be Courtelle, "a good new member of the acrylic fibre range, but one still not through its development stage and currently earning only £700,000 per annum".

Mr. Chambers suggests that Courtaulds' profit estimates, in striking contrast to previous statements, be treated with some reserve.

Comparing the investment record of the two companies over the period 1926 to 15 December 1961, or just before the I.C.I. original offer was revealed, it is stated that £1,000 invested in I.C.I. ordinary on the formation of the company would by 15 December 1961 have become worth £8,230. A similar investment in Courtaulds over the same period would have risen in value to £1,663. So far as income was concerned, the investment by 1961 would be earning dividends at the rate of £384/year if invested in I.C.I. ordinary, but only £111/year if invested in Courtaulds.

Terms of the bid are set out in detail and in an appendix it is stated that I.C.I.'s group assets, worth £73 million at the end of their first financial year, had

grown to more than £700 million by the end of 1961. Since the war I.C.I.'s assets devoted to man-made fibres had grown from nothing to at least £100 million. In

the same period, I.C.I. had spent almost £12 million on fibre research.

Below is an extract of a table comparing profits and dividends:

Years ended 31 December	Group income before tax*	Tax	Group income after tax	Attributable to minority stockholders of subsidiaries	I.C.I. preference dividends (net)	£ millions	
						Group income after tax attributable to I.C.I. ordinary stockholders	I.C.I. ordinary dividends (net)
I.C.I.							
1951 ...	40.1	19.6	20.5	0.8	0.9	18.8	4.1
1957 ...	55.1	26.3	28.8	1.9	1.0	25.9	9.9
1958 ...	44.5	20.7	23.8	2.1	1.0	20.7	10.9
1959 ...	73.1	31.5	41.6	2.2	1.1	38.3	17.4
1960 ...	88.0	40.4	47.6	2.4	1.1	44.1	21.2
Courtaulds							
1952 ...	19.0	10.3	8.7	0.2	0.2	8.3	1.4
1958 ...	13.9	7.0	6.9	0.6	0.5	5.8	2.5
1959 ...	13.5	6.2	7.3	0.6	0.6	6.1	3.1
1960 ...	21.0	9.2	11.8	0.6	0.6	10.6	4.1
1961 ...	18.7	8.3	10.4	0.6	0.6	9.2	4.8

*This column includes gross dividends received on joint investment in British Nylon Spinners, but no part of the retained profits of B.N.S. which are attributable to such investment. Each group's share of such retained profits after tax (to nearest £100,000) was: 1951, £800,000; 1952, £600,000; 1953, £800,000; 1954, £1.4 m.; 1955, £2.2 m.; 1956, £1.5 m.; 1957, £1.7 m.; 1958, £600,000; 1959, £1.7 m.; 1960, £1.8 m.

Mr. Wormald accuses I.C.I. of seeking European cartels in fibres, nitrogen

A FIRST leader in *The Times*, commenting unfavourably on I.C.I.'s bid for Courtaulds and published on 14 February, was described in a letter on 15 February as being both unfair and misleading by Mr. S. Paul Chambers, I.C.I. chairman, while on 16 February a letter written by a director of Fisons which was highly critical of I.C.I. appeared in the same newspaper.

Author of the letter on 16 February was Mr. Avison Wormald, and like an earlier one that he wrote to *The Times* (C.A., 3 February, p. 202), it gave no indication of his connection with Fisons, but was published over his private address. (Mr. Wormald has resigned from Fisons, see page 310).

In this attack on another chemical company, Mr. Wormald says: "The need to eliminate Courtaulds' threat to nylon from the Snia nylon 6 process is now widely known and the desperate need to retain captive uses for its chemicals has been obvious."

He says that some of the probable strategic aims of I.C.I. have not attracted the attention they deserve. The first of these was to obtain complete control of the whole man-made fibres industry in the U.K. from raw material to yarn "in order to participate in a European Filtracartel, just as a European Nitrogen Cartel is already in an advanced stage of formation".

The second was to acquire Courtaulds' massive interests in the Common Market and the U.S. as bases for I.C.I.'s own expansion there. I.C.I. because of their own prewar cartel policy, now dissolved, had no worth-while manufacturing interests in either area.

Mr. Wormald adds that for too long I.C.I. policy had been directed to the wrong objectives: to restriction, not freedom; to processes, not products; to coercion, not collaboration; to size, not efficiency. The forced acquisition of Courtaulds could not put all that right. He concludes by calling on Mr. Chambers to "apply his undoubted courage and ingenuity to his task, using worthier

means. Let him put his own house in order".

I.C.I. have since told *CHEMICAL AGE* that there was no question of the company's entering any cartel and that they were not engaged in negotiations of any kind with European producers or anyone else. It was highly unlikely that I.C.I. would ever get involved in any arrangement of that nature.

The previous day, Mr. Chambers had replied to *The Times*' leading article. He said it quoted no facts or figures in respect of Courtaulds' performance, while of those it quoted relating to I.C.I., a number were inaccurate and the conclusions drawn were misleading.

He then gave six examples to show how I.C.I. had been misrepresented. *The Times* had said that I.C.I. spent under 3% of their turnover on research compared with a German figure of 4 to 5%. But declares Mr. Chambers, I.C.I.'s U.K. research spending in 1960 was between 4% and 5% of turnover, excluding sales of overseas production subsidiaries, most of which had their own independent research organisations.

The Times also said that a new research team (Beecham's) had made the most important recent development in penicillin. I.C.I., however, were not large producers of antibiotics, neither did they carry on research in that field. For a comparatively new entrant in drugs, I.C.I. had produced some outstanding discoveries—Fluothane, Mysoline and, with Glaxo, griseofulvin.

I.C.I. exports from the U.K. in 1960 were over 26% of U.K. production, and not 20% as stated; here *The Times* appeared to have related U.K. exports to I.C.I. Group production, including that of overseas subsidiaries.

Mr. Chambers agreed that as *The Times* said, I.C.I. sales between 1956 and 1960 expanded by 28%, compared with a German chemical sales rise of 77%. But in 1956 the German industry had not fully recovered from the war. An equally important comparison was the fact that

I.C.I.'s growth rate in the same period was about three times that for U.K. industry as a whole, whereas the German chemical industry's growth rate was less than twice the rate of all German industry. (See 'Leader', page 309).

I.C.I. chairman addresses Labour M.P.s

ON Tuesday evening, Mr. S. P. Chambers, chairman of I.C.I., addressed members of the trade union group of the Parliamentary Labour Party on monopolies.

Although Mr. Chambers' remarks were made in "closed session", it appears from the reports of political correspondents to have been a personal success. Most of his speech was concerned with the trend towards larger industrial groupings, rather than the present controversy. Mr. Chambers answered questions and after the meeting a Labour M.P. is reported to have said that he had "done a good night's work for himself and I.C.I."

Commons debate. On Wednesday, Mr. F. J. Erroil, President, Board of Trade, said that the stage had been reached in the B.O.T. enquiry into the trends in mergers, take-overs and monopolies when written submissions would be welcome from interested parties. There was much opposition during this debate and that on Friday to I.C.I.'s bid, both from Tory and Labour M.P.s. On Wednesday, Mr. D. Jay for the Opposition, wondered what would happen to the "big fish" like I.C.I. and Courtaulds if the "slumbering leviathan" of Royal Dutch/Shell ever turned predator. Shell, he said, had an average annual profit of £300 million, against I.C.I.'s £62 million.

Leak report. Commander L. Burt, former head of the Scotland Yard Special Branch, has completed his investigation into the "leak" of the I.C.I.-Courtaulds merger talks. His report has been presented to the companies, which jointly commissioned it.

Courtaulds meetings. Courtaulds' directors on Tuesday answered questions from members of the National Association of Investment Clubs and on Thursday were due to hold a similar meeting for the professional investors through the Society of Investment Analysts.

At Tuesday's meeting, Mr. A. W. Knight, finance director of Courtaulds, said that the profit estimates had been the work of a first-class management team. Both Mr. Knight and his fellow-director, Mr. R. J. Kerr-Muir, were confident that the bid would fail.

It was stated that the book value of Courtaulds' holding in Snia Viscosa amounted to £5 million, out of a total of £18 million.

Company meetings. I.C.I. will hold a meeting of shareholders to approve the creation of 75 million unclassified £1 shares on 16 March, provided that a satisfactory percentage of acceptances has been received in response to their approach to Courtaulds' stockholders, which went out this week.

Courtaulds' stockholders will meet on 15 March to consider their directors' proposals to counter I.C.I.'s bid.

Merger in chemical plant field

L. A. Mitchell—Metal Propellers link on process engineering

THE businesses of L. A. Mitchell Ltd., chemical and industrial drying engineers, 37 Peter Street, Manchester 2, and Metal Propellers Ltd., specialists in the fabrication of stainless steel, 74 Purley Way, Croydon, have been merged and are now under the control of a new company, L. A. Mitchell (Holdings) Ltd., Manchester.

As a result of the merger, L. A. Mitchell (Holdings) now become a subsidiary of S. Pearson Industries Ltd., a company in the Pearson family group.

The merger will provide a group strong in process engineering techniques. As recently disclosed in this journal, Mitchell's have a major interest in a new barium compounds project in India and last year handled expansion of the sorbitol plant for Howards of Ilford. Last week CHEMICAL AGE gave news of a recent arrangement by which Metal Propellers now have available an I.C.I. licence for formaldehyde.

The merger will increase the range of Mitchell's unit operations since Metal Propellers are in the distillation and filtration field and hold the Glistch licence for bubble caps. Mitchell's will also have greatly expanded fabrication facilities.

Metal Propellers will benefit from Mitchell's design skills and from their world-wide sales organisation. Joining these two groups with Pearson family interests should provide ample backing for future expansion plans.

All the companies in the group will continue to operate under their own names, but there will be close collaboration so as to benefit from the technical and selling and contracting experience gained by L. A. Mitchell over the past 40 years and the high-class stainless steel fabrication facilities available by Metal Propellers Ltd.

Subsidiary companies include Pratchitt Brothers Ltd., Carlisle, Chempump (Great Britain) Ltd., L. A. Mitchell (India), Ltd., L. A. Mitchell (Properties) Ltd., and the Standard Steel Co. (1929) Ltd. Mitchell Craig Pumps Ltd., Glasgow, are an associated company.

Board of the new company is: Mr. L. A. Mitchell, chairman; Lord Poole, C.B.E.; Mr. C. Colley; Mr. A. Dunn; and Mr. J. N. Mitchell. Mr. A. Dunn, Mr. J. H. Clayton and Mr. J. N. Mitchell have joined the board of Metal Propellers Ltd., and Mr. C. Colley has joined the board of L. A. Mitchell.

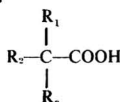
L. A. Mitchell are designers and suppliers of chemical plant and process equipment, fluid agitating and mixing equipment, acid pumps, filtration plant, industrial drying equipment, stoving plants, etc., to U.K. and overseas industries.

Metal Propellers are fabricators in all the corrosion and heat-resisting materials including stainless steel, Monel, nickel, Inconel, Hastelloy, titanium, etc., for the chemical, petrochemical, oil and other process industries. Their Standard Steel Division fabricates and erects structural steel equipment to customers' needs.

Important industrial uses expected for Shell's new synthetic organic acid

THE first of the new series of synthetic, organic acids recently developed by Shell International Chemical Co. (see CHEMICAL AGE, 5 August, 1961, p. 192) to be made and marketed in commercial quantities, is Versatic 911. It is a mixture of acids of 9 to 11 carbons in the molecules, most of which are tertiary acids and some of which have cyclic structure.

The structure of Versatic 911 may be represented as



where R_1 , R_2 and R_3 are alkyl groups. In general one of these alkyl groups is a methyl group and the other two are straight-chain alkyl groups.

The structure characteristic of Versatic 911 distinguishes it from the common straight-chain fatty acids of similar molecular weight, both in regard to chemical reactivity and to the properties of its derivatives. Thus the water and oil solubilities of the metal salts of Versatic 911 are greater than those of the corresponding fatty acids, the water and chemical resistance of its esters are superior, and the alcohol, obtained by hydrogenation of the acid, is a neo-pentyl type alcohol with the particular properties of this type of alcohol.

Versatic 911 is difficult to esterify but with certain specialised procedures, satisfactory yields can be obtained. Metal salts can be made according to the stabilised procedures current for paint dryers. Versatic 911 is a carboxylic acid and hence undergoes the other reactions associated with an organic acid, but modified procedures are often required.

Versatic 911 is expected to be of use in a great variety of industries, replacing to some extent acids such as lauric and naphthenic acids where Versatic could be used to advantage. Also many of the derivatives of Versatic 911, differing as they do from those of fatty acids be-

B.o.T. takes controls off dollar-area drugs

THE Board of Trade have announced that control is being removed from imports of pharmaceuticals from the Dollar Area. The Open General Import Licence will shortly be amended to give effect to the measure. It is not expected that any significant increase in the U.K.'s total import bill will result; dollar pharmaceuticals have been freely licensed over the past few years.

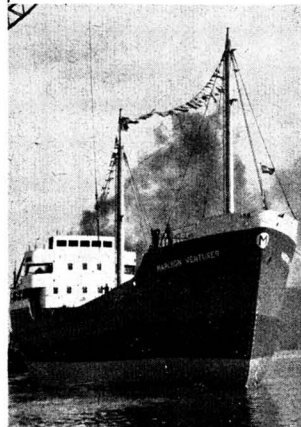
The Dollar Area consists of Bolivia, Canada, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador El Salvador, Guatemala, Haiti, Republic of Honduras, Liberia, Mexico, Nicaragua, Panama, Philippines, U.S. and Venezuela.

cause of the branch-chain structure, will give rise to many new, interesting applications.

Among the suggested applications is the replacement of fatty acids in alkyd-type resins, giving rise to resins with increased chemical and water resistance. Similarly esters of Versatic 911 could be considered for an application calling for esters of good thermal and chemical resistance such as in synthetic lubricants and plasticisers.

One obvious and established application, is as a paint drier acid.

Marchon launch new phosphate carrier



The 'Marchon Venturer', new phosphate-carrying ship of Marchon Products Ltd., was launched on Tyneside last week. A 2,400-ton sister ship of the 'Marchon Enterprise', launched last November, it will combine with the 'Enterprise' and the 'Trader' to carry almost all the phosphate requirements of Marchon's Whitehaven plant

Project News

SWINDON SITE FOR SHORKO'S POLYPROPYLENE FILM PLANT

A SITE at Swindon has been purchased to produce initially oriented polypropylene film by **Shorko Packaging (U.K.) Ltd.**, who were recently formed jointly by the Metal Box Co. Ltd. and Shorko Co. Ltd. (owned jointly by Shell and National Distillers and Chemical Corporation, U.S.). Initial investment in the first stages will be between £1.5 million and £2 million.

Manufacture at the U.K. factory is expected to start early in 1963 but film will be available on a commercial scale in a few months' time. A considerable proportion of output is expected to be used for packaging applications and sales in this field will be handled by the Plastics Group of Metal Box. (See 'People in the News', for directors of the new company.)

Recently I.C.I. announced that a plant to produce biaxially oriented polypropylene film would be in production at Dumfries by mid-1963. (CHEMICAL AGE, 13 January, p. 93).

New tonnage oxygen plant for Lancashire

● INSTRUCTIONS to install a 100 tons/day tonnage oxygen plant at Irlam steelworks for a 15-year tonnage oxygen supply contract have been received by **British Oxygen** from the **Lancashire Steel Manufacturing Co. Ltd.** The plant—costing about £500,000—will be owned and operated by British Oxygen who will supply up to 80 tons of high-purity oxygen per day to the steelworks for use in the open hearth furnaces and for

general purposes. The installation will include 500 tons of liquid oxygen storage and will be designed for future extension to meet any increase in the oxygen demand of the steel company.

Plans are being prepared for the balance of the oxygen from the plant to be supplied as liquid to other customers of British Oxygen in the area, and as compressed gas via a new pipeline link that will connect the tonnage oxygen plant to British Oxygen's existing oxygen compressing and distribution centre in Trafalgar Park.

Badger N.V. to build Esso's Botlek aromatics plant

● MAIN contractors for construction of **Esso Nederland's** new aromatics plant at Botlek, near Rotterdam, are **Badger N.V.**, Dutch affiliates of **Badger Ltd.**, London. The plant will have an initial capacity of 220,000 metric tons per year and will be the largest aromatics plant in Europe. Construction begins this year, with completion programmed for the last half of 1963 (see also CHEMICAL AGE, 23 December, p. 1001).

Equipment Contracts

Marston Excelsior heat exchangers for Polish oxygen project

● ALUMINIUM heat exchangers, vessels and pipework for the three tonnage oxygen and nitrogen plants to be built at Tarnow in Southern Poland as a basis for fertiliser manufacture, are to be sup-

plied by **Marston Excelsior Ltd.**—an I.C.I. subsidiary—under a contract worth more than half a million pounds. As reported in C.A., 12 August 1961, p. 222, the £2 million main contract for the oxygen and nitrogen plants was obtained from **Polimex**, the Polish Government trade organisation, by Constructors **John Brown Ltd.**, the design of the plants being the result of collaboration between **C.J.B.** and **Hydrocarbon Research Inc.** of New York whose air separation process will be used.

The plants will be constructed almost entirely of aluminium and will employ secondary surface heat exchangers, including large batteries of reversing heat exchangers for cooling and purifying the main feed air stream. The largest vessels will be the main columns, each 70 ft. long and weighing nearly 25 tons. The pipework will be shipped as large welded sub-assemblies to minimise the amount of welding on site.

Water supply line for I.C.I. Severnside

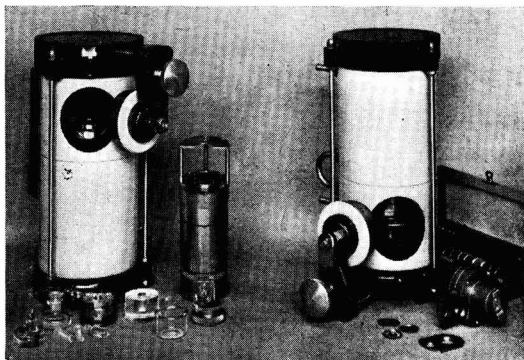
● SATISFACTORY progress is reported in the construction of the 17-mile pipeline from the Sharpness Canal, Glos., which will supply I.C.I.'s new ethylene derivatives complex on Severnside with 12 million gall./day of water, as well as a further 6 million gall./day for Bristol's domestic consumers.

The work is being carried out for the Bristol Waterworks Co. by **William Press and Son Ltd.**

Water treatment unit for Australia refinery

● A SECOND de-aerator, with a capacity of 500,000 lb./hr. has been ordered from the Hertfordshire firm of water treatment engineers, **William Boby and Co.**, for the Kurnell refinery at Sidney, Australia. The contract, worth £7,500, was placed by **Caltex Services Ltd.** on behalf of **Australian Oil Refining Pty. Ltd.**

Nuclear research equipment for Ceylon



British contribution to the new equipment now installed at the **Central Radioactive Laboratory of the Government of Ceylon**, at Colombo, was supplied by **Nuclear Research Applications Ltd.**, Reigate, Surrey, to the order of the **I.A.E.A.** in Vienna with a supplementary order from the **Crown Agents**. Main order included this low-energy beta counter, for which extremely high efficiency is claimed

Lummus move to new London offices

FROM 26 February, the offices of the **Lummus Co. Ltd.**, will be moved to **Monmouth House**, 58-64 City Road, London E.C.1 (Clerkenwell 8444).

The Lummus organisation, whose head office is in New York, now has subsidiaries in London, Paris, The Hague, Montreal and Madrid. The London office is the oldest European centre; it was established after World War II and employs over 400 staff in the U.K.

The various Lummus centres pool their technical experience and skills, thus offering a comprehensive service. Additionally, the London office has a special interest as the home of the **European Technical Centre (E.T.C.)**. A computer has been installed and the benefits of computer techniques with their complementary services are made available to the process engineering groups of all the Lummus European offices.

TITANIUM OXIDE IN THE FREE WORLD

Exploitation of new markets could raise consumption to 1.4 million tons by 1970

By
G. E. WATTS

Market research officer,
British Titan Products Co. Ltd.

IN the relatively short period of 45 years, titanium oxide, once a laboratory curiosity, has become an industrial intermediate of great importance, supporting a world-wide industry whose annual turnover is of the order of £170 million.

There are several reasons for this rapid growth. As a white pigment, titanium oxide offers considerably greater opacity than the older pigments, white lead, zinc oxide and lithopone. It is chemically inert and non-poisonous, and it is comparatively cheaper than the older pigments. In spite of certain deficiencies in the pigment originally produced after the first world war, demand grew rapidly.

The titanium bearing minerals from which titanium oxide is derived commercially are of two main varieties, ilmenite and rutile. Ilmenite, which was first identified by William Gregor in Cornwall in 1791, is a mixed crystal of iron oxide and titanium oxide, the TiO_2 content of which normally lies between 40% and 60%. Mineral rutile, on the other hand, contains 90 to 98% TiO_2 , usually associated with a certain amount of iron and silica.

Based on ilmenite

The great bulk of the titanium oxide produced today is derived from ilmenite, mainly because of its cheapness, and because it is suited to the sulphate process, which is normally employed.

There are no other important uses for ilmenite. Mineral rutile is less plentiful and much more expensive, and is only used as raw material for titanium oxide manufacture where the so-called chloride process is used. Most of the mineral rutile used today goes into welding rod coatings, and a further fairly substantial tonnage is used in the manufacture of titanium metal.

Titanium minerals are widely distributed throughout the world, but relatively few deposits are worked commercially on a really large scale. At the present time the U.S., India, Australia, Norway, Canada, Malaya, Finland, South Africa and West Africa are the largest producers of ilmenite. Australia is by far the most important source of mineral rutile, although a certain amount is produced in the U.S. and other countries. A large deposit has been found in Sierra Leone, but this is not being exploited at present.

As ilmenite is a cheap mineral, freight rates have a considerable influence on the effective price to the TiO_2 producer. One result is that the relatively low grade deposits of Europe and North America can be worked profitably, and are in fact worked on a large scale, because of their proximity to the main centres of TiO_2 production. Ilmenite produced elsewhere,

as in India, Australia and Malaya, normally has a relatively high TiO_2 content.

Recently growing use has been made of a process in which ilmenite is enriched by smelting, the end products being iron and a slag which is rich in TiO_2 . This process enables ores with a low TiO_2 content to be used. It is operated in Canada, and an installation in Norway has recently been proposed.

The first TiO_2 production units were located in the U.S. and Norway, and commercial quantities were made available immediately after the first world war. To begin with only composite pigments were produced (that is, co-precipitated pigments containing 25%-30% TiO_2 with an extender such as barium sulphate), but by the 1920's methods of producing pure titanium oxide pigments had been developed.

The new pigment was accepted quickly and more plants were built both in the U.S. and Europe, so that by 1930 titanium pigments were being made in France, Czechoslovakia, Italy, Germany and the U.K., as well as in the U.S.

Total world production at that time was probably not much more than 10,000 tons per annum, and more than half of this was made in the U.S. At the same time the U.S. alone was using annually about 150,000 tons of lithopone and about

100,000 tons each of white lead and zinc oxide.

During the 30's more TiO_2 plants were built (mainly in the U.S. and the U.K.) and the output of the existing plants was greatly increased, so that in 1939 about 100,000 tons of TiO_2 were produced throughout the world. Three quarters of this was made in U.S. plants.

The second world war, of course, meant that no further investment in new plant could take place for some years. It also resulted in damage to existing plants in Europe and Japan, and it was actually during the war that 'rutile' titanium pigments were introduced.

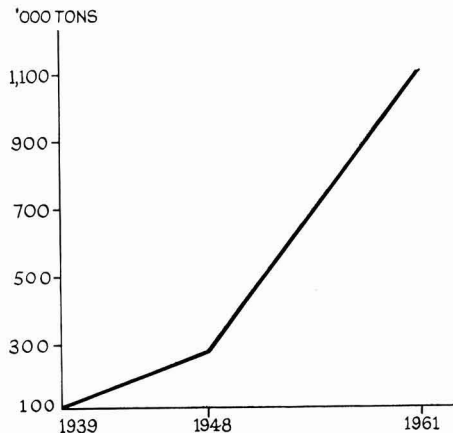
In the earlier pigments, the TiO_2 was in the crystalline form known as 'anatase.' These pigments suffered from the disadvantage that paints based on them tended to break down fairly rapidly by a process known as chalking.

The new synthetic rutile pigment (so called because its crystal structure is similar to that of natural mineral rutile) gave improved hiding power and much greater durability. From the point of view of the paint industry, rutile TiO_2 was a very attractive pigment indeed, and the production capacity existing at the end of the war was hopelessly inadequate to meet the demand.

Shortages of various kinds held up developments in Europe, but in the U.S. production was further expanded. By 1948 the U.S. was responsible for 90% of world production, which by then had risen to 260,000 tons.

After 1948 however, there was an enormous increase in capacity, especially in Europe and Japan, and in the last 13 years

RISE IN FREE WORLD TITANIUM OXIDE CAPACITY



U.K. consumption of TiO_2 for paints now 60,000 tons/year

some very large plants have been built. This has completely altered the relative importance of the main centres of production, and at the present time capacity inside the U.S. is approaching 600,000 tons per annum, while capacity outside the U.S. is about 500,000 tons per annum.

This very rapid rate of growth has been sustained by the fact that a number of favourable influences were at work. One of these has already been mentioned, namely that owing to its superior opacity TiO_2 has to a considerable extent displaced the other white pigments. Lithopone and white lead have been the pigments most affected (there are important non-pigmentary uses for zinc oxide) and in the U.S., where this process has gone farthest, the output of each of these pigments has been reduced during the last 30 years to one tenth of its former tonnage. In paint manufacture and application TiO_2 has the very important advantage over lead compounds that it is non-toxic, and this has helped greatly in its development.

However, the mere displacement of the other white pigments would not have required anything like the tonnage of TiO_2 currently being produced.

Other factors have included a substantial increase in the output of the pigment using industries, and even more important, a very substantial increase in pigmentation levels. In addition some completely new outlets for white pigments have been found.

Few countries publish satisfactory statistics of the consumption of TiO_2 , but the following official breakdown, which refers to the U.S., may be regarded as fairly typical of the situation in an advanced industrial country.

TiO_2 CONSUMPTION IN THE U.S.

	1945	1960
	Per cent	
Paint	73.4	58.5
Paper... ..	9.3	14.6
Linoleum, etc. ...	2.5	6.2
Rubber	1.6	4.9
Coated fabrics ...	2.0	3.5
Printing inks ...	1.4	1.7
Others	9.8	10.6
Total	100.0	100.0

The paint industry has always been by far the largest user of titanium pigments, but these U.S. figures are interesting in that they show that its relative importance has declined significantly over the years, while that of the paper, flooring and rubber industries has increased.

The paint industry provides a typical example of the way in which several factors have contributed towards a really striking increase in the consumption of titanium pigments. Over the past 30 years, there has been a substantial, though not particularly exceptional, increase in the production of surface coatings of all kinds. The rate of growth has been least in the most advanced countries such as the U.S. and Canada and

greatest in the relatively undeveloped countries, such as those of Latin America, where growth has been very considerable.

At the same time, there has been a pronounced world-wide trend towards the production of paints in lighter shades, and with greatly increased covering power. The development of 'one-coat' paints is the most obvious example of this. These trends were in turn made possible by the development of improved titanium pigments and of new types of paint media.

The production on a commercial scale of pure titanium pigments in the 1920's coincided with the introduction of synthetic resins of alkyd and other types which could not be used satisfactorily with the older white pigments. The whole range of modern finishes for motor cars and domestic equipment stemmed from the parallel development of titanium pigments and synthetic resin finishes. Emulsion paints constitute a more recent and most important example of this development.

As a result, the consumption of TiO_2 by the U.K. paint industry alone, which was put at 9,900 tons in the 1948 Census of Production, had risen to 30,100 tons by 1954 and must by now be approaching 60,000 tons per annum.

Generally, it is true to say that outside North America the paper industry is not such an important outlet as the figures in the table suggest. This is a case where titanium oxide has not displaced other pigments, but has created a new outlet for itself. Titanium pigments are particularly needed for thin airmail and bible papers, and increasingly used in paper coatings.

In the rubber and flooring industries, TiO_2 has displaced a considerable tonnage of zinc pigments, and contributed greatly towards the development of the lighter products which have been apparent in recent years.

Other important outlets, not shown in the table, are man-made fibres, where owing to its high refractive index TiO_2 is a

most effective delustrant, and vitreous enamels, where it is used as a chemical rather than a pigment, and has facilitated the production of enamels with high acid resistance.

The bulk of the world's production of titanium oxide pigments is in the hands of a dozen large firms or groups, whose factories are located mainly in the U.S., Western Europe and Japan. These groups, with their current and future production capacities, are shown in Table 2.

These 12 firms currently account for about 95% of total world production capacity, and although some of the smaller factories are being considerably expanded, and some new ones are being built, they will obviously continue to dominate the industry for many years to come. The three largest groups alone account for about 60% of total capacity.

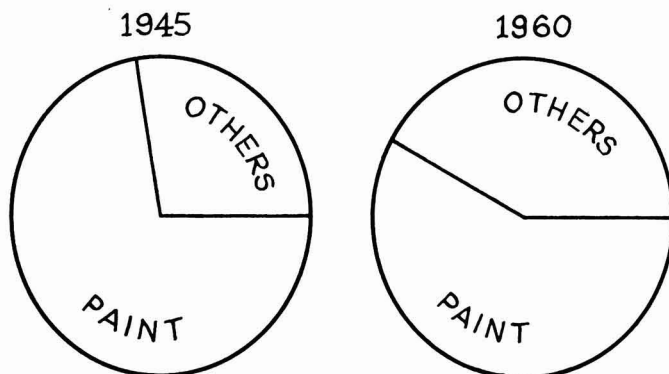
The very rapid growth in capacity in Western Europe and Japan in the last few years has already been mentioned. More recently there has developed a trend towards the establishment of TiO_2 plants outside Europe and the U.S. either by the major producers themselves, or by local interests in association with one or other of the major producers.

It seems likely that this trend will continue, for consumption in a number of countries has grown to a level capable of supporting a local plant, and in an industry where the quality of the product depends greatly on technical expertise, the accumulated knowledge of the established producers is extremely valuable. Several of the smaller firms, not shown separately, are in fact associated in one way or another with one of the major groups.

Reference has been made earlier to the sulphate and chloride processes. The first step in the manufacture of titanium pigments is to obtain a solution of titanium which is practically free from impurities, and commercially this can be either titanyl sulphate or titanium tetrachloride. Either of these can be hydrolysed to give titanium hydroxide, but economically the sulphate route is the more attractive. In this process the hydroxide is carefully calcined and treated to produce commercial pigments. It is a wet process calling for large precipitation tanks, filters etc., but construction

(Continued on page 322)

GROWTH OF NON-PAINT USES IN U.S.



NEW CHEMICALS FOR SURFACE COATINGS

O.C.C.A. Exhibition will feature many new developments

NEW products will be on show at the Oil and Colour Chemists Association's largest-yet exhibition to be held at the Old and New Halls of the Royal Horticultural Society, London, from 26 February to 1 March, 1962. This promises to be well attended by home and overseas visitors. Some of the newer developments are summarised in this special CHEMICAL AGE preview of the exhibition.

PIGMENTS

Flame retardant pigment

Associated Lead Manufacturers Ltd., 14-18 Gresham Street, London E.C.2, are devoting their 1962 exhibit to the latest development in the use of Timonix antimony oxide as a flame retardant pigment in paint. Formulations have been developed for undercoats, enamel finishes and emulsion paints. (Stand 96).

Coalescing agents

This year the main feature on the stand of **British Oxygen Chemicals Ltd.**, 24, Grafton Street, London, W.1, will be the study of the low temperature film forming properties of copolymer emulsion paints. The paints studied will contain various quantities and types of coalescing agents. (Stand 99)

Speciality organic pigments

To be shown by **Ciba Clayton Ltd.**, Clayton, Manchester, 11, is a range of Cromophytals—speciality organic pigments, including phthalocyanines and vat colours—for high quality oven and air drying industrial finishes, p.v.c. sheeting, spreading and flooring compositions. A new addition to Ciba pigment dispersions are the Pergantine aqueous high pigment, low dispersing agent content pastes, for use in emulsion paint mediums and for the beater dyeing of pulp for higher grade papers. (Stand 30)

New pigments and dyes

The **Geigy Company Ltd.**, Rhodes, Middleton, Manchester, will exhibit a number of new pigments for paint and a range of colours for printing on aluminium foil—yellow, blue and two reds of the Grasol and Irgacet ranges. New pigments will include a new version of Irgalite Yellow 2GP and a completely stabilised alpha form of Irgalite Fast Brilliant Blue BCS. (Stand 78)

New I.C.I. products

Three divisions of **Imperial Chemical Industries Ltd.**, Millbank, London, S.W.1, are to feature new products at the exhibition. The Dyestuffs Division will show several new physical forms of organic pigments of special value to the paint manufacturer. In addition three

new pigments for the plastics manufacturer will be on display for the first time.

The General Chemicals Division's display on Allopren will highlight some of the excellent results achieved in the development of thixotropic and marine paints based on chlorinated rubber. A small display will focus attention on the virtues of methylene chloride as the basis of efficient solvent-based paint removers and will list Methofas 65 HPM, methanol and Lissapol NX as being products of special interest in this field.

The Heavy Organic Chemicals Division will demonstrate the use of novel aromatic acids—isophthalic and trimellitic anhydride—in alkyd resins. These chemicals are of great interest in the manufacture of unsaturated polyester resins and plasticisers. Maleic anhydride, shortly to be made by I.C.I., will be featured from the point of view of demonstrating investigations into its use in unsaturated polyesters. (Stand 79)

Titanium nickel yellow

New applications for titanium nickel yellow will be demonstrated on the stand of **Laporte Titanium Ltd.**, 1-5, New Bond Street, London, W.1. There are many improvements in the pigments characteristics which have resulted in improved gloss characteristics. Items of special interest to paint manufacturers will be the development of 'seeding' in the milling of alkyd resin enamels and the assessment and elimination of sedimentation. (Stand 85)

Cellulose lacquer chips

Ranges of pigments dispersed in nitro-cellulose, cellulose acetate butyrate, vinyl

resins and ethylcellulose are to be shown on the stand of **Runnymede Dispersions Ltd.**, Windsor Road, Egham, Surrey. These pigments, which are in the form of chips, are semi-processed raw materials for the cellulose lacquer, cosmetic and printing ink trades. (Stand 25)

AUXILIARIES

Improved pigment dispersion

Armour Hess Chemicals Ltd., Brotherton Chambers, Leeds, 1, will show for the first time Armoblen S, a newly developed cationic system for improving pigment dispersion. Results of tests demonstrating this improvement will be presented graphically. Also displayed on their stand will be the Distec range of high purity acids from C8 up to C22 (Stand 92)

F. W. Berk exhibits

Further extension of the Oncor principle has produced Oncor 23A (antimony oxide) and Oncor T15 (lead titanate), the former for use as a flame-retardant in p.v.c. sheeting, plastisols and halogenated resin paints. T15 has been developed, also in the U.S., to give better chalk resistance and durability to exterior tinted paints. **F. W. Berk and Co. Ltd.**, 8 Baker Street, London, W.1, will also show new formulations based on bentone gellants, use of Bentone 18C as a suspending agent in aerosol packs; tall oil fatty acids, Uddeholms sodium carboxymethyl cellulose, p.v.c. stabilisers, Dicalite extenders and filter aids, organo-mercurials and microniser mills. (Stand 34)

New hydrocarbon solvents

Main feature on the stand of **Carlless, Capel and Leonard Ltd.**, Hackney Wick, London, E.9 will be a display unit which will show the comparison of the solvent powers at equivalent evaporation rates of certain aromatic and aliphatic products for the paint and allied industries. The display will illustrate how the new materials compare in these respects with some of the older solvents and diluents. (Stand 18)

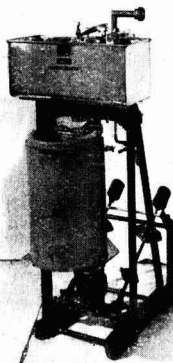
D.C.L. feature acrylates, solvents

New on the stand of the **Distillers Company Ltd.** Chemical Division will be acrylates. Their use as copolymers in emulsion paints, in stoving finishes and leather finishing will be featured. A new product, methoxyhexanone, a solvent with a medium/low rate of evaporation will also be shown and the physical properties described, with performance in typical surface coating resin solutions. D.C.L. will also exhibit ethylene dichloride as a more economic substitute for methylene dichloride in a paint stripping formulation. (Stand 80)

Monsanto anhydrides and acids

Maleic and phthalic anhydride, fumaric acid and styrene monomer will be the

Albro gravity weight filler



Albro No. 3 gravity weight operated filler for use with either wide neck, or small neck cans of up to 1 gall. capacity. By Albro Fillers and Engineering Co. Ltd., Ponders End, Middx.

O.C.C.A. TECHNICAL EXHIBITION

main subjects of the display by **Monsanto Chemicals Ltd.**, Victoria Street, London, S.W.1. The applications of these materials will be illustrated, and the relationship between the raw materials and polyester and alkyd resins will be highlighted. (Stand 35)

Organic peroxides

There have been two further additions to the range of organic peroxides by **Novadel Ltd.**, St. Annes Crescent, London, S.W.18, and these—Perkadox IPP and Trigonox TV—will be on the company's stand at the exhibition. Also new is a stabiliser, Estabex 2375, an epoxy ester. The application of this company's products to the surface coating and allied industries will be demonstrated. (Stand 67)

Union Carbide's developments

Union Carbide Ltd., 8 Grafton Street, London, W.1 will display all their new research and development products which have application in surface coatings industry. One of the main features will show how **Tergitol NP35** surface active agent and **Cello-size hydroxyethyl cellulose** have found favour in the preparation of pigment bases for various emulsion paints. Polyether intermediates for polyurethane coatings in those applications where impact resistance is of prime importance will be shown. Also featured will be epoxy coating intermediates and the applications of **Tergitol nonionic** and anionic surface active agents as emulsifiers, dispersing aids and wetting agents. (Stand 58)

Monomeric and dimeric acids

Chief exhibits shown by **Victor Wolf Ltd.**, Victoria Works, Croft Street, Clayton, Manchester, will be products and derivatives made from the company's monomeric and polymeric fatty acids. Comparative panels of tall oil alkyds with and without **Dedico** will be subjected to various tests to indicate that the inclusion of **Dedico** in the alkyds increases the scratch resistance. Improvements in alkyds stoved on copper and brass which can be made by the incorporation of **Dimac S** will also be demonstrated. (Stand 62)

New drying media

In the field of water soluble drying oils, a new product will be displayed by **Youghusband Stephens and Co. Ltd.**, London Road, Barking, Essex. Another part of the exhibit will be devoted to the applications of **gas-liquid chromatography** to the drying oil field. The results obtained for processed drying oils will be shown, as well as the utilisation of these results in analysis of linseed stand oils, litho varnishes and oleoresinous media. (Stand 63)

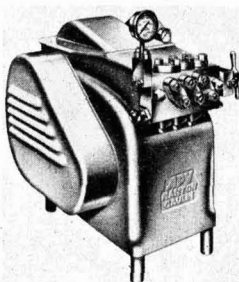
RESINS AND PLASTICISERS

New resins

Two new resins will be on display at the stand of **Allied Colloids Ltd.**, Low Moor, Bradford. These will be **Plastopal**

LR1046, which produces acid-hardening wood lacquers with six months pot-life and one hour drying time, and **Propiofan LR1060**, a vinyl propionate copolymer dispersion, from which emulsion paints will be shown on weathered panels. Another recent development on view will be the resin **Alkyphen P**, which is designed to improve the alkali resistance of tung oil varnishes. (Stand 60)

Sub-micron disperser



A.P.V. Manton-Gaulin sub-micron disperser for use with organic pigments, is said to lead to cleaner, brighter colours at lower cost. By the A.P.V. Company Ltd., Crawley, Sussex

Primers for plastisols

Bakelite Ltd., 12-18 Grosvenor Gardens, London, S.W.1, will be showing experimental resin **RW.26451**, a new resin solution for use in preparing primers for vinyl dispersion coatings of the plastisol or organosol type. It is claimed that better adhesion has been obtained from primers based on **RW.26451**. On this stand will also be displayed how limitations which sometimes appear in solution coatings based on vinyl resins have been partly overcome with the introduction of new resins. (Stand 93)

Pentaerythritol based alkyds

Of the new resins developed by **Beck, Koller and Co. (England) Ltd.**, Speke, Liverpool 24, several are to be featured. These include a long oil soya isophthalic alkyd for topside paints and similar situations where durability is of importance. During the past year an investigation of electrostatic spraying techniques has been conducted, and panels illustrating possible defects and means of overcoming them using **Beck Koller** resins and additives will be presented. (Stand 88)

Water-soluble paints

Main feature on the stand of **British Resin Products**, Devonshire House, Piccadilly London, W.1, will be a display of technical information about **Epok water soluble paint resins**. Finishes based on **VA acrylate co-polymer emulsions** will be on show, and their high pigment loading, high opacity and good adhesive qualities will be demonstrated. Also on

display will be a floor section finished in a cold-cure lacquer based on **Epok U 9043 urea resin**. (Stand 77)

New hardeners for epoxies

Two new hardeners for use in the formulation of coatings based on **Araldite epoxy resins** will be displayed by **CIBA (A.R.L.) Ltd.**, Duxford, Cambridge. One is a liquid modified adduct giving easily prepared solutions for use in high solids and conventional formulations. Resulting films have good flow properties and chemical resistance. The other is a liquid solvent-free hardener designed for use with the **Araldite GY 250/HY 830** system. It enables paint manufacturers to offer 2-pack solvent-free coatings which may be applied to metal, concrete etc., in films from 0.007 to 0.015 in. in thickness. (Stand 97)

Air drying polyesters

The stand of **Chemische Werke Huls A.G.**, Marl Kreis Recklinghausen, Germany, will display a range of air drying unsaturated polyesters, used not only as wood lacquers, but also in flooring compounds, patching cement for roads, and acid resistant coatings for buildings and open air structures. Recently developed copolymers for exterior paints and various applications of styrene/butadiene latex emulsions will also be shown. (Stand 4)

Flexible epoxy resins

Of special interest on the stand of **Dow Chemical Co. (U.K.) Ltd.**, 48 Charles Street, London, W.1, are two flexible epoxy resins—**DER 732** and **DER 736**—which are new to the U.K. Based on straight chain diglycidyl ethers, they are of differing molecular weights. In providing flexibility to conventional epoxies, they give a long chain innately flexible polymer throughout an otherwise densely cross-linked cured epoxy mass. The method by which the new resins act is said to be distinct from known methods, such as modification by inert plasticiser or special hardener. Also shown will be **Methocel** (Dow methyl cellulose), **Ethocel** (Dow ethyl cellulose), and **Dow epoxy resins**. (Stand 40)

Information on Polimul 995

Principal theme of **Dunlop Chemical Products Division**, Chester Road Factory, Erdington, Birmingham 84, will be the provision of technical information on **Polimul 995 copolymer emulsion**. Other products to be featured include **homopolymer and 100% acrylic emulsions** and **styrene-butadiene latices**, together with comparative technical assessments of these materials. (Stand 36)

Recently developed resins

Farbenfabriken Bayer AG, Leverkusen, Germany, will display an extensive range of new products including **Desmalkyd L 163** and **Desmalkyd RS 165**. These two products are in the Bayer line of vegetable oils, polyols and isocyanate, and are claimed to have dry-

ing properties, high abrasion strength, good chemical resistance and excellent wetting power for hydrophobic pigments. Also on display will be the recently developed Roskydal tix 18, which is a modified unsaturated polyester which hardens to give clear polymers. (Stand 76)

Styrene acrylate resins

Two new resins—Pliolite AC-VT and Pliolite AC3 (a non-sagging additive) will be displayed on the stand of the **Goodyear Tyre and Rubber Co. (Gt. Britain) Ltd.**, Wolverhampton, this year. Standard lines on display will include various solution viscosity grades of Pliolite S-5 (styrene butadiene) resin. (Stand 61)

Resins for stoving primers

Kunstharsfabriek Synthese NV of Katwijk aan Zee, Holland, will be showing, among the new resins now available for commercial investigation, Setalon PX-15, a synthetic resin for use in water-based stoving primers, and Setal PX-4033, an isophthalic D.C.O. based stoving alkyd for primers with high water resistance. (Stand 33)

Rapid air drying resins

Plastanon Ltd., Belvedere, Kent, will draw particular attention to their range of new resins, and these will include Plastyrol T-15, a resin made specifically to meet the demand for rapid drying brushing finishes and Plastyrol T-51, a vinylated alkyd resin that will air dry in 1½ hours and can be recoated after four hours. In conjunction with Union Chimique Belge, examples will be shown of pure acrylic resins for use in surface coating and other fields, in the form of solutions and emulsions. (Stand 91)

Polymerised fatty acids

A new system based on Bakelite epoxide resin 201 cured with polymerised fatty acid Empol 1024, claimed to be advantageous where thermal and chemical resistance at low cost is desired will be featured on the stand of **Price's (Bromborough) Ltd.**, Bromborough Pool, Bebington, Ches. Also on display will be Emfac 1202 pelargonic acid which has the property of complete saturation and will give outstanding stain resistance, hardness and gloss. The range of Plastolein polymeric plasticisers, recommended for applications where it is desirable that plasticiser migration into surface coating does not take place, will be shown. (Stand 84)

Unique acrylic resin

Among other new developments featured by **Resinous Chemicals Ltd.**, Blyndon, Co. Durham, will be a unique thermosetting acrylic Wresacryl, which may be stoved at 120°C. Proof of cure at this temperature will be demonstrated at their stand. A special printing ink section is to cover a new VT modified version of the Wresinol 3000 series of isophthalic linseed alkyds. (Stand 28)

New cross-linking acrylics

Scott Bader and Co. Ltd., Wollaston, Wellingborough, Northamptonshire, will be exhibiting two new cross-linking acrylic emulsions, Texicryls DP.304.CA and DP.305.CA., which have been specifically designed for the production of water based stoving paints. Also to be shown will be the work that led to the development of Polidene vinylidene chloride emulsion for air drying paints. (Stand 19)

Epikote-based primers

Shell Chemical Co. Ltd., 170, Piccadilly, London, W.1., will demonstrate the use of liquid Epikote resins in surface coating formulations. Solventless Epikote resin systems and Epikote resin coal tar coatings will be highlighted. In addition, a special feature will show resin based zinc-rich primers, a recently developed formulation of particular interest to the shipbuilding and structural steelwork industries. Isoeyanate cured Epikote resin systems will also be displayed. (Stand 81)

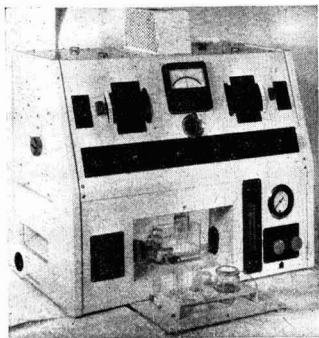
Acrylic stoving finishes

Vinacryl 3001, a versatile new acrylic resin solution which cross-links with melamine-formaldehyde, urea-formaldehyde and epoxy resins to give one coat stoving finishes, will be shown by **Vinyl Products Ltd.**, Butter Hill, Carshalton, Surrey. The latest developments in the ranges of Vinamul synthetic resin emulsions, and Vinalak polymer solutions are to be demonstrated on the stand. (Stand 69)

INSTRUMENTS

Baldwin photometers

Baldwin Industrial Controls, Dartford, Kent, will be exhibiting instruments which are of interest to the chemical industry. The flame photometer, an



Flame photometer, with sample tray in position

instrument for measuring concentrations of calcium, sodium and other metal ions in solution will be highlighted. (Stand 15)

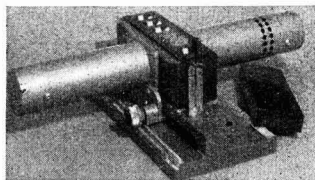
O.C.C.A. TECHNICAL EXHIBITION

Particle size counter

An instrument which will count and size small particles from 0.2 microns at a rate of 5,000 per second will be shown by **Coulter Electronics Ltd.**, 2-4 Ashwell Street, St. Albans, Herts. This instrument will be of particular interest to those engaged in the quality control of pigments and extenders, as a complete particle size distribution can be undertaken in a few hours, and maximum size process control can be carried out 'on stream'. (Stand 48)

Sedimentometer

On display at the stand of **Evans Electro Selenium Ltd.**, St. Andrews Works, Halstead, Essex, is the EEL sedimentometer. Particles in the sub-sieve size

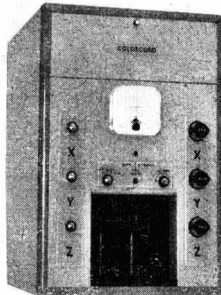


EEL sedimentometer

may be sized and the advantages of the photo-extinction sedimentometer are that the sample of powder required is small, dilute solutions may be employed, the sample is not disturbed during measurement and full advantage may be taken of thermal insulation. (Stand 72)

Colour measuring instrument

Joyce, Loeb and Co. Ltd., Team Valley, Gateshead-on-Tyne, will be exhibiting a new colour measuring



New colour measuring instrument

instrument. It is designed specifically for the measurement of small colour differences and embodies three mosaic type filters to conform to C.I.E. specification. The read-out is shown on three digital counters, which is of considerable assistance when measuring samples which show small colour differences. (Stand 10)

EQUIPMENT AND MACHINERY

Automatic mill

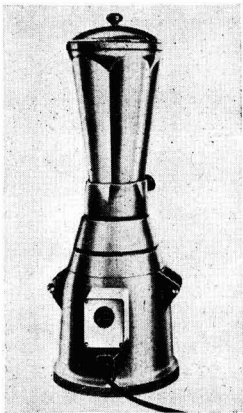
Two new 3-roller mills will be exhibited by **Buhler Brothers (England) Ltd.**, Cockfosters, Herts. Each machine

O.C.C.A. TECHNICAL EXHIBITION

will have a novelty. The mechanical SDL laboratory mill will have 4 hand-wheels instead of only two, thus giving the possibility of setting each passage individually with respect to roller pressure. The SDA, a fully hydraulic and automatic 3-roller mill, will be shown for the first time in this country with some new features, such as a mixing facility, hydraulic counter pressure, filling up device and two speed gear. (Stand 39)

New Kek equipment

Among new equipment to be exhibited this year by Kek Ltd., Palmers'on Street, Manchester, 12, will be a typical Gericke electromagnetic vibrating feeder, an Opti-mill electronic control apparatus, and a Turmix industrial mixer, disintegrator,



Turmix mixer, disintegrator and emulsifier

dissolver and emulsifier. The latter has been developed as a general purpose small batch machine and its applications include printing ink mixing, size dissolving and regenerating dried paints and inks. It may be used on wet or dry materials. (Stand 43)

M.P.L.'s new plant

Metal Propellers Ltd., 74, Purley Way, Croydon, Surrey, will be displaying a ½-ton stainless steel general-purpose plant employing a simple and most economic system of circulated oil heated by gas. Information will also be available on a new type of extraction unit offering extremely high product yield, with low space requirements and overall cost. As stated in CHEMICAL AGE last week, this company now has available, under arrangements with I.C.I., a licence for formaldehyde. (Stand 68)

New colloid mill

A new colloid mill will be featured on the stand of L. A. Mitchell Ltd., 37, Peter Street, Manchester 2. This mill, the PUC Vikosator colloid mill, embraces the latest developments recommended for dispersion paints, leather body colours,

synthetic resin varnishes, artists colours, pigment colours, titanium oxide, ceramic colours, inks, emulsion paints, oil paints, alum, shellac and printing inks. (Stand 55)

5-Micron filtration

Micro-Klean depth-type filter cartridges for the rapid and effective filtration of paints, varnishes and enamels down to 5 microns and below will be shown among other exhibits on the stand of Morris and Ingram (London) Ltd., 114, Kingston

Road, London, S.W.19. Also on display will be Micro-Wynd wound cellulose cartridges for the fine filtration of aromatic solvents, alkyl resins and oils, and Micro-Screen gauze strainers. (Stand 41)

Mixing machines

Winkworth Machinery Ltd., 65 High Street, Staines, Middlesex, will be exhibiting their range of mixers, with special emphasis on the twin 'Z' bladed, easy-to-clean pint and quart capacity mixing machines. These machines can be equipped with variable speed drives, steam or electric heating, for vacuum operation and with various blade forms, to suit the needs of research chemists in the oil and colour industries. (Stand 96)

Titanium oxide producers take steps to meet increasing consumption (from page 318)

materials are relatively simple and cheap.

Titanium tetrachloride can be converted to titanium dioxide by a dry process in which it is simply burned in air or oxygen, releasing chlorine. The plant required for this process is smaller than that required for the sulphate route, but it is more difficult to control than a precipitation process, and the constructional materials, which must withstand high temperatures and high concentrations of chlorine or hydrochloric acid, are much more expensive.

For some industrial paint applications chloride process pigments offer advantages, while for high durability paints sulphate pigments are preferred. Progress and improvement are taking place in both processes, and both will be used for many

years to come. The decision as to which process should be used in a new factory depends on many factors, particularly the size of the production unit and the local availability and cost of raw materials.

Throughout its relatively short history the titanium pigment industry has been characterised by rapid and continuous product development, as well as a striking rate of growth.

There is no reason to suppose that the technical and commercial potentialities of the product have been fully exploited even yet, and it is quite possible to foresee that world TiO₂ consumption, which in 1961 probably amounted to about 850,000 tons, may reach 1,400,000 tons by 1970. The TiO₂ producers are well aware of this, and have already taken steps to meet the increase in demand.

Titanium oxide capacity outside Communist bloc

Company	Location of plant	Capacity end 1961 tons	Planned capacity tons
National Lead	U.S., Canada, Western Germany, Belgium	373,000	390,000
E.I. du Pont de Nemours ...	U.S., Mexico	165,000	190,000
British Titan Products ...	U.K., Australia, South Africa. Plant under construction in Canada	128,000	167,000
American Cynamid	U.S.	80,000	80,000
Bayer	Western Germany	60,000	70,000
Glidden	U.S.	50,000	50,000
New Jersey Zinc	U.S.	43,000	43,000
Laporte	U.K. Plant under construction in Australia	40,000	60,000
Montecatini	Italy	40,000	40,000
Ishihara	Japan	36,000	60,000
Pechiney-St. Gobain	France	31,000	50,000
Vuorikemia	Finland	16,000	20,000
Others	Western Europe, Japan, India, U.S., Canada and Latin America	52,000	170,000
Total		1,114,000	1,390,000

Overseas News

SHORTAGE OF RAW MATERIALS HOLDS UP SINDRI FERTILISERS

THE Rourkela fertiliser plant in India is expected to be completed in September this year, after a nine-month delay, which has been attributed mainly to "organisational difficulties". This plant, owned by Hindustan Steel Ltd., is designed to produce about 2,000 tons of calcium ammonium nitrate a day.

It is being constructed in two major sections, one for ammonia and the other for fertiliser processing. The Ude ammonia project is practically completed. Contract for the nitric acid and nitro-limestone plants was awarded to the Sindri Fertiliser Works, now absorbed in the larger Fertiliser Corporation of India. These two units are claimed to be the largest of their kind ever built.

Despite an appreciable improvement in the production of ammonium sulphate at Sindri, the original production target is yet to be reached. Following difficulties in obtaining supplies of gypsum, a technical committee of Indian and foreign experts, has now recommended that Sindri should switch from its present gypsum-based process to the 'direct-acid' route. Should this change be made, Sindri's supply of by-product calcium carbonate to the nearby Associated Cement Companies plant will cease.

Shortage of Rajasthan gypsum—some 2,000 tons/day are needed—forced a partial shut down in October 1961 and led to proposals now being studied that gypsum should be imported from Pakistan and Egypt.

Phosphorus plant for Norway ?

According to a statement made by the Norwegian Embassy in Washington, two non-Norwegian companies are planning the establishment of a phosphorus processing plant in northern Norway. The plant would be sited at Ballangen, would be powered by electricity and would probably need expenditure of between £4 million and £5 million.

Identity of the two companies is not known; Albright and Wilson, the U.K. phosphorus manufacturers, are not involved.

98% success claimed for measles vaccine

The live measles vaccine developed by the Lederle Division of Cyanamid is claimed to have been 98% effective when it was used in a clinical trial involving 588 children. The vaccine was developed from a strain of measles originally isolated by a Harvard Medical School scientist.

Infants under one year of age appear to tolerate the vaccine as well as older children. In the case of children under

eight months old, the number of successful vaccinations decreased significantly because of lingering antibodies received from the mother.

Chas. Pfizer and Co. claim that their new measles vaccines is 96% effective in preventing measles, without fever and other symptoms associated with live-virus vaccine. The Pfizer vaccine is of the killed-virus type, length of immunisation is still to be ascertained.

Linde sell French selling rights to Gaz et Eau group

The Wiesbaden, Germany, chemical plant producer Gesellschaft für Linde's Eismaschinen AG have transferred their sole selling rights in France to the Pictet and Diener companies, both members of the Gaz et Eau group. This follows the recent formation of a working partnership with the van Swaay concern in Holland.

Snia Viscosa and Montecatini granted oil concessions

Snia Viscosa and Montecatini have been awarded concessions, in partnership with the French state-controlled oil company Prepa, to prospect a site in the Erg Iguidi area of the Sahara. The two Italian companies will be acting through their subsidiaries SAICI and Petrosud.

British Petroleum put in an unsuccessful application for concessions in the area through their subsidiary Société Saharienne de Recherches Pétrolières.

Australian enquiry on sulphuric acid bounty

The Australian Minister for Trade has referred to the Tariff Board for enquiry and report the question whether a bounty should be payable on sulphuric acid produced from lead concentrate gas of Australian origin; and if so found, what rates of bounty should apply, and from what date and under what conditions should such bounty be payable. This reference has been made as a result of representations from local manufacturers.

U.K. trade associations or firms intending to submit evidence to the Tariff Board, should advise the Commercial Relations and Exports Department, Board of Trade, Horse Guards Avenue, London, S.W.1, quoting reference No. C.R.E. 1591/62, not later than 5 March.

Dead Sea expansion programme includes increased capacities for potash and bromine

DETAILS of the expansion plans of Dead Sea Works Ltd. are given in the annual report. Potash capacity is to be increased to 590,000 tons/year, plans including the construction of additional plants for the production of 400,000 tons/year of potash from carnalite produced in a projected new system of sea water concentration pans. Bromine capacity will be raised to 10,000 tons/year by new facilities and there will be completely new plant for the production of bromine compounds with a capacity equal to a bromine content of 2,000 tons/year.

Dead Sea Magnesite Co. Ltd.—50% owned by Dead Sea Works—will build a 75,000 tons/year plant to produce dead-burned magnesite. Dead Sea Works' plans also include a plant to produce 20,000 tons/year of table salt from end brine and from the waste salt resulting from potash production.

Luwa AG to expand plant production facilities

The Swiss chemical plant producers Luwa AG, Zurich, are planning new works for the production of industrial filters outside the city limits of Zurich. At the same time, chemical plant production at the Muri, Canton Argovia, works of Otto Wild AG, taken over by Luwa last year is to be moved into new production shops. Luwa are also to build

a special research centre to cover aspects of industrial chemical technology as yet not tackled by any scientific organisation in the West.

Socabu's butyl rubber output 20,000 tons in 1961

Socabu (Société du Caoutchouc Butyl) produced 17,500 tons of butyl rubber during 1960 and it is expected that the output figure for 1961 will be 20,000 tons when confirmed.

Canadian synthetic rubber output

Canadian production of synthetic rubber over the first 11 months of 1961 totalled 150,332 tons compared with 145,737 tons for the same period of 1960. Consumption was 57,119 tons against 51,328.

Procofrance to build Thailand refinery

Cie Industrielle et Agricole de Vente a l'Etranger (for financing and Soc. Procofrance, owned by Procon of the U.S. and Damiron et Cie (for construction) are to build a \$28 million refinery near Bangkok with a capacity of 35,000 bbl./day. Operators are the Thai Oil Refinery Co.

Overseas News

AMMONIA AND METHANOL AMONG PLANTS LONZA PLAN FOR SWITZERLAND

PRODUCTION of ammonia and methanol are proposed at a synthesis gas unit to form part of a petrochemical plant planned for Lalden, Switzerland, by the Basle-based chemical company Lonza AG. Acetylene and ethylene are also to be manufactured at the Lalden works, for which construction orders worth some S.Fr. 3 million have already been placed. Refinery gas is expected to form the main raw material base of the new plant, preparations having begun at Aigle, Switzerland, on the building of mineral oil refining facilities.

New to the technical-scale production programme of the Lonza concern are to be a number of prussic acid derivatives produced by a Lonza process; test-run manufacture of such products as cyanoacetic ester, malonic acid, barbituric acid and cyanuric chloride is already in hand. Silicon of very high purity and high-purity germanium and indium are to be produced at other planned Lonza units.

Chemical plant excluded from Argentine import ban

Production units for the petrochemical and cellulose industries are excluded from a general ban issued by the Argentine Government on duty-free import of production plant.

German synthetic fibres project for Spain

The Hamburg, Federal Germany, concern Glasurit-Werke M. Winkelmann AG are reported to be negotiating in Spain for the production of synthetic and nitro-cellulose fibres. Glasurit-Werke already co-operate with the Urruzola S.A. of Spain, and are to intensify this co-operation.

Chemical projects in Puerto Rico

Petrochemical production is to be taken up by the Puerto Rican mineral oil refining concern Commonwealth Oil Refining Co., of San Juan, the manufacturing programme to start next January with the production of naphthalene. This will be produced by the hydro-alkylation process of Universal Oil Products Co., of the United States, initial annual capacity to be of 22,300 short tons. The project, to be carried out by the Commonwealth Oil subsidiary Corco Petrochemicals Co., will cost some 6,500,000 dollars. The plant will also be used for benzene production, while that of toluene, xylene and phenol is planned for the future.

Most of the naphthalene to be produced at the Corco plant will be sold to another Puerto Rican chemical project, the Stepan Caribe Co.'s phthalic anhydride unit to open at the end of this year.

Stepan Caribe, a subsidiary of the Chicago company Stepan Chemical Co., will produce up to 18,000 annual short tons by the German von Heyden-Zieren process.

D.S.M. Dow phenol plant due on stream in 1963

The Dutch Minister for Economic Affairs, de Pous, has stated in Parliament that the phenol plant being constructed in the Botlek area of Rotterdam by the State-owned Staatsmijnen concern and the Dow Chemical Co. will come on stream in the middle of next year.

Israel removes chemical duties

Chemical and dyestuff industry products are among a comprehensive list of commodities, for which import duties have been removed by the Israeli Government. These liberalisation measures follow the devaluation of Israeli's currency.

Provisional agreement on Rhodesian refinery signed after long negotiations

THE long-negotiated agreement on the £10 million oil refinery near Umtali, Southern Rhodesia, was signed in Salisbury by representatives of the Federal Government and of the consortium of oil companies participating in the project—Shell, B.P., Vacuum, Caltex, Total, American Independent Oil, and Kuwait National Petroleum. Under the agreement, the sponsors are committed to an expenditure of £250,000 on the proposed refinery.

However, the agreement is only provisional, being dependent on the satisfactory conclusion of negotiations with the Portuguese Government by the sponsors of the pipeline which will supply the refinery with feedstock from the port of Beira in the Portuguese territory of Mozambique. The pipeline agreement hinges on negotiations over the rate per ton at which crude will be carried.

S.D. process for Japanese ethylene oxide production

The Japanese concern, Nippon Soda Co., have applied to the Foreign Investment Council for approval of the introduction of the Scientific Design processes for ethylene oxide and ethylene glycol. The fee to be paid to Scientific Design is \$277,500 excluding royalties which will depend on the amount sold.

Nippon Soda are planning to construct plants with annual capacities of 12,000

Symposium on petrochemicals in Alberta

Resources, history, research, the primary and secondary industries, trends in specialised chemicals, transport and economics will be among the topics discussed at the Alberta Petrochemical Symposium at Edmonton, on 14 and 15 March. Organisers are the Chemical Institute of Canada. Papers to be read are: 'Reserves of raw material for the petrochemical industry in Alberta'; 'History of the petrochemical industry in Alberta'; 'Petrochemical research in Alberta'; 'Primary petrochemical manufacture'; 'Secondary petrochemical manufacture'; 'Production of olefins'; and 'Technology of carbon black'; as well as trends in rubber, plastics, agricultural chemicals and fertilisers.

Expansion for Swedish sodium chlorate project

Capacity of the new sodium chlorate plant being built by the Stockviksverken concern of northern Sweden is to be increased from 6,000 to 10,000 tonnes/year, the latter capacity to be reached by the coming autumn. The same company, a part of the Stockholms Superfosfaat Fabriks AB of Stockholm, is to raise capacities for both dicyano-diamide and melamine in the near future, that of the former product to be brought up to 6,000 tonnes.

tonnes of ethylene oxide and 7,500 tonnes of ethylene glycol. Total investment is estimated at 3,000 million yen and the plants are expected to be completed by July 1963. Nippon Soda expect to double the capacities of both these plants in 1966.

Saar mines to expand production of chemicals

The Saar coal-mining concern Saarbergwerke AG of Saarbrücken, have stated that the chemical processing of gas and coal derivatives is to be expanded by the company.

Cyanamid plan malathion plant in India

Cyanamid International, a division of American Cyanamid, are planning the construction of a malathion plant in Bulsar, India. The plant will be operated by Lederle Laboratories (India) Pty. Ltd.

Cyanamid already operate a pharmaceutical processing plant and an antibiotic fermentation unit at Bulsar; the construction and operation of the new plant, which is expected to go into operation early in 1963, will call for additional funds of \$2 million, the company states.

Cyanamid have also announced plans this year for the construction of a malathion plant in Sicily (see CHEMICAL AGE, 6 January, p. 13.)

I.F.C. surveys Iran prospects for new chemical facilities

A RECENT preliminary survey carried out by the International Finance Corporation into the potentialities of private investment in the chemical industry of Iran, although it did not yield conclusive evidence for the establishment of specific projects, was able to indicate areas which merit further investigation.

There are interesting possibilities in the fertiliser field. Although a Government-owned nitrogenous fertiliser plant is under construction, official forecasts of fertiliser consumption indicate that within a few years the output of the plant will not account for the requirements of the country. In addition, the consumption of phosphatic fertilisers, at present totally imported, is quite considerable. Furthermore, mixed complex fertilisers are preferred by the farmers and have, in fact, been recommended officially.

The targets recommended for 1967 for fertilisers are 40,000 tons of urea, 40,000 tons of ammonium nitrate, 45,000 tons of ammonium sulphate, 57,500 tons of triple superphosphate and 12,500 tons of potash. Ammonium nitrate and urea are both to be produced by the Government-owned plant.

Drugs and cosmetics

The consumption of pharmaceuticals and cosmetics in Iran has increased rapidly in the last few years. The total retail value in 1959/60 was about \$27 million. Consumption is expected to continue to grow. Domestic production is currently only about 10% of consumption and is limited to the relatively simpler operations of the pharmaceutical industry. The industry could be very easily expanded so that a greater amount of the less sophisticated products could be produced locally. However, it would be essential for the country to have in effective operation a Food and Drugs Act which includes the adoption of a standard pharmacopoeia before any expansion schemes are developed.

The situation of basic chemicals such as sodium carbonate, caustic soda, chlorine, sulphuric acid and potash are also discussed in the report. It is unlikely that there would be a case for the local manufacture of sodium carbonate, and any expansion of the caustic soda industry cannot be undertaken without some reasonable solution of the chlorine disposal problem. It is doubtful if much chlorine could be used in the manufacture of p.v.c. because of the limited demand for the plastic in Iran. Production of sulphuric acid is taken care of by the Oil Consortium and the Army; the Oil Consortium, who import as well as produce sulphuric acid, expects to be self sufficient by 1962. There are two ways in which the demand for sulphuric acid could increase substantially; firstly, if phosphatic fertilisers and ammonium sulphate were manufactured and

secondly, if a project for making viscose rayon could be justified.

No polymers are manufactured in Iran; p.v.c., polythene, polystyrene and other plastics are imported in relatively small quantities. It is unlikely that consumption of polythene and polystyrene would ever reach a level to warrant domestic production. Also the recently announced petrochemical complex under consideration in Kuwait is on such a scale that it could easily supply the whole of the Middle East.

C.S. symposium on carbohydrate chemistry

AN international symposium on carbohydrate chemistry, sponsored by the Chemical Society in association with Birmingham University, will be held in Birmingham on 16 to 20 July 1962. The full programme will include some 50 invited lectures and papers, and will be distributed in due course to all Fellows of the Chemical Society and to those who have already expressed an interest.

Additional copies will be available, not later than 30 March, from the general secretary, C.S., Burlington House, London W.1. Meanwhile, further details of the meeting are available from Dr. A. B. Foster, Chemistry Department, Birmingham University, Edgbaston, Birmingham.

Industrial research facilities for powders

DEVELOPMENT of the Research Council of the British Whiting Federation into an organisation concerned with the wider field of industrial powders was the main business discussed at the recent annual general meeting. Mr. A. H. Thorneloe, deputy director of research, Associated Portland Cement Manufacturers Ltd., as chairman of the Council, pointed out that the advantages of co-operative research were accepted by all progressive sections of industry, and hoped that manufacturers with interests in powders and dusts would wish

to be associated with this development. Both large and small organisations would be able to make good use of the library, technical information and laboratory services now available.

The director of research, Mr. D. C. Soul, who contributed a paper on whiting at the recent Society of Chemical Industry symposium on 'Powders in industry', will implement the Council's decision by making contact with people and organisations known to have interests in powder mechanics.

More U.K. firms to show at Leipzig

OVER 265 British firms, some 40 more than last year, will be exhibiting at the Leipzig Spring Trade Fair from 4 to 13 March. British participation includes an exhibit organised by the Federation of British Industries. Exhibitors include:

Machinery section: Baker Perkins (Exports) Ltd.; Manesty Machines Ltd.; Petrocarbon Developments Ltd.; Wogau Machinery Ltd.; Dominions Export Co. Ltd. with Sterling Colour Co. Ltd.; Sterling Moulding Materials Ltd.; Propane Co. Ltd.; Propane Fertilisers Ltd.; and United Sterling Corporation Ltd.; Commercial Plastics Ltd.; Monsanto Chemicals Ltd.; London Export Corporation Ltd.; Telcon Plastics Ltd.

Chemical section: Alginat Industries Ltd.; Bakelite Ltd.; BX Plastics Ltd.; I.C.I. with Billingham, Dyestuffs, General Chemicals, Heavy Organic Chemicals, Pharmaceutical and Plastics Divisions; Lewis and Peat (Overseas) Ltd. with Biddle, Sawyer and Co. Ltd.; Laporte Group with Fullers Earth Union Ltd.; Gibe Mines Ltd.; Howards of Ilford Ltd.; Laporte Chemicals Ltd.; Laporte Titanium Ltd.; Peter Spence and Sons Ltd.; and James Wilkinson and Son Ltd.

Chemical plant: Humphreys and Glasgow Ltd. with Isopad Ltd., Johnson and Phillips Ltd., George Kent Ltd., Langley Alloys Ltd., Oxley Engineering Co. Ltd., Q.V.F. Ltd., Sharples Process Engineers Ltd., Sumo Pumps Ltd., John Thompson (Wolverhampton) Ltd., Hayward Tyler and Co. Ltd., and G. and J. Weir Ltd.

Other exhibitors: Bran and Luebbe (Great Britain) Ltd.; Edwards High Vacuum Ltd.; Griffin and George (Sales) Ltd.; Hilger and Watts Ltd.; and the Pye Group.

Will

Mr. Reginald Arthur Warren, late chemical sales manager of I.C.I. in South Wales, who died on 21 November, left £8,802 net.

Merger polemics

(Continued from page 309)

The pace of development is not, as *The Times* maintains, set by the big firms in growth industries; it is set by Government policies and by the general state of the economy.

The Times, which in its vendetta against I.C.I., has strayed far from the paths of objectivity, published another and equally astonishing attack last week, the ethics of which are open to question. It was surprising to say the least that a reputable newspaper should allow a director of one chemical company to attack the motives of another chemical company in print, without disclosing the fact that the writer had a vested interest in the subject (see p. 314).

The lesson of this particular episode is that if this practice were to spread, it would completely destroy the amicable relations that chemical companies have enjoyed since the war. The strong possibility of Britain entering the Common Market will call for the fullest co-operation on the part of chemical companies and an atmosphere in which mutual problems can be discussed without re-priming.

A high-contrast, black and white photograph of a glass of water. The water is in motion, creating a series of concentric, swirling ripples that draw the eye towards the center. The lighting is dramatic, with bright highlights on the water's surface and deep shadows in the crevices of the swirls. In the upper left corner, there is a white diamond-shaped logo containing the word "DOW" in a bold, black, sans-serif font.

DOW

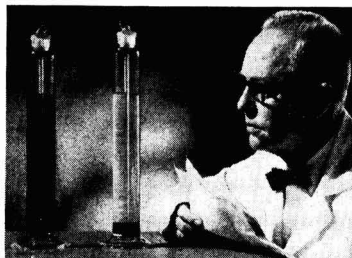
DOW EMULSIFIERS

higher viscosity • smaller particles
• greater stability

It's an easy matter to obtain almost any wanted emulsion characteristic. Simply formulate with Dow alkanolamines. The soaps of monoethanolamine (MEA), diethanolamine (DEA) and triethanolamine (TEA) produce stable, neutral, non-corrosive emulsions. By varying the alkanolamine-fatty acid ratio, component types, and emulsifying techniques, you can easily produce the exact degree of viscosity and other properties wanted.

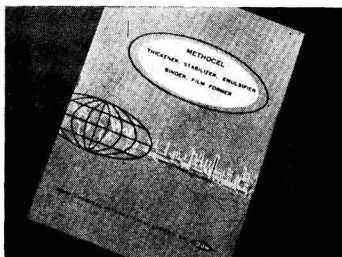
Emulsions which formerly required several different materials can often be made with a single Dow alkanolamine. This means a considerable saving in production time and costs. In addition, because they produce emulsions with fine particles and maximum stability, they help to make your product more saleable. And they help to keep it that way for maximum shelf life.

Whether you make polishing compounds, pharmaceuticals, cosmetics, or any of countless other products based on emulsions, you'll find the Dow alkanolamines can be profitable time- and trouble-savers for your operation.



Wetting and coupling agents. Both Benax*2A1 (anionic) and Dowfax 9N9 (nonionic) surfactants offer high solubility, surface activity and stability, in strong aqueous solutions of any pH. Use them for making cleaners of all kinds, sanitizers, emulsifiers, penetrants. Write for data and information on their use.

* Trademark of The Dow Chemical Company.



Unique thickener, surfactant. Methocel* —Dow methylcellulose—is an unusual thickening agent with surface active properties. Cold water-soluble Methocel is an effective thickener, emulsifier, emulsion stabilizer, suspending agent and binder. Ask for a copy of the Dow booklet on Methocel products.

*For information on any of Dow's products and services contact:
Dow Products Division, R. W. Greeff & Co. Ltd., Garrard
House, 31/45 Gresham Street, London, E.C.2. Telephone:
MONarch 1066.*

**DOW CHEMICALS basic to chemical processing: Alkylene Oxides, Glycols
Industrial Preservatives • Glycol Ethers • Polyalkylene Glycols • Brominated
and Chlorinated Aliphatic Compounds • Heat Transfer Media Organic Acids
and Esters • Inorganic Chlorides, Bromides and Bromates • Salicylates
Phenyl Phosphates • Chelating Agents • Ion Exchange Resins • Methyl
Cellulose • Ethanolamines**

DOW CHEMICAL COMPANY (U.K.) LTD.

48 Charles St., London, W.1
Telephone: GROsvenor 3601



● Council of the Chemical Society has awarded the Corday-Morgan Medal and Prize to **Professor R. N. Haszeldine**, Professor of Chemistry, Manchester College of Science and Technology, in consideration of his outstanding contributions to the chemistry of fluorine. The award, made in respect of 1960, consists of a silver medal and a monetary prize. It is made each year to the British chemist who is judged to have published the most meritorious contribution to experimental chemistry, and who at the date of publication was below the age of 36. Applications or recommendations in respect of 1961 must be received not later than 31 December 1961.

● **Dr. Marlo Scaler** has been appointed to the newly created post of technical director of Cyanamid International, a division of American Cyanamid Company.

● **Dr. James Taylor, M.B.E.**, a director of Imperial Chemical Industries Ltd., has been elected a Fellow of the Royal Society of Arts.

● **Mr. C. H. Goodwin** has been appointed general works manager of Chemstrand's Acrilan plant at Coleraine, N. Ireland, in succession to **Mr. J. Sosa**. Mr. Sosa will supervise all the nylon manufacturing operations of the Chemstrand Corp. in South America.

● The address of **Dr. A. J. V. Underwood's** consulting chemical engineering practice is incorrectly given in the CHEMICAL AGE DIRECTORY AND WHO'S WHO, 1962. It should have been 154 Hanover Road, London N.W.10.

● **Mr. Gregory Flint** has been appointed manager of market development and **Mr. John H. Cosgrove** as assistant manager of market development of Allied Chemical's International Division, based in New York.

● **Mr. A. M. Bremner** has been appointed technical adviser (plastics) to the chairman of Mobil Chemicals Ltd., **Mr. Derrick Kleeman**. **Mr. R. G. Thomas** has been appointed works manager, Thermoplastics Division, at the Erinoid Ltd. factory, Stroud, Glos.

● **Sir John Pascoe**, chairman of the Aberdare Group, has been elected chairman of the Neckar Water Softener Co. Ltd., and **Mr. A. J. Nicholas, C.B.E.**, joint managing director of the group, has joined the Neckar board. This follows

PEOPLE in the news

the recent appointment to the Neckar board of **Mr. Norman Care**, general sales manager of the Aberdare Group.

● **Mr. C. A. Murray, Jr.**, has been appointed managing director of British Tar Products Ltd. following the retirement of **Mr. A. E. Brown**.

● **Mr. Harry C. Hagerty**, formerly vice-chairman of Metropolitan Life Insurance Co., U.S., has been elected a director of W. R. Grace and Co.

● **Dr. P. Borrell** and **Dr. D. Cohen** have been appointed assistant lecturers in chemistry at the University College of North Staffordshire with effect from 1 October next.

● The title of Professor of Electrochemistry has been conferred on **Dr. D. J. G. Ives**, reader of chemistry at Birkbeck College, University of London, with effect from 1 October.

● First class passes in industrial chemistry for the Diploma of Technology have been gained by **M. J. F. DuCros**, Hull, **K. W. Farminer**, Cardiff, and **J. A. Spence**, Amersham, at the Northampton College of Advanced Technology, London.

● Research fellowships for chemistry awarded by the D.S.I.R. in 1961 went to **R. Payne** (Bristol University), **A. J. Edwards** (Birmingham), **G. V. Baddeley** (Cambridge) and **E. Steiner** (Edinburgh). These four chemistry fellowships are included in the 19 fellowships for various sciences and technologies awarded to workers of exceptional promise.

Some 17 fellowships and seven student-

ships for chemistry also went to workers in various U.K. and overseas research centres under the scheme launched two years ago by the North Atlantic Council to stimulate the international exchange of post-doctorate and post-graduate research workers.

● **Mr. Thomas Geoffrey Fallon**, while retaining his position as managing director of the Incandescent Heat Co. Ltd., has been appointed executive chairman of the Incandescent Group, Cornwall Road, Smethwick.



Sir Kenneth Hutchison, C.B.E., deputy chairman of the Gas Council, at Buckingham Palace on 13 February where he was knighted by the Queen. With him is Lady Hutchison

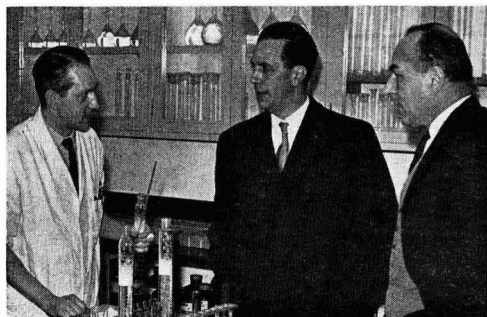
● **Dr. W. L. J. de Nie**, president of Shorko Ltd., has been elected chairman of Shorko Packaging (U.K.) Ltd., the new company formed to make polypropylene film at Swindon (see p. 311). Managing director is **Mr. D. J. Liston**, formerly general manager of the Plastics Group of Metal Box, who is succeeded in that position by **Mr. J. M. Jackson**, the deputy general manager. Other directors of Shorko Packaging are: **Mr. B. D. Ducat**, managing director of Metal Box; **Mr. N. A. Iliff**, managing director of Shell Chemical Co. Ltd.; and **Mr. H. J. Samuels**, president of Cordite Corporation, a division of National Distillers and Chemical Corporation, U.S.

S.C.I. annual meeting at Newcastle upon Tyne

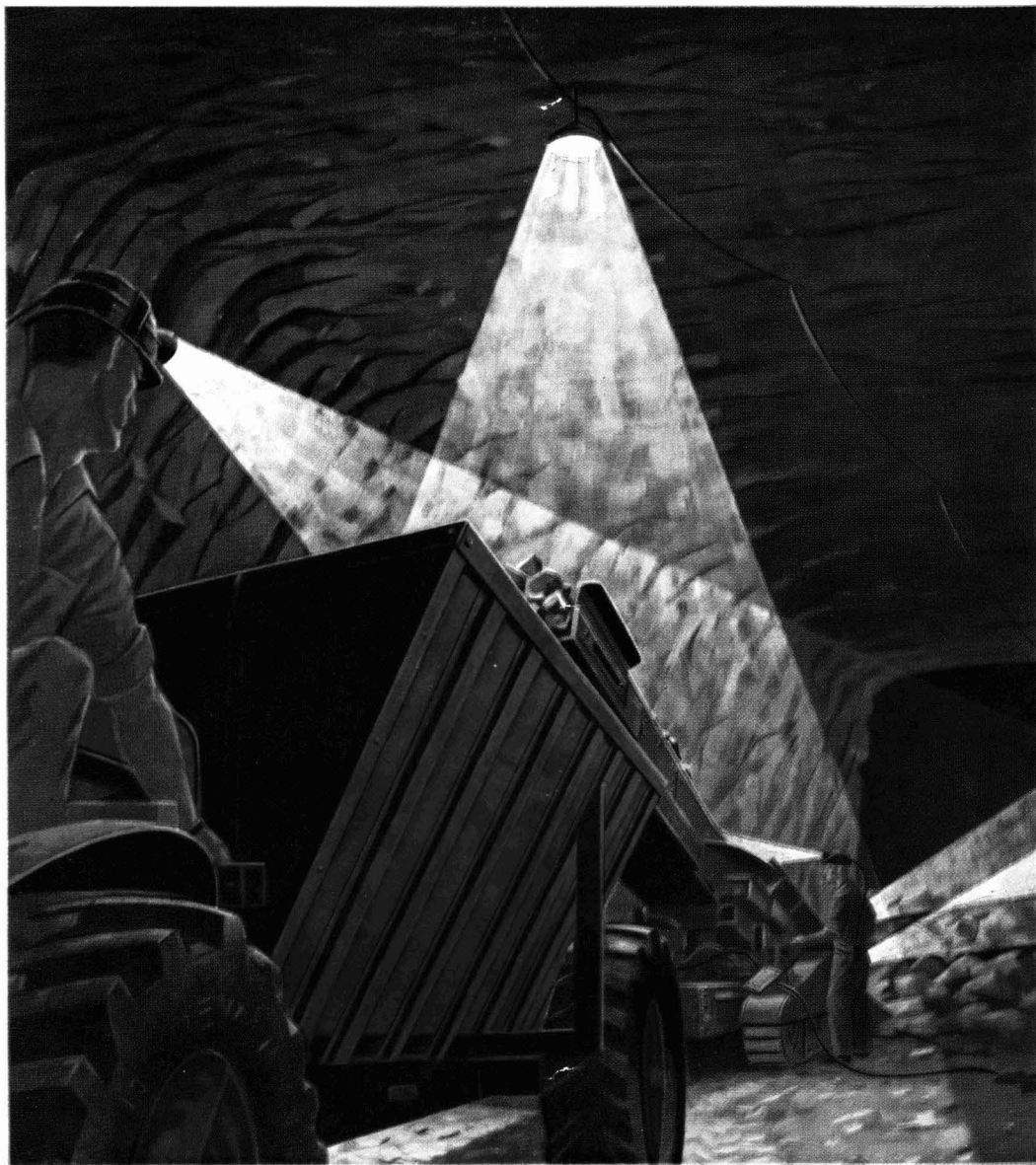
Annual meeting of the Society of Chemical Industry will this year be held at King's College, Newcastle upon Tyne from 9 July to 14 July. Lectures so far announced are 'Physics in the chemical industry', by **Sir Gordon Sutherland** and the **Dunn Memorial Lecture** by **Lord James of Rusholme**.

Aluminium price cut

A reduction of £6/ton in the price of 99.5% pure aluminium, bringing it to £180/ton delivered, has been announced by Alcan (U.K.) Ltd. This is the first change since December 1959 and follows the decision of Canadian Aluminium—parent company of Alcan (U.K.)—to reduce its export price.



Exports success of Evans Medical Ltd. led to a visit to their **Speke, Liverpool**, establishment by **Sir Keith Joseph**, Minister of State, Board of Trade. Photo shows him with **Dr. E. N. Glaser**, director of research (right), during a tour of the laboratories



MARCHON ECONOMY GOES DEEP

At Marchon's Whitehaven factory, production of detergent raw materials begins 500 feet below ground. Here, anhydrite is mined which, together with other raw materials, produces 500 tons of sulphuric acid every day. That Marchon has its own mine, and manufactures sulphuric acid on so large a scale, is one of the reasons why it can make detergent chemicals in Whitehaven and sell them competitively all over the world.

Marchon

Olefin- Production

by the Cracking of light and heavy Hydrocarbons in the

Sand Cracker

LURGI-RUHRGAS PROCESS

Sand Cracker for the production of olefins from 70,000 tons of light naphtha per annum

Feedstocks:

All petroleum products, ranging from liquefied gas to crude oil.

Products:

Ethylene, propylene, butylene and butadiene;
hydrogen and methane;
naphtha with a high content of aromatic hydrocarbons.

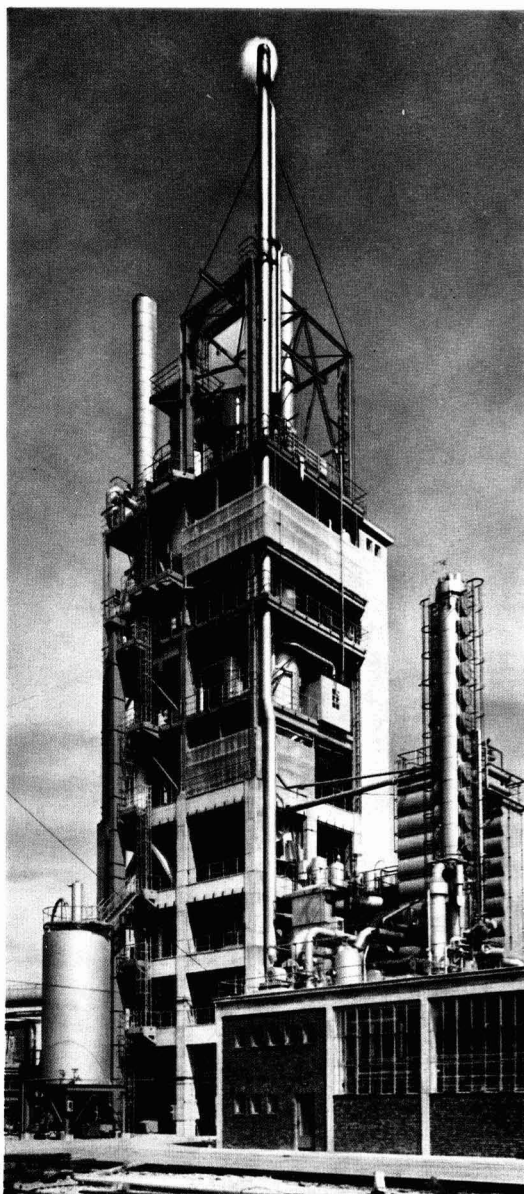
Principle of Process:

The preheated hydrocarbons are injected with superheated steam into a bed of hot sand which is kept in a strongly fluidised motion. The heat transferred from the sand to the hydrocarbons effects cracking into olefins. The coke formed during cracking deposits on the sand particles. This sand is withdrawn continuously, reheated and regenerated by burning off the coke deposits in a pipe lift, and returned to the sand bed.

LURGI GESELLSCHAFT FÜR WÄRMETECHNIK MBH
FRANKFURT (MAIN) - GERMANY

LURGI

Associated Lurgi companies:
Lurgi Apparatebau Gesellschaft mbH
Lurgi Gesellschaft für Chemie u. Hüttenwesen mbH
Lurgi Gesellschaft für Chemotechnik mbH
Lurgi Gesellschaft für Mineralöltechnik mbH



Commercial News

Berry Wiggins

Berry Wiggins and Co. are raising their dividend from 11½% to 12%, with a second interim of 7% for 1961. Preliminary group profits, before tax, are £450,086 (£463,304).

British Oxygen

Chairman of British Oxygen Co. said at the company's annual meeting that it was his view that the Common Market would make very little difference to the company, and might lead to further opportunities. This was in reply to a shareholder who suggested that the company might not be able to meet the challenge.

Groewood Securities

A further increase in profits is expected by Mr. J. P. C. Danny, chairman of Groewood Securities Ltd., barring unforeseen circumstances. Subject to inevitable fluctuations in trading conditions, business in chemicals is capable of further growth. In an analysis of the £204,841 profit before interest, administration expenses and tax, chemical companies contributed £90,679, compared with a forecast of £70,000. This total was below the 1959-60 level. Chemical companies comprise: Bush Beach and Segner Bayley Ltd., Bentham Chemical Ltd., and Godfrey Woodhead and Son Ltd.

I.C.I.

I.C.I. have engaged Morgan Stanley and Co. to advise them in connection with their proposed listing on the New York Stock Exchange.

Revertex

Revertex have announced a dividend of 20%, maintaining a total distribution of 32½% as forecast. Group profit for the year ended 30 September was £282,766 compared with £262,418 for the previous year.

Allied Chemical

Approval of the merger of Union Texas Natural Gas Corporation into Allied Chemical Corporation (see C.A., 2 December, 1961, page 893) was registered by stockholders of the latter at a special meeting, more than 87% of the outstanding shares being voted in favour. The shareholders are to receive seven-eighths of one share of Allied Chemical common stock for each share of Union Texas.

The operations, formerly conducted by Union Texas Natural Gas Corporation, will be continued under the name of Union Texas Petroleum, a division of Allied Chemical.

Celanese Corp.

Celanese Corporation of America are selling their polyester plastics business to Marco Chemical Corporation, a newly-formed concern at Edison, N.J.

- Groewood expect increased profits
- Allied Chemical/U.T.N.G. merger approved
- American Celanese to sell polyester interests
- Ugilor production increased 11% in 1961

Terms of the purchase were not disclosed but financial quarters understood the sale will be made for more than \$1 million in cash.

Celanese polyester plastics volume is understood to be running at slightly less than \$2 million/year, or less than 10% of the company's total plastic sales. Celanese explained that the "sale of this speciality resin business is logical in the light of the extensive diversification of Celanese technology in recent years," which led the company to other, larger volume plastics.

Chemie-Verwaltungs-AG

Chemie-Verwaltungs-AG, Frankfurt-on-Main (partial subsidiary: Chemische Werke Hüls AG), have recommended an unchanged dividend for the past financial year of 12%. The capital on which the full dividend will be paid has risen from DM81,600,000 to DM122,400,000, a dividend of 6% being paid on the DM40,800,000 of new shares issued in 1960. Net profit rose from DM12,470,000 to DM14,350,000.

Korsnas AB

Annual report of Korsnas AB, Gavle, Sweden, shows that production of chlorine and caustic soda in 1960/61 totalled 63,880 tonnes, compared with 50,523 tonnes in 1959/60. Production of sulphite alcohol totalled 9,476,000 litres (5,891,000), while liquid rosin and other by-products output was 12,363 tonnes (3,404). Manufacture of raw and distilled tall oil and turpentine was unchanged.

Du Pont

Du Pont have declared a quarterly dividend of \$1.5 payable on 14 March to shareholders on record on 27 February.

IG Farben in Liquidation

The liquidators of the IG Farbenindustrie in Abwicklung, the in-liquidation form of Germany's former chemical trust, have announced that as from 31 December 1961 the three successor companies—Badische Anilin- und Soda-Fabrik AG, of Ludwigshafen-on-Rhine, Farbenfabriken Bayer AG, of Leverkusen, and Farbwerke Hoechst AG, of Frankfurt-on-Main—were paid a sum of DM12 million as a further instalment payment to meet claims. Some 80% of the companies' capital claims have now been met from the liquidation sum.

Finalens

Soc. Industrielle et Financière de Lens, using coke-oven gas, from Douvrin, Pas-de-Calais, as well as Lacq sulphur, in 1961 produced the following: ammonia, 86,821 tonnes (78,955 tonnes in 1960); Nitraprills (ammonium nitrate fertiliser), 116,592 tonnes (105,185);

ammonium sulphate, 29,123 tonnes (30,091); urea, industrial and agricultural, 26,629 tonnes (25,454); sulphuric acid, 43,660 tonnes (44,238).

After a low level of stocks at the end of 1960, the position returned to normal at the end of 1961 (seven or eight weeks of output). In spite of higher production, the provisional turnover figure, before tax, was NF60.5 million, 11.5 down on 1960, but 6% above the 1959 figure. Finalens, whose offices are at La Bassée, Nord, are 50% controlled by the French National Coal Board.

Francaise des Glycerines

Turnover of Cie Française des Glycérines for 1961 was down 5.47% on 1960 owing to a drop of about 30% in the sales prices of glycerine, which is one of the main activities of this company under control of Nobel-Bozel, and belonging with the latter to the group Centrale de Dynamite. The other main interest of this company is in activated earths (bentonites etc.). Turnover of Nobel-Bozel in 1961 was NF192 million (NF180.5 million), or a rise over the year of 6%.

Naphtachimie

Turnover of Naphtachimie of France in 1961 increased by 7%, while sales were up 33%. Production at Lavera totalled 100,000 tonnes of ethylene and 85,000 tons of propylene.

Pierrefitte Enterprises

Pierrefitte Enterprise, fertiliser manufacturers, propose to increase their capital by a rights issue of 270,480 new shares of F.50 at F.90 to shareholders in the proportion of one to three.

Roussel-Uclaf

Turnover of Roussel-Uclaf for the second half of 1961 increased by 4.5% on the second six months of 1960 which was NF71.24 million.

Ugilor

The French chemical company Ugilor, producers of methyl methacrylate, announce that 1961 production was some 11% higher than in the previous year. Output is expected to increase by a further 25% over the current year. Ugilor are thus to expand their production facilities, to which end the company capital is to be raised from Fr.20 million to Fr.24 million.

Universal Oil

Universal Oil Products are expecting to show substantially better earnings for 1961 compared with 1960. They also expect a further gain in revenue and profits in 1962.

BRITISH CHEMICAL PRICES

GENERAL CHEMICALS

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

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

Alum. Ground, f.o.r., about £25.

MANCHESTER: Ground, £25.

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

MANCHESTER: £16 to £18.

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

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

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

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

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

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

Arsenic. Ex-store, £45 to £50.

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

Barium Chloride. 2-ton lots, £45.

Barium Sulphate [Dry Blanc Fixe]. Precip. 2-ton lots, d/d, £39.

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

Borax. Ton lots, in hessian bags, c.p. Tech. anhydrous, £60 gran., £47 10s; crystal £51; powder, £52; extra fine powder, £53; BP, gran, £56 10s; crystal, £60; powder, £61; extra fine powder, £62. £1 cheaper in 5-ply paper bags.

Boric Acid. Ton lots, in hessian sacks, c.p. Comm., gran., £78 10s; crystal, £87 10s; powder, £85 extra fine powder, £87; BP gran., £91 10s; crystal, £99 10s; powder, £97; extra fine powder, £99. £1 cheaper in paper bags.

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

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

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

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

Citric Acid—Granular. In kegs, 1-4 cwt. lots, per cwt., £7 17s 9d; 5-19 cwt. lots, per cwt., £7 16s 9d; 1-ton lots, per cwt., £7 15s 9d; packed in paper bags, 1-4 cwt. lots, per cwt., £7 10s 9d; 5-19 cwt. lots, per cwt., £7 9s 9d; 1-ton lots, per cwt., £7 8s 9d.

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

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

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

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

Formaldehyde. In casks, d/d, £40.

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

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

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

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

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

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

All prices per ton unless otherwise stated

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

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

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

Lead Acetate. White, about £154.

Lead Nitrate. 1-ton lots, about £135.

Lead, Red. Bases prices: 15-cwt. drum lots, Genuine dry red, £92 5s per ton; orange lead, £104 5s per ton; Ground in oil: red, £114 15s orange, £126 15s.

Lead, White. Bases prices: in 5-cwt. drums, per ton for 2-ton lots, Dry English £106; Ground in oil, £126 10s.

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

Litharge. In 5-cwt. drum lots, £94 5s.

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

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

Magnesium Chloride. Solid (ex-wharf), £19 11s per ton.

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

Magnesium Sulphate. Crystals, £14 15s, ex-works.

Mercuric Chloride. Tech. powder, per lb., for 1-ton lots, in 28-lb. parcels, 19s 5-cwt. lots, in 28-lb. parcels, 19s 6d; 1-cwt. lots, in 28-lb. parcels, 19s 3d.

Mercury Sulphide, Red. Per lb. for 5-cwt. lots in 28-lb. parcels, £110 6d; 1-cwt. lots, in 28-lb. parcels, £1 11s.

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

Nitric Acid. 80° Tw., £35 2s.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Sodium Metaphosphate. Flaked, paper sacks, £136.

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

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

Sodium Nitrite. 4-ton lots, £32.

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

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

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

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

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

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

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

MANCHESTER: d/d station, £10 10s.

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

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

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

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

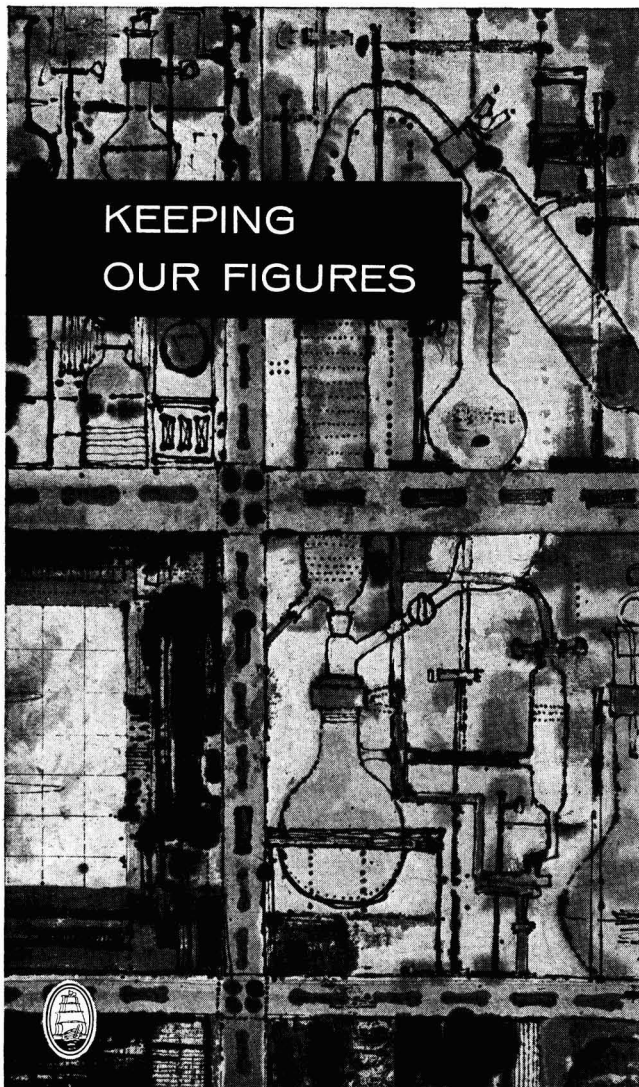
Tartaric Acid—Powder and Granular. Per cwt.: 10 cwt. or more, in kegs, 286s; in bags, 278s per cwt.

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

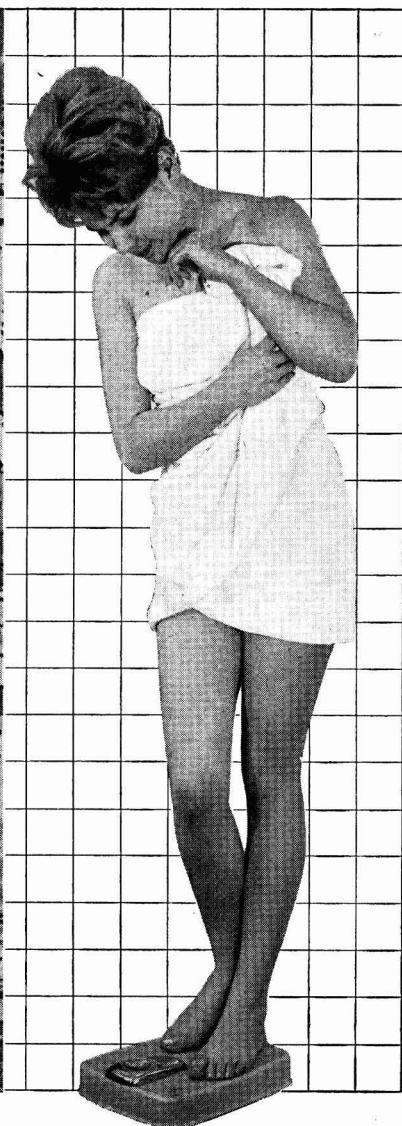
Zinc Oxide. Per ton: white seal, £90; green seal, £88; red seal, £85.

SOLVENTS AND PLASTICISERS

Acetone. All d/d. In 5-gal. drums, £124; in 10-gal. drums, £114; in 40-45 gal. drums, under 1 ton, £89; 1-5 tons, £84;



KEEPING OUR FIGURES



The figures we keep at Bromborough Pool may not be vital statistics but the flow of information which comes from our Laboratory is vital both to us and our customers. Here the most modern analytical techniques and equipment are matched by a fund of knowledge and experience in the highly specialised field of oleochemical research. This laboratory service not only assists in the development and testing of new and improved products, it also serves as a watching eye on product quality during manufacture, ensuring uniform and consistent high performance. Perhaps Price's resources and resourcefulness in oleochemicals could help to solve *your* problem? A technical service team is at your call.

***Indicative of Price's leadership in oleochemicals is the information contained in their technical publication 'The Analysis of Fatty Acids and Fatty Alcohols'. This book contains comprehensive data on the nature of fatty acids and alcohols and analytical procedures.**

PRICE'S (BROMBOROUGH) LTD

OLEOCHEMICALS IN THE SERVICE OF INDUSTRY

BROMBOROUGH POOL · BEBINGTON · WIRRAL · CHESHIRE · Telephone: Rock Ferry 2020 · Telex 62408

5-10 tons, £82; 10 tons and up, £80; in 500-gal. tank wagons, £79. In bulk minimum 2,500 gal. £75 per ton.

Butyl Acetate BSS. 10-ton lots, £155.

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

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

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

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

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

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

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

Diocetyl Phthalate. In drums, 10 tons, d/d, per ton, £222; 45-gal. 1-4 drums, £228.

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

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

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

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

Methanol. Pure synthetic, d/d, £46.

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

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

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

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

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

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

RUBBER CHEMICALS

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

Carbon Black. GPF: Ex-store, Swansea. Min. 3-ton lots, one delivery, 6½d per lb.; min. 1-ton lots and up to 3-ton, one delivery 7d per lb.; ex-store, Manchester, London and Glasgow, 7½d per lb. HAF: ex-store, Swansea; Min. 3-ton lots, one delivery. 7½d per lb.; min. 1-ton lots and up to 3-ton, one delivery, 8d per lb. Ex-store Manchester, London and Glasgow. 8½d per lb. ISAF: Ex-store Swansea, min. 3-ton lots in one delivery, 9½d per lb., min. 1-ton lots and

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

Carbon Tetrachloride. Ton lots, £83 15s.

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

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

Mineral Black. £7 10s-£10.

Sulphur Chloride. British, about £50.

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

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

COAL TAR PRODUCTS

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

Creosote. Home trade, per gal., according to quality, f.o.r. maker's works, 1s-1s 9d. MANCHESTER: Per gal., 1s 3d-1s 8d.

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

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

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

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

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

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

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

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

Xylole. According to grade, in 1,000-gal. lots, d/d London area in bulk, per gal., 5s 4d-5s 6d.

INTERMEDIATES AND DYES

(Prices Normal)

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

o-Cresol 30/31°C. D/d, per lb., 1s.

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

Dichloraniline. Per lb., 4s 6d.

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

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

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

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

Nitronaphthalene. Per lb., 2s 5½d.

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

p-Toluidine. In casks, per lb., 4s 6d.

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

Fourth international aerosol congress

THE Fourth International Aerosol Congress and Exhibition is to be held in the U.K. in 1963, and will be organised by the British Aerosol Manufacturers' Association at the invitation of the Federation of European Aerosol Associations. The congress and exhibition will take place at the Royal Pavilion and Corn Exchange, Brighton during the week beginning 7 October, 1963.

Baywood's odourless systemic insecticide

THE systemic insecticide, Metasystox, will this season be joined by a close relative, to be known as Metasystox R, with twice the potency, it is announced by Baywood Chemicals Ltd., who will market it exclusively in the U.K. The new material, which is in the organophosphorus group, has the same field of action and effectiveness as Metasystox—the control of aphids, red spider mites and certain other insect pests on top fruit, hops, sugar beet, potatoes and beans. Its outstanding feature is that it is odourless when sprayed.

Chemically, the active ingredient of Metasystox R is closely related to demeton-methyl (the active ingredient of Metasystox). In fact it is the active compound produced by the systemic action of Metasystox within the plant, and was discovered during extensive field trials with Metasystox.

Baywood underline that Metasystox R will persist in the plant up to 14 days, and that the spray operator needs no protective clothing.

New film on Epok resin paints

THE story of the development of resins which are soluble in water and which eliminate the need for expensive and potentially dangerous flammable solvents is told in a new film produced by British Resin Products Ltd., called 'Thinners on tap.'

The problem of developing Epok resin water soluble paints was to create a resin which would be temporarily soluble in water but which would become insoluble again on being stoved. The film shows the steps towards this goal.

The new film runs for 15 mins. and can be screened on any ratio from wide-screen 1.85 to 1 to full frame. It is available on free loan from Distillers Plastics Group Film Library.

Market Reports

Better enquiry for farm chemicals

LONDON Conditions show little change with home trade demand maintained at about the recent level. New business for shipment continues to make a satisfactory showing in competitive conditions and enquiries have covered a wide range of materials. Price movements have been within narrow limits and the undertone is steady. A better enquiry is reported for agricultural chemicals.

There is again no notable change in the coal tar products market.

SCOTLAND Home trade buying has been fairly regular with quantities showing little change and a reasonable off-take against contract requirements. There has been some increased activity both in demands and forward bookings for agricultural chemicals. Although there is still room for improvement in the overseas market there were a number of enquiries with some business resulting.

Serving the World's Industries

specialists

in

the

production

of

Fluorine Compounds

SHEFFIELD

& SON LTD.,

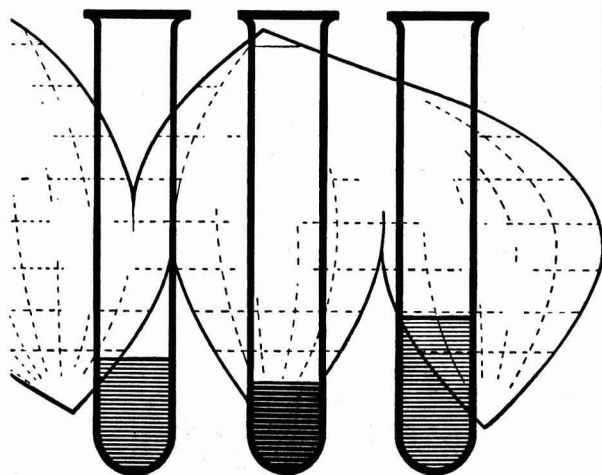
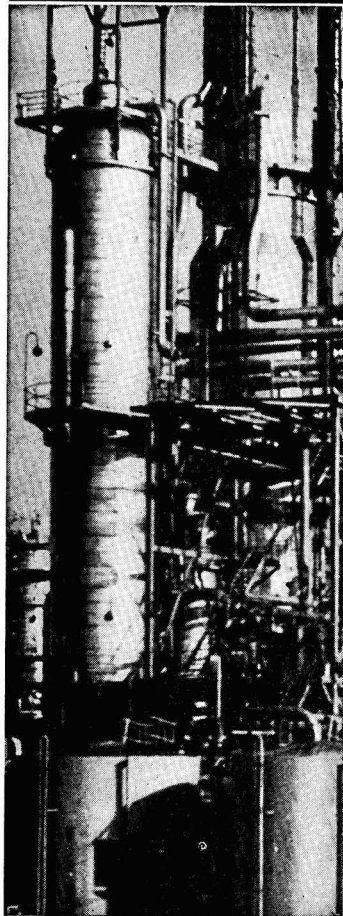
Hydrofluoric Acids

WILKINSON

Analytical Reagent Acids

JAMES

**INDUSTRIAL
WILKINSON
CHEMICALS**



A MEMBER OF
THE LAPORTE GROUP
OF COMPANIES

JAMES WILKINSON & SON LTD.
Eastgate House, 10 Eastgate LEEDS 2
Telegrams: Laporte Leeds. Telephone: 32171

LONDON AGENTS & DISTRIBUTORS
JOSEPH WEIL & SON LTD., FRIARS HOUSE,
39-41 New Broad Street, London, E.C.2

MIDLANDS AREA OFFICE,
153 Parker Drive, Leicester.
Telephone: Leicester 63861



NEW PATENTS

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

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

ACCEPTANCES

Open to public inspection 21 March

Production of copolymers containing hydroxy groups. *Chemische Werke Hüls AG.* 891 925
Stabilised formaldehyde polymers and method for preparing them. *Soc. Italiana Resine.* 892 178

Removal of free chlorine from HCl. *Columbia-Southern Chemical Corp.* 742 037

Hydrocatalytic desulphurisation of petroleum hydrocarbons. *British Petroleum Co. Ltd.* 801 385

Phytotoxic and insecticidal preparations and compounds. *N.V. Philips' Gloeilampen-Fabrieken.* 818 437

Open to public inspection 28 March

Production of rubber latex. *Natural Rubber Producers' Research Association (Taysum, D. H.).* 892 311

Preparation of liquid hydrogen. *British Oxygen Co. Ltd.* 892 601

Phytotoxic and insecticidal triazino compounds and preparations thereof. *Philips' Gloeilampenfabrieken N.V.* 892 421

Process for the modification of polyamide fibrous materials. *Imperial Chemical Industries Ltd.* 892 379

Block copolymers and their production. *Union Carbide Corp.* 892 819

Production of alpha.alpha.-dichloropropionic acid. *British Celanese Ltd.* 892 584

Carbolines and process for their manufacture. *Ciba Ltd.* 892 618

Fibre-forming compositions. *Montecatini.* 892 417

Steroid esters and pharmaceutical preparations containing them. *Ciba Ltd.* 892 742

Cyclopentanophenanthrene derivatives. *Syntex S.A.* 892 620

Process for the preparation of aliphatic peracids. *Celanese Corp. of America.* 892 631

Silicon carbon bodies. *Carborundum Co.* 892 340

Adhesives. *Commonwealth Engineering Co. of Ohio.* 892 633

Amidation products of oxidation products of paraffin hydrocarbons and process for their manufacture. *Farbwerke Hoechst AG.* 892 822

Production of unsaturated polyesters. *Chemische Werke Hüls AG.* 892 718

Production of aromatic acids. *Standard Oil Co.* 892 766

Method and apparatus for stretching films of thermoplastic materials. *Montecatini.* 892 490

Manufacture of a 12-hydroxy-steroid. *Schering AG.* 892 589

Preparation of compounds of the tetracycline series. *American Cyanamid Co.* 892 590

1:3:4-Oxadiazoles and process for their manufacture. *Ciba Ltd.* 892 767

Rubber containing compositions and method of preparation thereof. *Dow Chemical Co.* 892 345

Process for the preparation of endrin. *Shell Internationale Research Maatschappij N.V.* 892 592

Preparation of ethylene oxide and catalyst therefor. *Dynamit Nobel AG.* 892 381

Antraquinone vat dyestuffs and process for their manufacture. *Ciba Ltd.* 892 382

Process for the mass coloration of cellulose acetate materials. *Sandoz Ltd.* 892 384

Organic phosphorus compounds, and their manufacture and use. *Ciba Ltd.* 892 405

Process for preparing LC(+)-3:5-diiodothyronine. *Farbwerke Hoechst AG.* 892 773

Process for the manufacture of azo dyes. *Imperial Chemical Industries Ltd.* 892 323

Biologically active compositions. *Diamond Alkali Co.* 892 406

Process and apparatus for continuously determining end point. *Technical Oil Tool Corp.* 892 407

Phosphorus nitrilo compounds. *Imperial Chemical Industries Ltd.* 892 775

Manufacture of foamed polymeric materials. *Imperial Chemical Industries Ltd.* 892 776

Gibberellins. *Imperial Chemical Industries Ltd.* 892 777

Synthetic resin laminates. *Bakelite Ltd.* 892 778

Unsaturated thiophosphoric acid esters and pesticidal compositions containing them. *Ciba Ltd.* 892 326

Production of alkanols. *Distillers Co. Ltd.* 892 723

Pharmaceutical compositions comprising ethylthiocarbonyl compounds. *Imperial Chemical Industries Ltd.* 892 450

Catalyst and method for the dehydrogenation of ethylbenzene. *Dow Chemical Co.* 892 779

Production of normal butyl bromide. *Distillers Co. Ltd.* 892 329

Synthetic resins. *Röhm & Haas GmbH.* 892 458

Xylene separation. *California Research Corp.* 892 330

Process for the production of high-polymeric alkyl and aryl-siloxanes. *Farbenfabriken Bayer AG.* 892 782

Recovery of high purity isoprene from a hydrocarbon fraction containing acetylenes. *Esso Research & Engineering Co.* 892 470

Process for the manufacture of methionine. *Inventa AG für Forschung und Patentverwertung.* 892 755

Process for the production of spinnable polyethylene terephthalate from polyethylene terephthalate waste. *Vereinigte Glanzstoff-Fabriken AG.* 892 437

Pharmaceutical compositions comprising 3-pyridine acetic acid. *Lepetit S.p.A.* 892 784

Production of epsilon-caprolactam. *Union Carbide Corp.* 892 785

Vat dyestuffs of the 4-amino-antraquinone-2,1-(N)¹,2^(N)-benzenecaridone series. *Badische Anilin- & Soda-Fabrik AG.* 892 402
Catalyst, its preparation and its use for the production of maleic acid and maleic anhydride. *Badische Anilin- & Soda-Fabrik AG.* 892 371
Crystalline copolymers and process for preparing them. *Montecatini, and Zeigler, K.* 892 356

Process and apparatus for producing carbon black. *United Carbon Co. Inc.* 892 731

Process for conditioning dioxazine pigments. *Ciba Ltd.* 892 733

Resinous coating compositions. *Pittsburgh Plate Glass Co.* 892 734

Chlorinated copper phthalocyanine. *Interchemical Corp.* 892 735

Production of steroids and the compounds thus produced. *Laboratoires Francais de Chimiotherapie.* 892 440

Production of dialkyl sulphides. *Farbenfabriken Bayer AG.* 892 738

Anti-foaming agents. *Dow Corning Corp.* 892 787

Process for the preparation of organic sulphohalides. *Boehme Fettchemie GmbH.* 892 788

4-Methoxy-2-methyl-6-sulphanilamidopyrimidine and a process for the preparation thereof. *Tanabe Seiyaku Co. Ltd.* 892 789

Process for the production of urea having a low water and biuret content. *Lonza Electric Chemical Works Ltd.* 892 360

Production of hexamethylene diamine adipate. *Zimmer, J. H. [trading as Zimmer Verfahrenstechnik, Hans J.].* 892 564

Process for the manufacture of methyl isothiocyanate. *Schering AG.* 892 790

Epoxidation process and product. *Hercules Powder Co.* 892 361

Process for the production of 2-hydrazino-3-mercapto-quinoxaline. *Farbenfabriken Bayer AG.* 892 758

Production of liquid oligomers of 1,3-dienes. *Badische Anilin- & Soda-Fabrik AG.* 892 759

Sulphonamide derivatives. *Farbenfabriken Bayer AG.* 892 760

Process for the manufacture of coupling components for azo-dyesuffs. *Ciba Ltd.* 892 706

AMENDED SPECIFICATIONS

Derivatives of purine. *Wellcome Foundation Ltd.* 759 316

Phthalic acids and formic acid. *Mid-Century Corp.* 818 302

Catalytic oxidation of non-aromatic compounds. *Scientific Design Co. Inc.* 875 531

Chemical engineering congress for London

THE third congress of the European Federation of Chemical Engineering is to be held at Olympia, London, on 20 to 29 June, 1962. This is the first time the congress has been held in the U.K.

The technical programme will fall into four parts. The fundamental aspects of the subjects discussed will be given adequate attention but recent developments will be given the prominent place. The presentation of the papers and the discussions will be simultaneously translated into French, German and English.

The programme has been arranged as follows: **Interaction between fluids and particles**—Sedimentation and motion of single particles, The flow suspensions, The mechanics of fluidised systems, Flow through fixed beds, Heat and mass transfer, Separation of particles and fluids; **The handling of solids**; **Process optimisation**; **the physics and chemistry of high pressures**—Intermolecular forces and thermodynamic properties, Apparatus for high pressures, The properties of matter at very high pressures, Chemical reactions at high pressures.

Further information may be obtained from the Congress Secretary, The Institu-

tion of Chemical Engineers, 16 Belgrave Square, London, S.W.1.

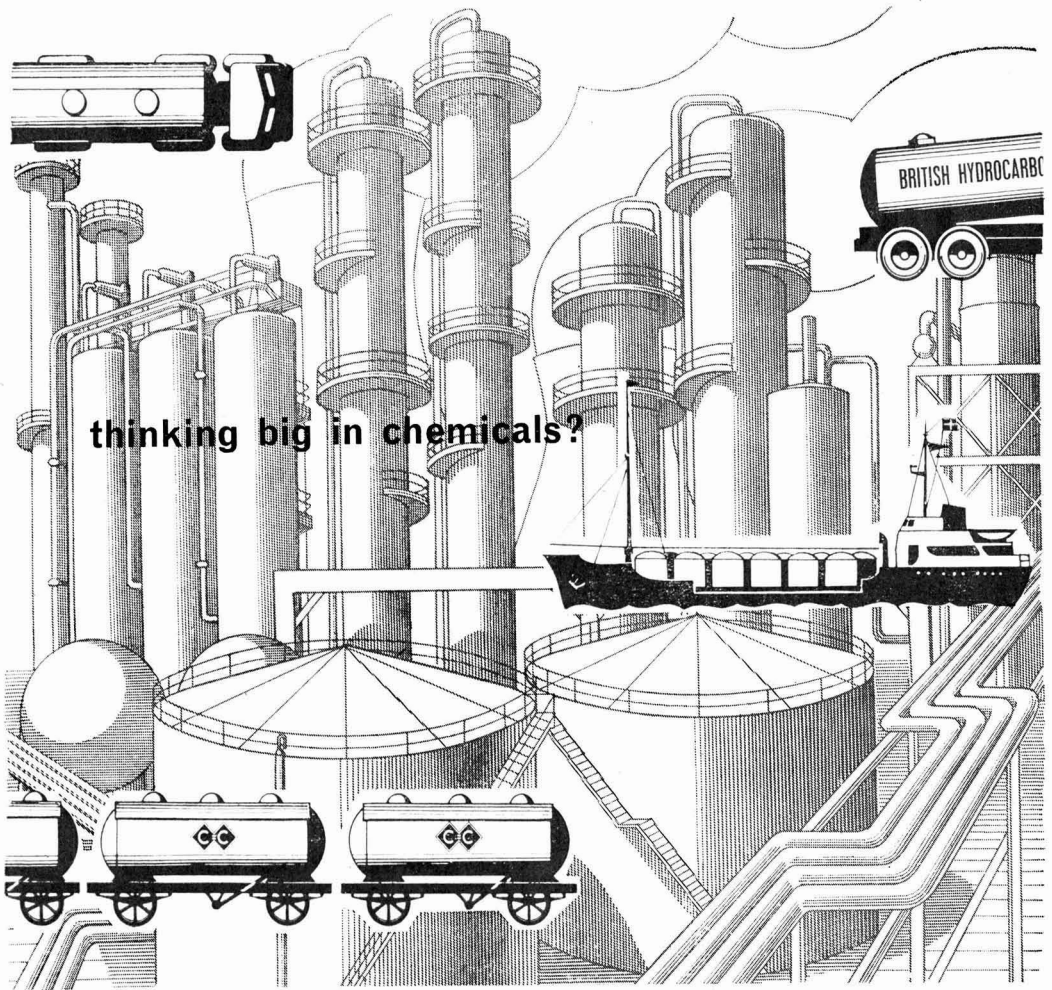
British Sulphur start new PK, journal

THIRD in the series of international journals published by the British Sulphur Corporation Ltd., 43 Great Marlborough Street, London W.1, will begin quarterly publication in March under the title *Phosphorus and Potassium*. Like its predecessors (*Sulphur*, started in 1953, and *Nitrogen*, started in 1959), it will have a marketing and technical content.

The corporation have also recently, started the publication of *NPK and Fertilizer Abstracts Bulletin* on a monthly basis, to supplement their journals. Subscription rates will be £5/year to subscribers of any of the journals and £10 to non-subscribers.

Trade notes

This week our regular features 'Trade Notes' and 'Diary Dates' appear in page 340.



thinking big in chemicals?

However big you may think in chemicals, DCL's and BHC's productive capacity can match it. British Hydrocarbon Chemicals now produce at the rate of 250,000 tons of chemicals a year. DCL are proud to act as sales agents for BHC and include these chemicals with their own quality-tested products and can ensure a fast and dependable delivery service by road, rail or sea.

- ACETONE
- BUTADIENE
- CUMENE
- CUMENE HYDROPEROXIDE
- ETHANOL
- ETHYLENE DICHLORIDE
- ISOPROPANOL
- PHENOL



A Trade Mark of British Hydrocarbon Chemicals Limited.



THE DISTILLERS COMPANY LIMITED • CHEMICAL DIVISION

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

Telephone: MAYfair 8867



LIQUIDS IN BULK

We are specialists in the bulk transport of the following

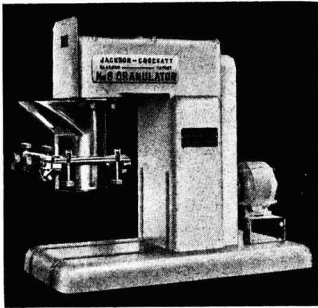
ACIDS • CHEMICALS • ALKALIS
 SOLVENTS • CAUSTICS • EMULSIONS
 PETROLEUM • PRODUCTS

Continental Enquiries Welcomed

MONKTON MOTORS LTD.

WALLINGFORD ROAD, UXBRIDGE, MIDDX.

Telephone : UXBRIDGE 35574/5



No. 6
 RECIPROCATING
 TYPE

LABORATORY OR BENCH GRANULATOR

NEW & IMPROVED DESIGN FOR
 GRANULATING DAMP & DRY MATERIALS

- **QUIET IN OPERATION**
 All gearing is enclosed in oil bath—no grease nipples or other external lubrication required.
- **ROBUST & DURABLE**
 Stainless Steel Parts where in contact with the material being granulated. The guaranteed long life of the mesh is another important feature.
- **EFFICIENT, DEPENDABLE,
 EASILY CLEANED**
 All parts working on the material being granulated can be easily and quickly dismantled for thorough washing without the use of spanners.

Self Contained Electric Motor Drive

Net Weight: 2 Cwts. Gross Weight: 3½ Cwts. Overall
 Height: 2' 6".

J. G. JACKSON & CROCKATT, LTD.
 NITSHILL ROAD, THORNIEBANK, GLASGOW

Tel: Giffnock 0391

Grams: "JAKCRO THORNIEBANK"

CROMIL & PIERCY LTD.



GRAPHITE
 IN ALL FORMS

MILBURN HOUSE
 "E" FLOOR

NEWCASTLE-ON-TYNE

Tel: 2-7761

CLASSIFIED ADVERTISEMENTS

CLASSIFIED RATES: All sections 5d. per word. Minimum 8/- . Three or more insertions 4d. per word. Box Number 2/- extra.

SEMI-DISPLAY: 30/- per inch. Three or more insertions 25/- per inch.

EDUCATIONAL

CHEMICAL ENGINEERING. Guaranteed Home Study Courses for A.M.I.Chem.E. exam. The highest percentage of successful candidates—up to one third in consecutive years—have been trained by T.I.G.B. Everyone seeking promotion in the Chemical and Allied Industries should send for the T.I.G.B. "Guide to Success". 100 pages of expert advice and details of wide range of guaranteed (Exam and Diploma) Courses, including A.M.I.Mech.E., A.M.I.Prod.E., B.Sc.(Eng.). Courses in individual subjects also available. Send for your copy today—FREE. T.I.G.B. (Dept. 84), 29 Wright's Lane, London, W.8.

FOR SALE

18 Horizontal steel rivetted pressure vessels 6 ft. 11 in. by 5 ft. 6 in. dia., 70 p.s.i. w.p., numerous connections, suitable air receivers, other duties.

George Cohen Sons & Co. Ltd.,
600 Wood Lane,
Shepherds Bush, W.12
Tel.: Shepherds Bush 2070

George Cohen Sons & Co. Ltd.,
Trinity Road, Kingsbury,
Nr. Tamworth, Staffs.
Tel.: Hurley 281/2

ALUMINIUM TUBES IMMEDIATE DELIVERY FOR SALE

Approx. 1,200 feet 8 in. bore Aluminium Tubes in 24/24 foot lengths. Also 88 Aluminium Flanges to suit (Unused).

Maden & McKee Ltd.,
317, Prescott Road, Liverpool, 13

- 10 Rivetted Steel Dish-Ended Cylindrical Tanks, 15' x 6' 6" x 1/2", 3,000 galls capacity. Price: £80 stg., each.
- 8 Welded Steel Rectangular Tanks, 5' x 5' open flanged top with steel covers. 800 galls capacity. Price: £25 stg., each.
- 1 "Royles" Calorifier, 9 million B.T.U. Vertical, Copper Tubes. Price: £120 stg.

ABERCROMBIE & CO., LTD.
18 Craigmait Drive, Glasgow, N.W.

MISCELLANEOUS

Chemical Manufacturers in S.W. Lancs have materials to be ground on sub-contract basis. Please forward details of equipment and capacity available to Box No. 3779.

PLANT AND MACHINERY FOR SALE

Baker-Perkins Class BB "Double Nabes" Bladed Steam Jacketed Mixers. Four—size 12 and Three—size 11, of 20 and 8 gallons respectively.

Oil Jacketed Double Trough Mixer 48 in. by 36 in. by 29 in. deep. Paddle Blades. Bottom Outlets.

Barron 'U' Sifter Mixer 96 in. by 33 in. by 33 in. with 10 H.P. A.C. Motor.

Gardner 'U' Sifter-Mixers 66 in. by 24 in. by 24 in. with 5 H.P. A.C. Motors. Four available, of modern streamlined design.

Horizontal 'U' Trough Mixers 48 in. by 18 in. by 22 in. Three—Tilting type, Paddle Blades. Glanded.

Over-Arm Twin-Blade, Tilting, 30 gallon Mixers with 3 H.P. Geared Motors. Five available.

Lying at our No. 2 Depot, Willow Tree Works, Swallowfield, Berkshire.

Apply: Winkworth Machinery Limited, 65 High Street, Staines, Middlesex. Telephone 55951.

SITUATIONS VACANT

Senior Sales Executive responsible to Managing Director required for sales development work in organic chemicals. Applicants should have a technical qualification in chemistry or chemical technology and some knowledge and experience of the process industries. The Company manufactures organic chemicals in the North Manchester area for a wide range of industries and is a subsidiary of a large group. Commencing salary £1,500-£2,000 per annum (depending on qualification and experience) and non-contributory pension arrangement. Apply Managing Director, Box No. 3778.

FOOD RESEARCH ANALYST

Scientific Officer, male, graduate or A.R.I.C., required for Analytical Laboratory. Duties will include research into analytical methods and the investigation of a wide range of problems associated with the baking industry. Experience of food analysis an advantage. This is a responsible post in a vigorous organisation. Pensionable under F.S.S.U.

Applications should include details of age, qualifications, experience and names of two referees. Write to:

The Director of Research,
British Baking Industries Research Association,
Chorleywood,
Rickmansworth, Herts.

TRADE NOTES

Uses of nylon

Uses of nylon ranging from protective clothing to Dracone oil barges, and including valve diaphragms and seals for storage tanks containing highly volatile liquids, are included in a new illustrated booklet, "Under cover with nylon," available from British Nylon Spinners Ltd., Industrial Sales Section, 69 Knightsbridge, London S.W.1.

Epoxy-silicone resin

Under their exclusive marketing agreement with Emerson and Cuming, U.S., the Electronics Division of Microcell Ltd., a subsidiary of BTR Industries Limited, is now offering in the U.K. a new epoxy-silicone resin, type 4712. This is claimed to possess the adhesive properties of epoxies as well as the resiliency of silicone rubber.

High polymers

A new eight-page brochure called "High polymers" is available from Product News Section, Allied Chemical International, 40 Rector Street, New York, 6, N.Y. The booklet details the progress made in polymer chemistry giving special emphasis to polythene research and crystalline polymers.

Melmex prices cut

B.I.P. Chemicals Ltd., Oldbury, are to cut U.K. prices of Melmex granular and fine moulding powders for the plastics industry by 3d/lb from 1 March.

Rust Remover

A thixotropic chemical rust remover called Rustrem has been introduced by

Stewart Wales, Somerville Ltd. of Glenburn Road, College Milton Estate, East Kilbride. Application is by brushing and the delay period is stated to vary from a few minutes to 24 hr., depending on the extent of rusting.

Water-soluble primer resin

A new water-soluble primer resin, Epok W1760, announced by British Resin Products Ltd., Devonshire House, Piccadilly, London W.1, is claimed to give water thinnable primer paints of a higher performance at a lower cost than has previously been possible. It is stated to have a higher corrosion resistance and better dispersion properties.

Industrial adhesive

Very great adhesive properties, outstanding chemical resistance and a wide range of applications are claimed for a new cold filler, Formula RB 373, which is supplied in two portions, a fluid and a powder, so blended that careful measurement of them is not necessary, thus low viscosity or almost solid paste can be formed to suit the particular job in hand. It can be used in metals, wood and plastic. Further details are available from Rowan and Boden Ltd., Special Products Division, 131/137 Renfrew Road, Paisley, Renfrewshire.

R.I.C.—Brighton: Tech. Coll., 6.30 p.m. 'The chemistry & application of silicones' by H. S. B. Marshall.

S.C.I.—Glasgow: Royal Coll. of Science & Tech., 7 p.m. A.g.m.

S.C.I.—London: 14, Belgrave Sq., S.W.1, 6.30 p.m. 'Polypeptides in relation to medical research' by Prof. H. N. Raydon.

S.C.I.—Manchester: Literary & Philosophical Soc., 36, George St., 6.30 p.m. 'H₂S removal by the Streftford liquid purification process' by Dr. B. H. Holland & Dr. R. Williamson.

DIARY DATES

MONDAY 26 FEBRUARY

C.S.—Durham: Science Labs., Univ., 5 p.m. 'Some organo-transition metal complexes' by Dr. M. L. H. Green.

I.R.I.—Manchester 2: Engineers' Club, Albert Sq., 6.45 p.m. 'Analysis of the rubber industry in the 1960's' by F. C. J. Poulton.

S.C.I.—Leeds: Mouldsworth School of App. Sci., 6.45 p.m. A.g.m., 7 p.m. 'The organisation of research & development' by Dr. F. Roffey.

TUESDAY 27 FEBRUARY

C.S.—Manchester: Room Fl, Coll. of Sci. & Tech., 4.30 p.m. 'Use of radioisotopes in study of surface films' by Prof. N. K. Adam.

Inst. Chem. E.—Swansea: Assembly Room, Univ. Coll., 7.15 p.m. 'Chemical Engineering at Warren Spring Laboratory of D.S.I.R.' by W. Smith.

Inst. Pack.—Liverpool 2: Strand Hotel, Brunswick St., 6.30 p.m. 'Pressurized packaging—aerosols' by A. Herzka.

S.A.C.—London: School of Pharmacy, 29-39, Brunswick Sq., W.C.1, 6.15 p.m. 'Some surface effects in electroanalytical chemistry' by Prof. H. A. Latinen.

WEDNESDAY 28 FEBRUARY

S.C.I.—Falkirk: Lea Park Rooms, 7.30 p.m. 'The Lurgi pressure gasification process' by D. C. Elgin & T. Latta.

S.C.I.—London: Borough Poly., Borough Rd., S.E.1, 2.30 p.m. 'Microbiological standards of raw materials for processed foods'.

Soc. Inst. Tech.—Manson Hse., Portland Pl., W.1, 6.30 p.m. 'On-line computers for process control' by F. Roth.

THURSDAY 1 MARCH

C.S.—Leeds: Chem. Lec. Theatre, Univ., 6.30 p.m. 'Stereospecific polymerisation' by Prof. C. E. H. Bawn.

Pharm. Soc.—Manchester 13: Univ., 8 p.m. 'Insulins & insulin substitutes' by Dr. D. Longson.

S.C.I.—Bristol 8: Univ. Chem. Dept., 6.30 p.m. 'Fuel technology in the U.S.S.R.' by Dr. W. Idris Jones.

S.C.I.—London: 14, Belgrave Sq., S.W.1, 4.30 p.m. 'Polymer science & the research associations' by Dr. K. W. Pepper, Dr. L. Valentine & Dr. W. F. Watson.

S.C.I.—London: West Ham Coll. of Tech., Romford Rd., Stratford, E.1, 7 p.m. 'Crystallisation as an industrial process' by Prof. J. W. Mullin.

FRIDAY 2 MARCH

C.S.—Birmingham: Chem. Dept., Univ., 4.30 p.m. 'Phytol—the Cinderella of natural products' by Prof. B. C. L. Weedon.

C.S.—Cambridge: Univ. Chem. Lab., Lensfield Rd., 8.30 p.m. 'Molecular shapes & sizes' by Dr. L. E. Sutton.

Plas. Inst.—Manchester 3: Textile Inst., 10, Blackfriars St., 6.45 p.m. 'The role of the consultant designer' by J. D. Cochrane.

WORK WANTED & OFFERED

PULVERISING of every description of chemical and other materials. Collections, storage, deliveries. THOMAS HILL-JONES, LIMITED, INVICTA WORKS, BOW COMMON LANE, LONDON, E.3. (TELEPHONE: EAST 3285.)

CRUSHING, GRINDING, MIXING and DRYING for the trade THE CRACK PULVERISING MILLS LTD.

Plantation House,
Mincing Lane,
London, E.C.2.



**LEIGH
& SONS
METAL
WORKS**
Orlando
St., BOLTON

**CARBOYS · PACKED CARBOYS
CARBOY TILTERS AND BARROWS
SAFETY CRATES TOP PROTECTORS**

Decolorising CARBON

ALL GRADES
FOR
ALL TRADES

HIGHEST EFFICIENCY
LOWEST PRICES

Granular Carbon for Solvent Recovery
Regeneration of Spent Carbon

Write for samples and quotations.

FARNELL CARBONS

A DIVISION OF FORESTAL INDUSTRIES (U.K.) LTD.
CONDUIT ROAD, PLUMSTEAD, LONDON, S.E.18

Telephone:
Woolwich 1158 (2 lines)

Telegram:
Socfar, Wal, London

Chemical Age Enquiry Service

For fuller details of equipment, apparatus, chemicals etc., in the advertisement or editorial pages of Chemical Age, fill in the coupons below, ONE PER ENQUIRY, and return to us.

<p><i>Please send further details about</i></p> <p>.....</p> <p>.....</p> <p><i>mentioned on page</i> <i>of this issue.</i></p> <p><i>Name</i>..... <i>Position</i>.....</p> <p><i>Firm</i>.....</p> <p><i>Address</i></p> <p>.....</p> <p>Chemical Age Enquiry Service.</p>
<p><i>Please send further details about</i></p> <p>.....</p> <p>.....</p> <p><i>mentioned on page</i> <i>of this issue.</i></p> <p><i>Name</i>..... <i>Position</i>.....</p> <p><i>Firm</i>.....</p> <p><i>Address</i></p> <p>.....</p> <p>Chemical Age Enquiry Service.</p>
<p><i>Please send further details about</i></p> <p>.....</p> <p>.....</p> <p><i>mentioned on page</i> <i>of this issue.</i></p> <p><i>Name</i>..... <i>Position</i>.....</p> <p><i>Firm</i>.....</p> <p><i>Address</i></p> <p>.....</p> <p>Chemical Age Enquiry Service.</p>

★ *Detach this page complete then fold as marked overleaf to use the post-paid reply folder*

Chemical Age

ENQUIRY SERVICE



☐ This is a special service for readers of

CHEMICAL AGE

☐ It is designed to give fuller information on equipment, apparatus, chemicals etc., mentioned in this issue—whether in the editorial text or in an advertisement

☐ Cut out the whole of this page, fold as instructed with post-paid address on the outside



Chemical Age

154 Fleet Street, London, E.C.4

Tel.: Fleet Street 3212

2nd FOLD

Postage will be paid by the Licensee

No Postage Stamp necessary if posted in Great Britain or Northern Ireland

BUSINESS REPLY FOLDER
Licence No. 2501

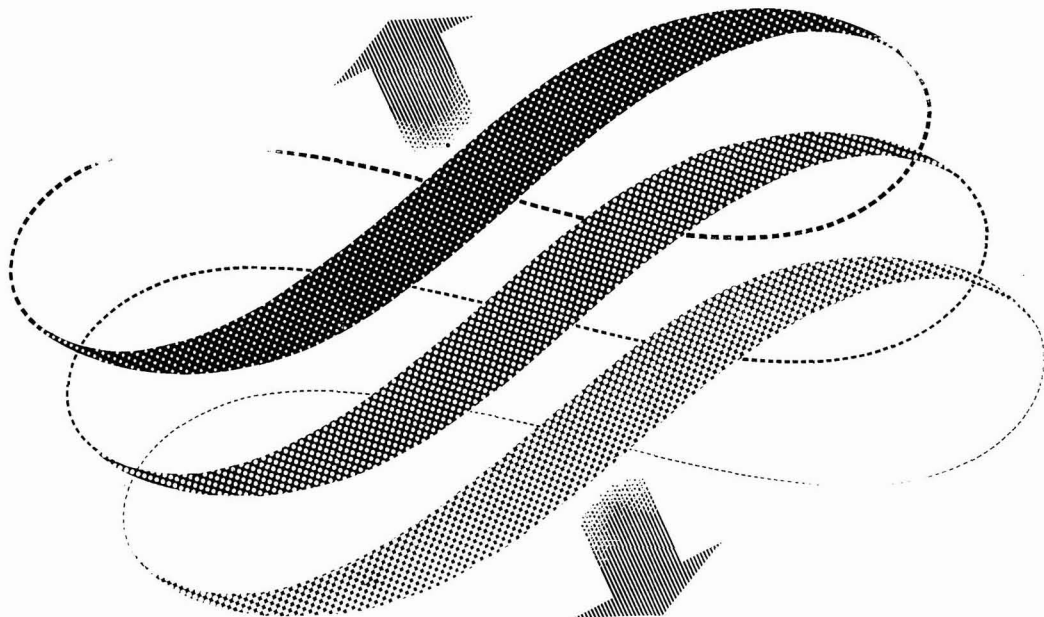
CHEMICAL AGE
154-160 FLEET STREET
LONDON, E.C.4

1st FOLD

3rd FOLD

CUT ALONG THIS DOTTED LINE

NEW from the world's largest separation engineering company



THE SHARPLES-KASON VIBROSCREEN

SHARPLES BRINGS SCIENCE TO SCREENING.

Sharples are known all over the world for their application of process know-how to centrifugal separation problems. Now Sharples bring *science to screening* with the SHARPLES-KASON VIBROSCREEN. This high efficiency high capacity self cleaning vibrating screen separator with its controlled multiplane motion can solve some of the most difficult classifying, separating and dewatering problems. See how it can help you.

SOLIDS CLASSIFICATION.

It can be used for dry separation on a basis of particle size to yield from 2 to 5 fractions.

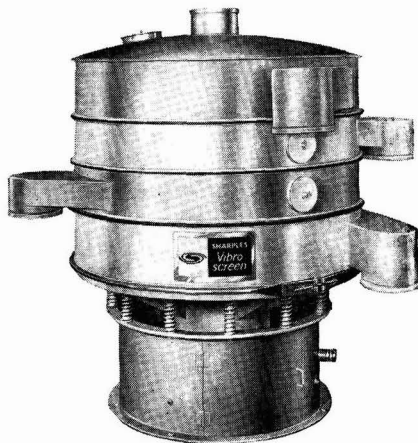
LIQUID-SOLID SEPARATION.

The Sharples-Kason gives liquid-solid separation and high volume dewatering on coarse and fine solids down to 325 mesh.

CHEMICAL ENGINEERING SERVICE.

Sharples have the process know-how to offer a complete chemical engineering service on the application of the Vibroscreen to separation problems.

Experience across the full range of separation equipment, backed by complete pilot plant facilities at our Camberley headquarters, is your best guarantee of the right answer to your problem. Simply fill in the coupon below for further facts about the Sharples-Kason Vibroscreen.



SHARPLES

CENTRIFUGES LIMITED



Tower Works, Doman Road, Camberley, Surrey.
Telephone: Camberley 2601.
Telegrams: Superspin Camberley.

TO SHARPLES CENTRIFUGES LTD.,

Tower Works, Doman Road, Camberley, Surrey. CA

I would like you to

- Send me a bulletin about the Sharples-Kason Vibroscreen.
- Arrange for your representative to call on me.
- Arrange for a demonstration at our works.
- Make an examination of a sample of our products at the Sharples Works.

Please tick relevant square or squares

NAME

ADDRESS

CORROSION



can't live with ...

Mac Bond

... and that's the testimony of those companies who have extended the life and efficiency of their plants by using the Mac-Bond Lining and Covering Service.

and if

Corrosive Liquids or Abrasive Materials are taking their toll of Tanks, Pump Bodies, Valve Casings, Filters, Drums, Pipe Lines or other metal components, in your organization, you can be sure that

MacBOND LINING AND COVERING SERVICE

provides Complete Protection—Always ... and the job can be done either in your factory or at Glasgow.

ON SITE SERVICE:

Urgent repairs or complete linings and coverings are carried out on site when size or other limiting factors prevent the work being transported.

MATERIALS USED:

Soft or hard natural rubber or synthetics. **MACONITE** site vulcanising ebonite qualities to suit various working conditions and to withstand temperatures up to 250° F.



Two large storage tanks, fabricated and rubber-lined for acid manufacture by the MacLellan Chemical Plant Division.

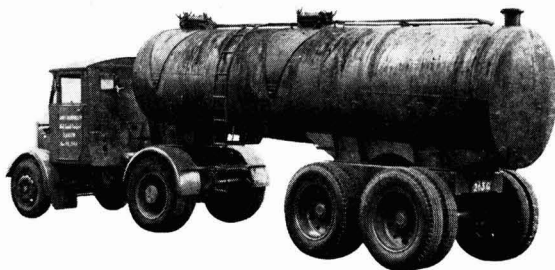
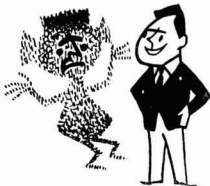


Illustration (by courtesy of James Hemphill Ltd.) shows 10-ton Road Tanker, lined with MAC-BOND Rubber to resist the action of phosphoric acid.

*MacLellan
Rubber*



LONDON:

Burston Road, Putney, S.W. 15. Tel: PUTney 5678

BELFAST:

North Queen Street. Tel: Belfast 22822

Telephone: Maryhill 5111/9

NEWCASTLE UPON TYNE:

Tel: Newcastle 813655

Technical Representation throughout the United Kingdom.