Chemical Age

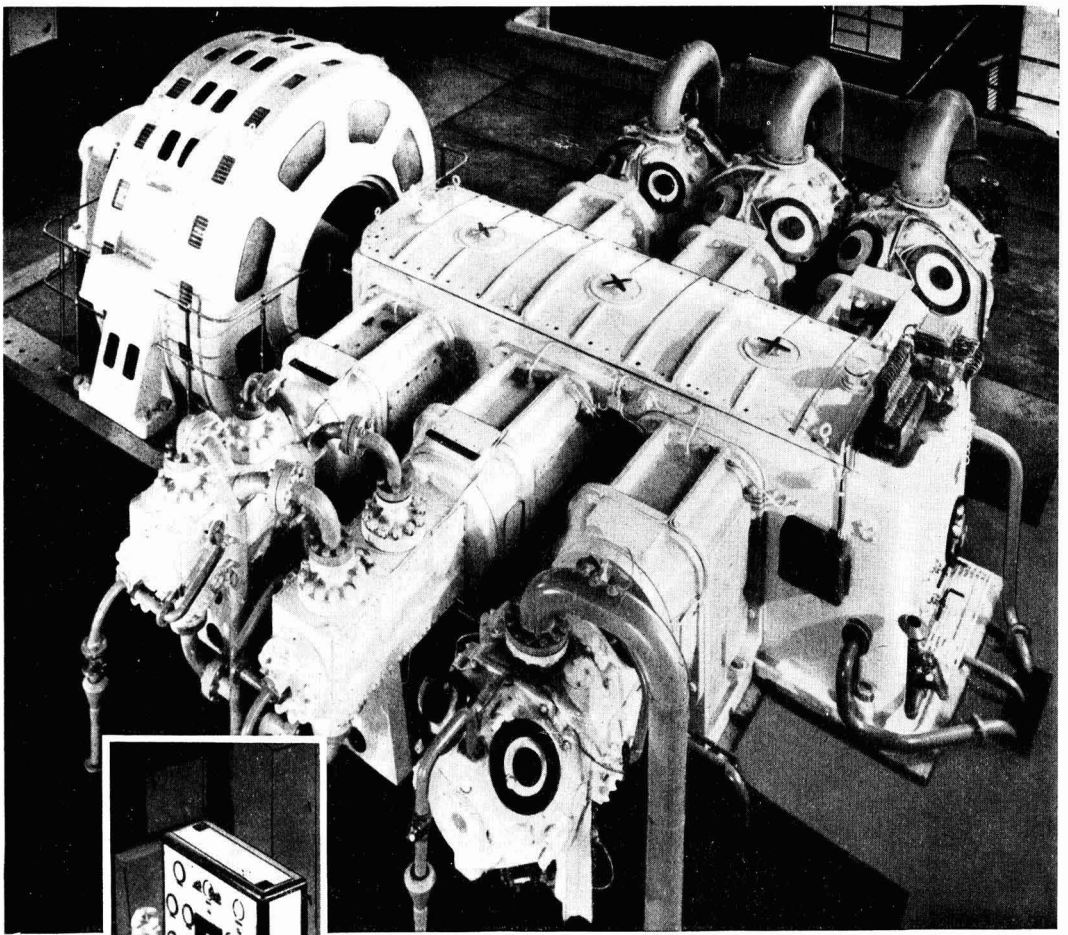
Trade with Russia is A.B.C.M. Dinner Topic

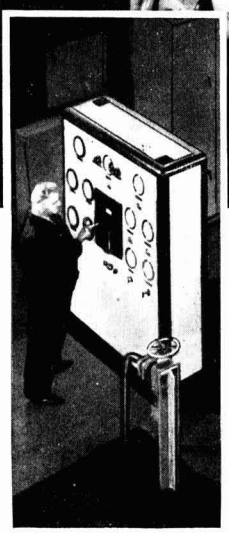
(page 665)

VOL. 84 No. 2154

22 October 1960

THE WEEKLY NEWSPAPER OF THE CHEMICAL INDUSTRY





COMPRESSORS FOR INDUSTRY

One of a number of Brotherhood six crank five stage compressors supplied to The British Oxygen Company Ltd. Each compressor has a capacity of 8,670 m^3/hour, delivery pressure 185 atmospheres, driven by 3,050 H.P. synchronous motor.

Brotherhood compressors are designed to customers' exact requirements.

PETER BROTHERHOOD LTD.

PETERBOROUGH ENGLAND

Compressor and power plant specialists for nearly a century

P.3629

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INDEX TO ADVERTISERS

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

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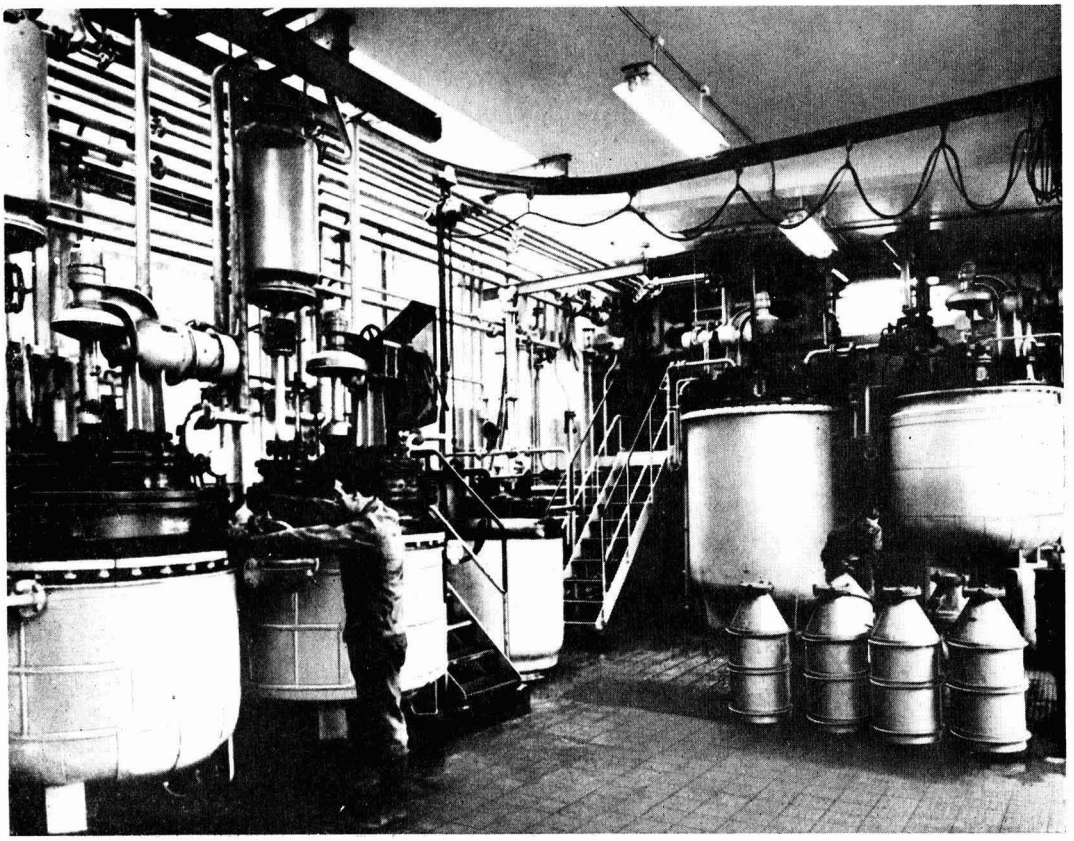
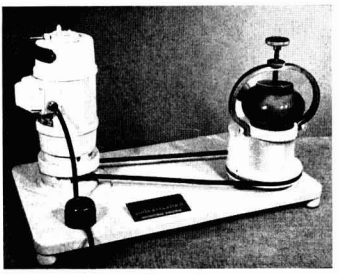


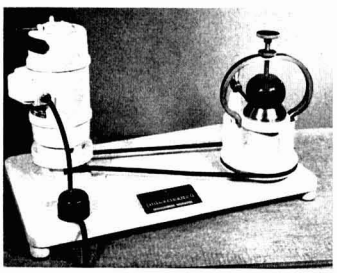
SIMPLO MODEL

pulverisette 0
MADE IN GERMANY REGIST. TRADE-MARK

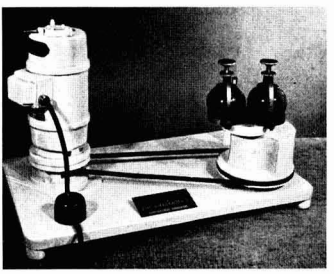
Only with REPULSION MOTOR with 110/220 V. A.C. 150 Watt



Simplo-Standard, Ref. Nr.: 000
(1 large pulverising bowl)



Modification 000/A
Simplo-Micro
1 small (micro) grinding bowl



Modification 000/B
Simplo-2 x Micro
2 small (micro) grinding bowls

INTERCHANGEABLE GRINDING PARTS

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

GRINDING BALLS:

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

Alfred fritsch
Hauptstrasse 542
Idar-Oberstein 1

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

SIMPLO MODEL

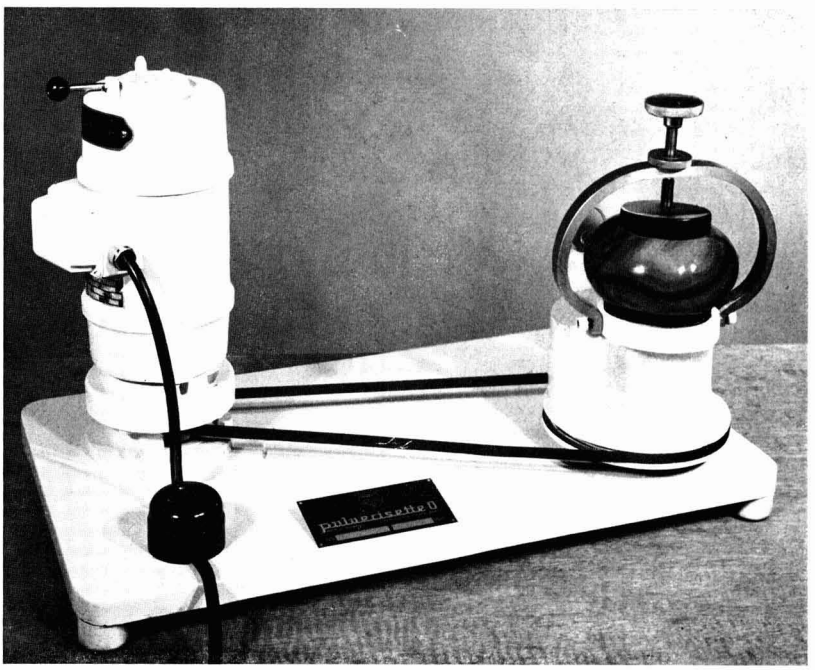
LABORATORY CENTRIFUGAL BALL MILL

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

pulverisette 0
MADE IN GERMANY REGIST. TRADE-MARK

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

Ref. Nr. 000



SIMPLO STANDARD

pulverisette 0 -SIMPLO
MADE IN GERMANY REGIST. TRADE-MARK

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

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

Variations:

Ref. Nr.: 000	= Simplo Standard	= Volume: ~ 250 c. cm.	= Useful capacity: ~ 150 c. cm.
Ref. Nr.: 000/A	= Simplo Micro	= Volume: ~ 50 c. cm	= Useful capacity: ~ 30 c. cm.
Ref. Nr.: 000/B	= Simplo-2 x Micro	= Volume: ~ 2 x 50 c. cm.	Useful capacity: ~ 2 x 30 c. cm.

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IN THIS ISSUE

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CHEMICAL AGE

BOUVERIE HOUSE · 154 FLEET STREET · LONDON · EC4

NO TRADE COLD WAR

THAT strong feelings have existed for some time across the Atlantic against the West selling chemical plants and know-how to the Soviet bloc is well known. What is perhaps not so well known is the fact that the initiative in opposing such trade stems from the U.S. chemical industry rather than from Washington.

At the A.B.C.M. annual dinner last week, General John Hull, president of the U.S. Manufacturing Chemists' Association, said that the views of the industry were sought following an approach from Premier Khruschev to President Eisenhower that the U.S. should supply chemical equipment and know-how on a large scale to the Soviet Union. Why the industry took a hand in political decisions was explained by General Hull in these words: "This is bigger than the chemical industry or any one industry, it's more important to all of us than any profit motive and it is a matter on which those who make the political decisions deserve the best advice on economic matters they can get."

The views of the M.C.A., summarised in p. 665, are certainly out of sympathy with feelings in this country and on the Continent. The major European chemical industries cannot exist on their own domestic trade—exports are all important. As Mr. S. P. Chambers, I.C.I.'s chairman, has pointed out before, British chemical producers are faced with one of their major export markets—the Common Market—raising an external tariff barrier; at the same time, expansion in the U.S. is not particularly attractive, for as soon as U.K. producers build up a market in a particular product the U.S. industry urgently lobbies for protection. This despite generous liberalisation of dollar imports in the U.K. and Europe.

The East European market is attractive. It is comparable in size to the Common Market. There is a high internal demand for consumer goods and competition in export markets; the economic war that General Hull talks about is not feared for a long time. If it should materialise, the Western trading blocs (if they are not by then merged) will be quick to impose anti-dumping duties should cut prices be quoted.

It is unlikely that sales of chemical processes to the U.S.S.R. would help Russia's war potential. In a country such as the Soviet Union, it is a simple matter to switch effort from consumer goods to military needs.

The British chemical industry, in the absence of a general Government embargo, has few inhibitions about trading with the Communist bloc. I.C.I., Distillers and Fisons are active in this field. Recently, Constructors John Brown have teamed with Marchon on a detergent materials deal with Moscow. Other U.K. contracting and chemical producing firms have linked in similar projects.

With only 85% of Soviet chemical construction plans fulfilled in 1959 more business is likely to be placed in West Europe in the coming months; several major projects are already under negotiation.

Many leading U.K. chemical companies, including the Kent subsidiary of Chas. Pfizer, New York, will take part in a big trade show in Moscow next spring. This is the best possible way of lessening international tension; the U.S. industry's approach can only bring the 'cold war' into business circles. Fortunately, this is one occasion when Britain is unlikely to adopt the American line.

DISTILLATES

★ CHEMICAL AGE is published in Fleet Street. This week two close old friends and working neighbours of ours, *News Chronicle* and *The Star*, have ceased publication. A sad commentary on the modern world that unfashionable opinion cannot survive. The ghosts of Charles Dickens, T. P. O'Connor, A. G. Gardiner and J. A. Spender, great journalists, great editors, great exponents of the liberal outlook, now turn their faces to the wall.

★ FROM the cold war in trade with Russia of General Hull, M.C.A. president (see p. 665), to the more rational war in anti-freeze, which shows signs of hotting up. This year Boots Pure Drug Co. are entering the anti-freeze field in a much bigger way than ever before. Optimistic estimates place the U.K. anti-freeze potential market in 1960-61 at 19,000 tons; something nearer 15,000 tons is my guess; the 1957-58 figure was between 10,000 and 11,000 tons. In any event Boots will make further inroads into this market, particularly so far as Bluecol, who hold a major share of U.K. sales, are concerned.

Like all the major U.K. brands, Boots anti-freeze is based on ethylene glycol. I.C.I., Shell Chemical and Union Carbide are the three U.K. EG producers. Capacity figures are not available, but the biggest use is in Terylene production, followed by anti-freeze, cellulose film and electrolytic condensers.

Inhibitors used by Boots are triethanol-amine phosphate and sodium mercapto-benzothiazole, the latter intended to inhibit corrosion in brass and therefore probably not really necessary for the modern car. This inhibitor system is based on B.S. 3150. Other anti-freeze additives are 2.5% borax or a mixture of sodium benzoate and sodium nitrite (either 7.5% to 0.5% or 5% to 0.5%) to B.S. 3151. Monsanto and W. J. Bush are the major suppliers, Bush marketing a ready-mixed inhibitor under the trade name Sobanite.

★ 'PROCESS engineer's nightmare' might be an apt description of the annual report of the National Industrial Fuel Efficiency Service (see p. 668). When N.I.F.E.S. arrived at one chemical works to make a heat and power survey they found that thousands of pounds of steam an hour were passing to heating coils in old vessels no longer used. Obviously the services of a N.I.F.E.S. engineer can be very rewarding for at another works losses, due to leaks and poor insulation in the steam distribution system, were 13% of steam consumption; the savings here were more than £1,000/year.

In some processes, provision is made for a small steam flow through pipes used for pumping concentrated solutions after the liquor flow has stopped. This prevents crystallisation and blockages. But in one line, 250 lb. of steam per hour were flowing constantly through lack of attention and the difficulty of regulating a hand valve. An orifice plate in the steam main, throttling the flow to a maximum 50 lb./hr., did the trick.

Like N.I.F.E.S. engineers, I have often wondered why storage tanks containing heated liquids are frequently left uncovered. In one case, £200 a year was saved by fitting a wooden cover to an outdoor tank in a chalk hydration process; £40 a year by covering a caustic soda vessel; and over £3,000/year by insulating large tanks for hot water storage.

★ WHILE on the subject of waste it is worth noting that the chemical industry can be on the receiving end on occasions. For instance I learn from 'Waste or Wealth', a new D.S.I.R. publication, that several million gallons of paint are poured down the proverbial drain each year. It seems that half the paint directed at car bodies is lost as over-spray. That few attempts are made to recover and re-use paint must be gratifying to the paint industry. Many other cases of the profit to be made from making sow's ears into silk purses are quoted. The British Iron and Steel Research Association has developed up to pilot scale an autoxidation process for acid recovery from the ferrous sulphate

'Careful to minimise the quantities of liquid lost through spillage'

(From the D.S.I.R. booklet 'Waste or Wealth')

left after pickling steel sheet before tinning. After concentration ferrous sulphate monohydrate crystallises out and is roasted; sulphur dioxide gas is driven off and oxidised to sulphur trioxide and thence to sulphuric acid. Up to 40% acid can be recovered, and the value of this and iron oxide offsets the cost of recovery. The process has yet to be exploited commercially because other well-known methods are currently used.

★ WASTE again—this time the waste of a plant to treat waste. For at Los Angeles the municipal authorities have called a halt to the production of fertiliser from sewage sludge at their Hyperion plant, proudly brought into operation some 10 years ago, because it has proved wasteful of public funds. So away goes about $7 million worth of equipment into mothballs, and back goes the sludge into the sea.

It eventually proved more economical to scrap the plant than to continue production, for while sales of fertiliser from the 100 tons/day plant brought in about $4/ton, production costs are reckoned to have worked out at about $26/ton. Those universally renowned characters, 'Indignant Ratepayer' and 'Pro Bono Publico', must have been provided with plenty of scope for letters to the local papers.

★ STATISTICS can be dull, but not the way that Mr. P. D. O'Brien, Laporte Industries chairman, used them at a dinner of the company's '25-year Club' at Luton on 11 October, two days before he left on a world business tour. (See p. 679.) To indicate the scale of the group's operations, he said that while they had been dining, Laporte plants had produced 40 tons of 100% sulphuric acid.

That is only one of the group's many products—and that figure should keep some of my statistically minded readers busy for a few minutes. Laporte also plan a new hydrofluoric acid plant at Sheffield and are to boost output from the existing plant (see p. 663); but no output figures—dinner-wise or otherwise—are available.

★ A RUSSIAN may have discovered 'formolite', says Dr. J. E. Goodrich, research chemist with the California Research Corporation, but it took an American to find a use for it.

Formolite is a yellow powdered resin that has been sitting unused on the laboratory shelf ever since 1903, when the Russian chemist Nastyukov discovered it. It is made from formaldehyde and an aromatic compound.

Unlike phenol-formaldehyde (Bakelite) and urea-formaldehyde (Beetleware), this resin has never found a commercial use. By adding a dispersing agent to formolite resins, Dr. Goodrich has produced resins with very small particle size and, consequently, large surface area. The new resins have many potential uses as thickeners in lubricating grease, lacquers, paints, varnishes, inks, putty and adhesives. With a wetting agent added, they are useful in creams, emulsions, latex paints and drilling muds.

Nastyukov found that aromatic compounds react with formaldehyde at room temperature in the presence of concentrated sulphuric acid to give yellow resins which will not melt and which are insoluble in ordinary solvents. Goodrich added a dispersing agent and got micro-dispersed resins similar to fine talc in appearance. Among the most effective dispersing agents are the petroleum sulphonic acids. The new resins have already been produced in a pilot plant.

Alembic

B.D.H. Confirm New Merger Talks, but Company Not Named

Shortly after 'Chemical Age' went to Press last week, Mr. G. C. R. Eley, chairman of British Drug Houses Ltd., confirmed rumours that B.D.H. directors were involved in preliminary stages of merger talks with another company.

Mr. Eley said his attention had been drawn to the recent and sudden rise in the price of the company's shares (a 5s rise to 22s 6d). No offer, however, had been made by last Thursday and the discussions might well come to nothing, he added.

Current market valuation on B.D.H. is well in excess of £8 million. In February, Fisons Ltd. made a strong bid to acquire the company's capital; this was withdrawn because of insufficient acceptances.

Fisons last week denied that they were involved in the new merger talks. A number of other companies were named last week as likely to be interested, but the Beecham Group, I.C.I. and Boots Pure Drug Co. stated they had no knowledge of any talks. Of other companies, Glaxo Laboratories said they had "no comment" to make. City opinion also considers it likely that a U.S. producer might be involved.

Sturge to Make Citric Acid in C.M.

CONCLUSION of negotiations for the sale of their citric acid manufacturing process for exploitation in the Common Market has been announced by John and E. Sturge Ltd. This was one of the overseas developments foreshadowed in their prospectus in June.

A new company, Biacor S.p.A. (Biochimica per la Produzione di Acidi Organici) has been formed in Italy for this purpose in which Sturge will have an important shareholding. A site has been purchased in Northern Italy providing ample space for future expansion, and planning is well advanced for the construction of the first stage of the development, with a capacity of 3,000 tons/year of citric acid. It is anticipated that production at this level will commence by the end of 1961.

Total investment required by the new company for the first stage of development is about £750,000.

I.C.I. to Market Syntex Drugs in U.K.

An agreement has been signed by I.C.I. to market Syntex Corporation drugs in Britain and the Commonwealth. This is the first marketing arrangement that Syntex, a Mexican-based company, have concluded outside the western hemisphere, and the drugs will be sold under their trade mark.

Project News

Laporte Boost HF Output to Meet Electronics Demand

A NEW hydrofluoric acid plant now being completed at Sheffield by **James Wilkinson and Sons Ltd.,** due on stream early in 1961, will provide substantial tonnages to meet the rising demands of the electronics industry which have developed successfully, particularly in the past 18 months. In addition, the company has taken urgent steps to raise production of the existing plant.

Specialists in fluorine chemicals, Wilkinson's, a member of the Laporte Group, perfected their own manufacturing technique to produce hydrofluoric acid "of the highest grade of purity in Europe" for the electronics industry. The acid has found two main applications in this field. Firstly, it is used in processes for producing silicon and germanium, two materials for semiconductors. Secondly, manufacturers themselves use the acid for etching transistors and other semi-conductor devices.

Apart from benefiting home trade users, Wilkinson's increased production is expected to lead to an expansion of their export trade. Previously it has not been possible to meet demands from the major overseas consuming markets.

S.W.T.D. Phthalic Anhydride Plant Started Up

● START-UP of the new phthalic anhydride plant of **South Western Tar Distillers Ltd.** at Totton, Southampton, with a capacity of over 3,000 tons/year, has been announced. The plant was constructed by the company in co-operation with Saint-Gobain, Paris, whose process is being used.

Saint-Gobain, with six licencees, account for more than 10% of the Free World phthalic anhydride production and are currently doubling their facilities at Chauny, France, switching for this new plant to orthoxylene as a raw material.

Shell Rubber Plant Due for Completion Early 1963

● CURRENTLY delivering about 140,000 tons of products a year the Carrington works of **Shell Chemical Co. Ltd.** exports at least 30% of output. In addition to the polyolefins plant, due on stream next year with a 30,000 tons/year capacity, the polydiene rubber plant, now in the design stage, should be completed by the beginning of 1963.

Boby to Extend Monsanto Water Treatment Plant

● A £4,500 contract has been awarded by Monsanto Chemicals Ltd. to **William Boby and Co. Ltd.,** Rickmansworth, Herts, to modernise and augment the existing Boby water treatment plant at Ruabon.

Other recent Boby contracts include a £25,000 contract from English Electric for effluent treatment plant at Hinckley Point nuclear power station and a contract for pressure filters and chemical dosing plant for the Windygates distillery of the Distillers Company.

Contract for New Boots Plant Goes to Humglas

● A CONTRACT for a new plant has been awarded to Humphreys and Glasgow Ltd. by **Boots Pure Drug Co.** Neither company is at present releasing any details of the new project.

Glass Fibre Stack for B.I.P. Chemicals Boiler Plant

● **B.I.P. Chemicals Ltd.,** Oldbury, have placed a contract for a new boilerhouse plant and coal-firing equipment capable of raising 80,000 lb. of superheated steam per hour, with Truswell and Son Ltd., Newcastle, Staffs, one of the How Group Associates. The contract is for completion by the end of 1961. A feature of this plant will be the inclusion of a glass fibre resin-bonded chimney, 150 ft. high.

Bath Firm to Supply Equipment for Soviet Pipeline

● VALVE control equipment for a Soviet pipeline linking oilfields between the Urals and the Volga River with East Europe is to be supplied by **Rotork Engineering Ltd.,** Bath. The equipment is to be manufactured under licence by Nouvopignone, Florence, a subsidiary of E.N.I.-A.G.I.P., the Italian State group which has concluded an agreement to supply the U.S.S.R. with steel tubes for oil and gas pipelines, plus synthetic rubber, in exchange for considerably increased imports of Soviet oil (see 'Overseas News', p. 676).

Simon-Carves Otto Plant Opened in Guernsey

● THE new **Simon-Carves** Otto gas producing plant—the first of its kind in the U.K.—was opened in Guernsey on 13 October. Built for the Guernsey Gas Light Co. Ltd., it is a continuous catalytic reforming plant that converts butane into town gas; petroleum gas is imported from Denmark.

Duke of Edinburgh to Open Milford Haven Refinery

The new Esso refinery on Milford Haven, Pembrokeshire, will be opened by the Duke of Edinburgh on Thursday, 3 November.

New H_2S Recovery Process Halves Gas Purification Costs

SUCCESSFUL development of the Stretford process for extracting hydrogen sulphide and recovering pure sulphur from coal gas, petroleum gas and other gases has culminated in the joint application for world-wide patents by the North Western Gas Board and Clayton Aniline Co. Ltd. If patents are granted, licences to exploit the process will be granted to six well known chemical engineering firms: W. C. Holmes and Co. Ltd., Newton Chambers and Co. Ltd., R. and J. Dempster Ltd., Simon-Carves Ltd., Humphreys and Glasgow Ltd., and Woodall-Duckham Construction Co. Ltd.

The new process, using certain reagents produced in the manufacture of anthraquinone dyes from coal tar, which can be regenerated and used over and over again in a continuous cycle, has far-reaching industrial possibilities as well as being of immediate interest to the gas industry. It is claimed to be much cheaper, cleaner and safer than existing purification systems.

The process—called the Stretford process because the practical development of the idea was carried out at the North Western Gas Board's Stretford laboratories—has been on test on a commercial scale for the past year at two of the N.W.G.B. production stations: Rochdale Road, Manchester, and Whitchurch. A third Stretford plant is shortly to be installed at one of the Board's largest works, the Linacre station in Liverpool. Initial development work was carried out by a team of N.W.G.B. technologists led by Dr. T. Nicklin, the Board's chief scientist, and by the research department of the Clayton Aniline Co. under the company's research manager, Dr. E. Brunner.

Economics. Essentially, the Stretford process consists of washing the gas to be purified with a mixture of the sodium salts, dissolved in water, of two special forms of anthraquinone di-sulphonic acids. These are the '2-6' and '2-7' forms, the molecular structure of which imparts a specially speedy reactivity.

The process is cyclic, continuous, and automatic, the liquid reagents being regenerated in the course of the cycle as the sulphur is filtered out in finely divided form. The cost of purification has been about 2d/therm at Rochdale Road and Whitchurch, and at times as low as 1d/therm, according to the market price obtained for the recovered sulphur. This compares with the cost of 3d/therm for conventional box-purifiers, which in addition are a dirty and cumbersome method involving some danger when the iron boxes holding the saturated oxide are emptied.

Purification Cycle. There are four steps in the purification cycle:

(1) The gas passes upwards through a washing chamber meeting the anthraquinone di-sulphonic sodium salt solution, injected as a spray at the top of the chamber, as it drips downward in a film over the washing grids. In this step the solution removes the H_2S from the gas. The gas passes out of the washer at the top ready for use.

(2) The solution carrying the H_2S with it passes into a reaction tank where it is allowed to stay for sufficient time to permit the H_2S to react with the carbonyl radicals of the solution to produce free sulphur and the corresponding hydroquinone.

(3) The solution is pumped from the reaction tank into an oxidation tower through injectors which entrain sufficient air to convert the hydroquinone back to the original quinone, ready for another cycle.

(4) Before the solution, now holding free sulphur, is passed back into the washer to complete a fresh cycle, it is passed through a continuous rotary vacuum filter which removes the sulphur from it.

Further Applications. Industrial applications outside the gas industry envisaged by the N.W.G.B. and Clayton Aniline include:

(a) Removal of H_2S from the gases now blown to waste in the oil fields, resulting in the recovery of marketable sulphur and the elimination of unpleasant smells.

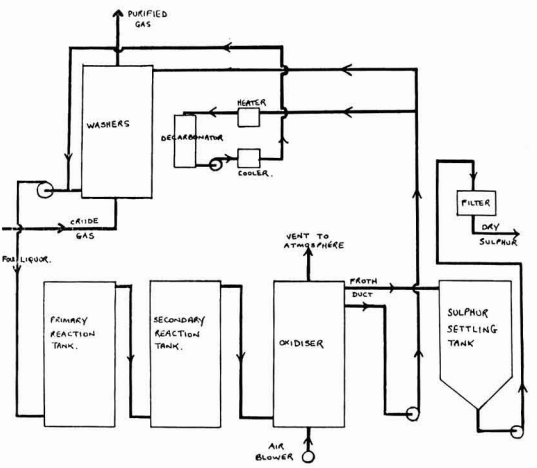
(b) Treatment of waste gases at oil refineries and tail gases sold to the chemical and gas industries.

(c) Cheap purification of a wide range of liquid products contaminated with H_2S which are marketed by the oil industry.

(d) In the rayon (viscose) and transparent paper industry removal of H_2S and carbon bi-sulphide from the air and cheapening of the whole manufacture by preventing the degradation of the active carbon used.

(e) Recovery of pure sulphur in the purification of synthesis gas.

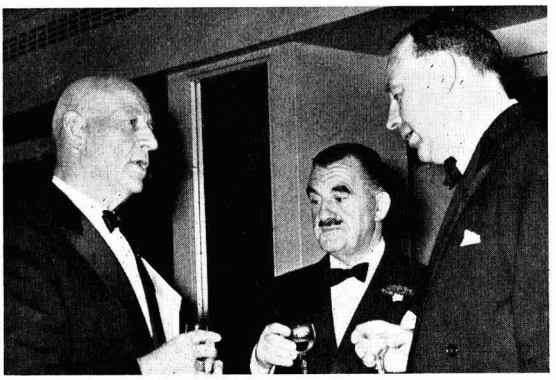
Leading personalities in the development of the Stretford process, seen here, were (left to right) Dr. E. Brunner, research manager, and Mr. R. Isherwood, both of Clayton Aniline Co., and Dr. T. Nicklin, North Western Gas Board chief scientist



Simplified flow diagram of the Stretford process

G. and G. Open Manchester Sales and Service Centre

To mark 50 years of the Griffin and George Group of Companies' and their forebears' establishment in Manchester, a new sales and service centre was opened on 10 October at Ledson Road, Wythenshawe, Manchester 23, by Mr. K. G. Sinclair, chairman of the group. The new buildings were designed and the construction supervised by the Technical Division of Production Engineering Ltd., and the main contractors were the Manchester firm of N. G. Mitchell Ltd.



Left, Sir William Garrett (Monsanto Chemicals Ltd.), A.B.C.M. chairman, with Mr. John C. Hanbury (Allen and Hanburys Ltd.), vice-chairman. Right, l. to r., General John E. Hull, president, Manufacturing Chemists' Association, N. F. Patterson, chairman, British Chemical Industry Safety Council, and M. J. C. Hutton Wilson (Associated Chemical Companies Ltd.), council member

★

A.B.C.M. Annual Dinner

★

General Hull, M.C.A. President, Opposes Plant and Know-how Sales to Russia

★

These are his reasons:

1 **Free-world technological advances and chemical know-how are major factors in an economic war.**

2 **The time advantage these give the West should not be bartered away; for without Western aid, the U.S.S.R. may not reach its chemical goals.**

3 **Know-how sold to the Soviet Union will be made available to other Communist States.**

4 **There is no long-term economic advantage in know-how trade with East Europe.**

5 **When the U.S.S.R. is on level terms with the West, prices will be cut to drive out competition.**

REASONS for the U.S. chemical industry's strong feelings against the sale of complete chemical plants and know-how to the Soviet Union were forcefully put by General John E. Hull, president of the Manufacturing Chemists' Association, at the A.B.C.M. annual dinner on 12 October. He saw no reason why the West should help the U.S.S.R. overcome the many problems involved in developing its chemical industry; this would only aid the Soviet Union in waging its economic war against the West.

The time factor, now a big advantage of the free world, should not be bartered lightly. Since his arrival in the U.K. on the day before the dinner, the General had talked to leaders of the U.K. chemical industry, and he knew that many Association of British Chemical Manufacturers members held different views on trading with Communist countries—and they included, he added, Sir Alexander Fleck.

General Hull also commented on the two trading blocs in Europe and spoke about current conditions in the U.S. chemical industry where a continuing rise in sales is accompanied by a further narrowing of profit margins—the most serious problem facing the industry.

He was replying to the toast of 'Our Guests', proposed by Sir William Garrett, A.B.C.M. chairman, who said that General Hull had made a special journey to England to attend the dinner. Sir William presided at the dinner, which was attended by 1,200 members and guests. Among the chief guests were Sir Alexander Fleck, president, Society of Chemical Industry; Sir Harry Jephcott, chairman, Council for Scientific and Industrial Research; Sir William Palmer, chairman, Dyestuffs Advisory Committee, Board of Trade; Sir Richard Powell, permanent secretary, Board of Trade; and Sir Leslie Robinson, second secretary, Board of Trade.

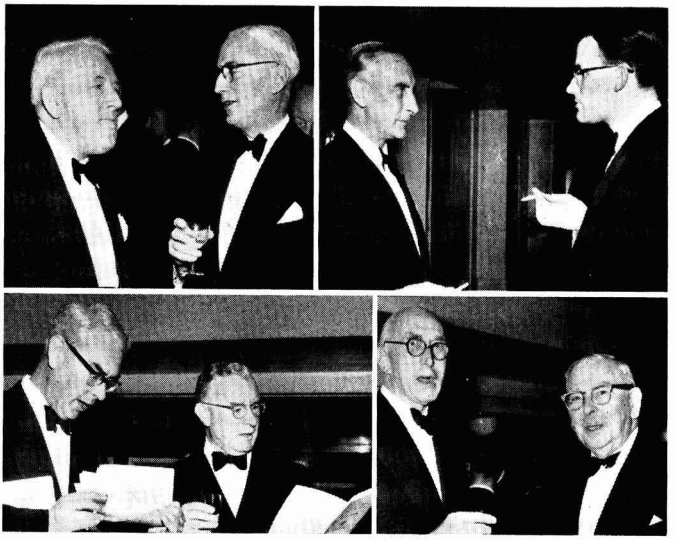
General Hull said that following a proposal by Premier Khruschev to President Eisenhower that the U.S.S.R. should procure on an extensive scale industrial and technical data and know-how for the production of a variety of basic chemical products, the M.C.A. was asked for the views of the U.S. industry. An M.C.A. study led to a recommendation against the sale or transfer of any chemical technological information to the Russians that was not generally known throughout the world.

M.C.A. did not oppose trade in commodities or products that did not conflict with U.S. national security. Technological advances and chemical industry know-how were one of the great advantages that the free world had over the U.S.S.R. and the Communist bloc in the economic war. Mr. Khruschev had declared that those were major factors in world economic competition.

By 1965, the U.S.S.R. was supposed to expand chemical industry by 300%, with the accent on alcohol, plastics, synthetic fibres and synthetic rubber. Capital expenditures of some £9,000 million had been allocated for the rebuilding and expansion of the industry. In addition, some £6,000 million of the amount earmarked for the oil industry would go into petrochemicals. To give some appreciation of what that meant in terms of expansion, General Hull said that the entire U.S. chemical industry had assets worth £8,500 million.

Without help from the West the Soviet chemical industry would very likely fall short of its goals. There were shortages of skilled technicians; there were management difficulties, for the Soviet chemical industry had been entangled in red tape for a long time; there were serious equipment shortages. Those were the problems Khruschev was trying to solve when he offered to buy $100 million worth of U.S. chemical equipment and technology—on credit, of course.

The U.S.S.R. wanted to purchase complete plants, but those could not be sold to the Russians and Russian personnel trained to operate them without giving them the benefit of U.S. advances. "Admittedly Soviet Russia could in time attain the technical advances we have made should she devote the necessary



TOP, l. to r.: Sir Alexander Fleck, president, Society of Chemical Industry, with Sir Henry Jones, chairman, Gas Council; F. G. W. Paige, director, British Chemical and Dyestuffs Traders' Association, with F. J. Benton, Board of Trade Industries and Manufactures Department. BELOW, l. to r.: A. L. Burgess, assistant secretary, B.o.T. Industries and Manufactures Department, with Sir Richard Powell, Permanent Secretary, B.o.T., Sir Harry Jephcott (Glaxo Laboratories Ltd.), chairman, D.S.I.R. Council, and Kenneth Wilson (Albright and Wilson), A.B.C.M. hon. vice-president

effort to this end, instead of to her military programme," declared General Hull. "Her scientists are just as able as those of the West. However, this is the time factor which we now hold over the Russians and which we should not barter away lightly."

Another consideration was that any know-how sold to the U.S.S.R. would become available to the entire industry of that country and possibly to the entire Communist bloc, if the Kremlin decided it was to its advantage to pass this information on to other Communist states. Since the U.S.S.R. was not a signatory to the International Patents Agreement, that country would only protect a process licensed to the Soviet Union so long as it was to its advantage to do so . . . "and she hasn't a very good record in keeping her agreements with us".

The consumer demand impetus behind Western chemical industries had been lacking in Russia. General Hull declared that Russia's use of trade and goods to weaken other economies or to capture markets for their exclusive province was now going on on a scale larger than many realised. The Russians could and did cut prices to drive out competition; when sure of their markets, as in dependent European countries, they set their prices high.

There was no long-term economic or political gain for the West in transactions with the U.S.S.R., for once the Russians got the technology they needed, trade would stop.

Turning to European trade, General Hull stated there was no clear-cut answer as to how the U.S. chemical industry would fare in the face of the two trade blocs. However, both individually and collectively, Europe offered a market that continued to grow very fast. Europe's chemical industry would continue to grow no matter what developments took place in the trade blocs and Europe would become more self-sufficient in many chemicals. The increasing market would lead to larger and more economic production units, lower prices, larger sales, the development of new products. The resulting higher living standards would create demand for a widening range of products, giving opportunities to the chemical industry of all lands.

"If You Can't Lick Them —Join Them"

The U.S. chemical industry was taking steps to meet competition from the Common Market and the European Free Trade Association by investing in foreign production facilities; this trend would increase over the next five years. In meeting stiffer competition, U.S. chemical producers were adopting the old adage: "If you can't lick them, join them".

U.S. exports would probably be hurt most by the new external tariffs of the Common Market, for it was by far the more important European market for U.S. chemicals.

So far as the U.S. chemical industry was concerned, capacities were mostly being utilised to between 80 and 85%. It appeared that sales for the last half of 1960 might be at least 5% up on those of the first half of the year. In that event, the year's sales volume would approach a record $28,000 million ($25,700 million in 1959). The upward sales trend was expected to continue next year.

For most companies, however, rises in sales were accompanied by slight falls in net earnings per share. This was expected to improve only slightly in the last half of 1960, because costs were expected to jump 5% or more. This narrowing of profit margins was the most serious problem facing the chemical industry. Despite this the industry's expansion projects were progressing on schedule and capital spending was not being held up because of existing or threatened over-capacities. Over-capacities in selected lines were thought to constitute a serious problem for the industry.

No Major Changes in A.B.C.M. Officers for 1960-61

THERE were no changes in the major offices of the Association of British Chemical Manufacturers at the annual meeting on 13 October. The council for 1960-61 will be as follows:

President: Mr. G. F. Williams (The British Drug Houses Ltd.); *vice-presidents:* Dr. F. H. Carr, C.B.E., Sir Roger Duncalfe, Dr. E. V. Evans, O.B.E., Sir Graham Hayman (The Distillers Co. Ltd.), Mr. H. Hickson (Hickson and Welch Ltd.), Sir Harry Jephcott (Glaxo Laboratories Ltd.), Mr. C. F. Merriam, M.C.

Elected Members

Chairman: Sir William Garrett, M.B.E., J.P. (Monsanto Chemicals Ltd.); *vice-chairman:* Mr. J. C. Hanbury (Allen and Hanburys Ltd.); *hon. treasurer:* Mr. J. L. Harvey, M.B.E., D.L. (Fullers' Earth Union Ltd.).

G. H. Beeby (British Titan Products), E. L. Bush (W. J. Bush and Co.), G. H. W. Cullinan (Shell Chemical), I. V. L. Fergusson (Evans Medical), M. J. C. Hutton-Wilson (Associated Chemical Companies), W. K. McGavin (Shell Chemical), P. D. O'Brien (Laporte Chemicals), F. S. Poole (Peter Spence and Sons), H. G. Rolfe (British Drug Houses), W. D. Scott (Imperial Chemical Industries), E. Stein (The Distillers Co.), Dr. J. E. Taylor (Unilever), B. White (A. Boake, Roberts), G. H. Carnall (Clayton Aniline Co.), J. C. Christopherson (Albright and Wilson (Mfg.)), C. E. Evans, O.B.E. (British Hydrocarbon Chemicals), J. H. Townsend (I.C.I.).

Regional chairmen: London and S.E.—T. W. Howard (Howards of Ilford Ltd.); Midlands—Dr. W. Blakey (B.I.P. Chemicals); N.E.—W. K. Hall, O.B.E. (I.C.I. Billingham Division); N.W.—Dr. J. E. Taylor (Unilever). Scottish—J. Angus (Scottish Agricultural Industries); S.W.—H. L. Thompson (National Smelting Co. Ltd.).

Hon. vice-presidents: C. E. Carey (South Eastern Gas Board); Lord McGowan, K.B.E. (I.C.I.); L. P. O'Brien; K. H. Wilson, O.B.E., J.P.; Sir Walter Worboys.

Director: George Brearley; *general secretary:* A. J. Holden.

B.o.T. Gives U.S. Exporters Unfair Concession on Dyestuffs, says A.B.C.M.

CONSIDERABLE common ground among European chemical associations, which called for even closer collaboration in an attempt to solve the difficulties arising from the existence of two economic blocs was referred to by Sir William Garrett, chairman of the Association of British Chemical Manufacturers when he moved adoption of the council's report at the annual meeting last week. As stated in CHEMICAL AGE last week, p. 624, member associations of the Centre Europeen de Federations de l'Industrie Chimique have undertaken to consider in detail in their own countries the possible effects on the main sections of the chemical industry of the setting up of a free market covering the whole of West Europe.

So far as the A.B.C.M. is concerned this would call, said Sir William, for co-operation with its affiliated and some allied association. Through C.E.F.I.C., A.B.C.M. was able and willing, with advantage to all, to co-ordinate the activities of the various U.K. trade associations concerned with chemicals and allied products, in these joint studies.

Canadian Tariffs

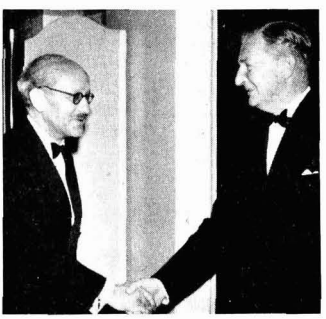
Following the visit of Mr. H. W. Vallender to Ottawa to represent the A.B.C.M. at the Canadian Tariff Board hearing on chemicals (CHEMICAL AGE, 1 October, p. 538), it was hoped that the Canadian chemical producers would be willing to think more in terms of "our own import procedure when domestic manufacturers are unable to meet a substantial part of the home requirements."

Sir William explained a proposed change in the articles of association which would enable purely holding companies to be eligible for membership. At present only companies producing chemicals in the U.K. could be members of A.B.C.M. In some cases, the main directors, needed by A.B.C.M. on its council and committees, were not directors of the subsidiary companies, and could not therefore serve. The proposal to change the articles was carried.

Dyestuffs. The council's report states that the year had been momentous in the history of the dyestuffs committee for on 2 March the Dyestuffs Acts were repealed and replaced by a 33⅓% *ad valorem* duty. Following a protest against the fact that China would be free to export to the U.K. dyes and intermediates included in the Open General Licence on payment of a 33⅓% duty, China was transferred from the 'relaxation' to the 'eastern area,' which necessitates the issuing of individual import licences.

Still under discussion with the Board of Trade is the future provision of import statistics, which have proved valuable in the past as an aid to research and which would be valuable in assisting the policing of the proper operation of the origin rules under the new convention of the European Free Trade Association.

When the B.o.T. president announced that to reach agreement between the



Sir William Garrett, A.B.C.M. chairman, receives G. F. Williams, president, left

'Six' and the 'Seven,' the 'Outer Seven' countries would be willing to offer tariff cuts to the 'Six' on a reciprocal basis, but to the U.S. without reciprocity, a strong protest was made. Attention was drawn to the unfair position in which the British dyestuffs industry would be placed by still further concessions to the U.S. without reciprocity. Despite the great concession, shared by the U.S. of replacing the Dyestuffs Acts with a 33⅓% duty, the U.S., by basing its duties on the U.S. selling price, still retains a protective duty of the order from 70 to 100%. This unfair situation, which also applies to certain organic chemicals, also arises in connection with the current G.A.T.T. revision.

Tariffs. The number of temporary exemptions from the Import Duties Act, 1958, has increased considerably, mainly due to adoption of the Brussels Nomenclature and the fact that almost all organic chemicals now carry a duty of 33⅓%. Discussions are in hand with the B.o.T. to streamline existing procedure and to cut, if possible, the number of chemicals for which duty exemption is sought.

Following discussions on the problem of base-date tariffs under the E.F.T.A. convention, a formula has been agreed under which duties on certain chemicals can be restored against E.F.T.A. members, even if those duties were suspended on the base-date of 1 January 1960.

No solution satisfactory to the chemical industry has been reached in discussions with the B.o.T. on the duty on reaction mixtures and on mixtures of synthetic organic chemicals. Further consideration is deferred until a specific case arises.

So far as the problem of dumping in West Europe is concerned, it is felt that caution is necessary since anti-dumping powers might in some countries be used without restraint to the detriment of British export trade.

Canadian Tariff Hearing. Mr. H. W. Vallender had presented the A.B.C.M. brief to the Canadian Tariff Board and the association's offer to help in transposing the tariff into the Brussels form has been welcomed.

European Economic Community. Up to now, duty cuts within E.E.C. have been made available to other G.A.T.T. countries, provided such reductions do not result in lower duties to non-members of E.E.C. than would be required under the final common tariff. The discrimination against non-members has thus been marginal, but the latest decision to accelerate the Treaty of Rome timetable will result in duties being charged on many chemicals into Benelux from the U.K. on 1 January 1961, while E.E.C.-members will continue to trade duty-free.

Process criteria under origin rules for chemicals were successfully negotiated at the E.F.T.A. Stockholm meeting for almost the whole of the chemical field.

C.E.F.I.C. Working parties of the Centre Europeen des Federations de l'Industrie Chimique (C.E.F.I.C.), on which A.B.C.M. is represented, have studied the comparability and scope of statistics for European chemical industries. Detailed consideration has been given to the effects on the industry of the application of the Convention on Valuation of Goods for Duty Purposes.

Dumping in Europe

A comparative study has been made of the existing legislative power in West European countries to deal with dumping and the desirability of setting up common policies and powers to combat dumping have been discussed.

Chemical Engineering Research. Two working parties of the liquid/solid separation panel have considered the problem of the blinding of filter media and the washing and draining of beds. Both proposed that a critical literature survey be carried out in the whole field of liquid/solid separation and this is being taken up with the Department for Scientific and Industrial Research.

Productivity. The productivity committee continued to try to secure further improvements in deliveries of chemical plant and equipment. Following a joint meeting with British Chemical Plant Manufacturers' Association in November 1959, it was agreed that a list of standard plant and equipment be supplied by B.C.P.M.A. for circulation to A.B.C.M. members for their comments and recommendations regarding additions. Receipt of the list from B.C.P.M.A. was still awaited.

The British Productivity Council has produced a revised draft of a 'Review of the Heavy Chemical Industry,' but this has not yet been published.

Work is continuing on two booklets being produced by the work study

advisory committee. 'Incentive schemes based on work study for process and general workers in the chemical industry' is approaching the final stages of preparation. Work is in hand on 'Work-study applied to plant maintenance.'

Safety. Lost-time and accident statistics for 1959 showed a continued slight improvement. A number of companies have reduced their frequency rate as the result of suggestions made during visits by the secretary of the British Chemical Industry Safety Council.

Trade Effluents, etc. A.B.C.M. accepted the two main recommendations of the Armer committee—that pre-1951 discharges to non-tidal waters should be subject to gradual control by the 'flexible consent' procedure instead of rigid by-law standards; and that pre-1937 discharges to sewers should continue in accordance with present conditions, but should be subject to reasonable charges for the cost of treatment by the local authority. The latter was accepted in the public interest, but it was realised that the change would result in financial commitments which might be heavy in some cases.

A minority recommendation that, provided specific river board conditions were satisfied, there should be a limit of the remedy by way of perpetual injunction, was strongly supported by A.B.C.M. The Ministry of Housing has been urged to implement this recommendation in any resulting legislation.

Transport. The Traffic Committee supported the Transport Minister's proposal to raise from 24 to 28 tons the permissible gross laden weight of rigid road tankers for bulk liquids. The Minister, however, has had second thoughts and for safety reasons does not think that a change is justified.

Trade with Russia. Several members are in direct contact with the U.S.S.R. or with members of the British Chemical Plant Manufacturers' Association, independent of the joint B.C.P.M.A./A.B.C.M. procedure. A.B.C.M. council has reaffirmed its view that provision of process know-how is a matter for decision of each individual member.

Restrictive Practices. Registration of the rebottling agreement by makers of sodium hypochlorite under the Restrictive Trade Practices Act was cancelled during the year. A.B.C.M. have, by request, resumed the secretarial service that was withdrawn in 1956.

Port Appraisal. The traffic committee is preparing a factual appraisal of the position in U.K. ports in view of a statement that British importers are often handicapped to the extent of 10s a ton on certain raw materials as compared with Continental competitors because of bad facilities and slow rate of discharge at the ports.

Chemical Industry Fuel Consumption Cut 18.7% by N.I.F.E.S. Surveys

MEAN savings of 18.7% on fuel consumption in the chemical industry in the period 1954-60 have been achieved through heat and power surveys carried out for companies by the National Industrial Fuel Efficiency Service. In that period 127 surveys have been handled for chemical firms, 22 of which were undertaken in the period 1959-60. In all, N.I.F.E.S. have carried out 169 of these surveys in chemical works covering more than 800,000 tons of fuel a year. Mean savings in boiler plants were 15.2%, on process, 24.3% of the heat used was saved. (See also 'Distillates', p. 662.)

N.I.F.E.S. annual report points out that even in chemical works where the central boiler plant is well maintained, combustion conditions in direct-fired pots and stills are often bad. In one oil-fired still, improvements made by N.I.F.E.S. staff produced a saving of £2,300 a year and cured a smoke nuisance. In another furnace, savings were over £5,000 a year and batch process time was cut 10%.

On a pot fusion process, waste gases left a small oil-fired furnace at about 1,100°C and were led into an adjacent pneumatic drier, which had previously been directly fired. Savings in using these waste gases were nearly £1,000/year.

The N.I.F.E.S. pinpoints many other possibilities of saving on chemical works' fuel bills combining this with higher efficiencies and greater productivity. In one large plant, it was found that 30% of steam was being used solely to heat jacketed lines; 25% of that steam was saved by improving insulation, eliminating long runs of pipe to steam traps and by stopping leaks.

N.I.F.E.S. workers found many opportunities for raising the efficiency of process vessels. A jacketed crystallising pan was found to be wasting 300 lb. of steam whenever the water in the jacket was blown to drain; this could be prevented by fitting a thermostat. Thermal insulation of seven autoclaves, in another case, saved £110 a year.

Turbo-blowers and air compressors are often found to be working inefficiently because silencers or filters for the intake air are of the wrong size, or the filters have become choked. In one works, the pressure drop was cut by 10 in. w.g. by fitting new silencers with a saving of over £2,000 in one year.

Cooling water, run to waste from a condenser on a still was 3,170 lb./hr. at 188°F. Collection of this water for use a hot boiler feed saved £950 a year.

A.C.C. Strikers Return

After being on unofficial strike for five weeks about 33 fitters returned to work at the Urlay Nook chemical works, near Stockton-on-Tees. The men had claimed extra pay for 'dirty work' but their stoppage had not been approved by their union, the A.E.U.

Four New Common Names for Pesticides

FOUR new common names for pesticides have been approved by the Pest Control Products Industry Standards Committee and will be included in the revised British Standard 1831, due for publication at the end of 1960. The revised B.S. will include additional information on these products. In this list, the chemical names follow the common names:

Chromaphon: diethyl 6,7,8,9,10,10b-hexahydro-6-oxo-4a*H*-benzo(*c*)chroman-3-yl phosphorothionate; *OO*-diethyl *O*-(6,7,8,9,10,10b-hexahydro - 6 - oxo - 4a*H*-benzo(*c*)chroman-3-yl) phosphorothioate.

Endothal-sodium: disodium 7-oxabicyclo(2,2,1)heptane-2,3-dicarboxylate; disodium 3,6-epoxycyclohexane-1,2-dicarboxylate.

Fenthion: dimethyl- dimethyl 3-methyl-4-methylthiophenyl phosphorothionate; *OO-dimethyl O*-(3-methyl-4-methylthiophenyl) phosphorothioate.

Mercabam: *S*-(*N*-ethoxycarbonyl-*N*-methylcarbamoylmethyl) diethyl phosphorothiolothionate; *S*-(*N*-ethoycarbonyl-N-methylcarbamoylmethyl) *OO*-diethyl phosphorodithioate.

500 m. lb. World Nickel Sales Forecast

WORLD sales of nickel this year may reach a total of 500 million lb., compared with 435 million lb. last year, and should be at least 500 million lb. in 1961, according to Mr. J. R. Gordon, president of International Nickel Co. of Canada Ltd. Speaking at a press conference in London this week Mr. Gordon, who has been visiting the U.K. with Dr. John Thompson, honorary chairman of Inco, spoke of the achievement this year of the feeling that there was at least an adequate supply of nickel to meet world demand.

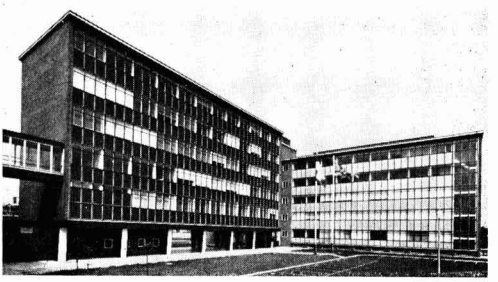
International Nickel's own sales of nickel last year totalled 317 million lb. and, according to Mr. Gordon, should reach about 350 million in 1960. As well as nickel from its own production, Inco is at present selling nickel from the U.S. Government stock. To Inco's production will be added the output of the new $125 million nickel mining and processing plant at Thompson, Manitoba, which has a scheduled capacity of 71 million lb./year, starting in 1961.

Further Expansion for William Boby

FURTHER expansion to the design, research and manufacturing capacity at Rickmansworth, Herts, is in hand by William Boby and Co. Ltd. A new laboratory extension, doubling capacity of the existing laboratory, is being built as is a new assembly shop. All the new development is to the rear of the main offices and the drawing offices, which were doubled in size earlier this year.

Boby's have also fitted-out a Dormobile with a special lifting plastics roof with laboratory equipment, bench, sink, etc., to act as a mobile laboratory for field work.

Ashburton Chemical Open New Laboratory Block at Manchester



Admin. building (left) and laboratory block

OPENING of the new laboratory, drawing office and administration building of Ashburton Chemical Works Ltd. at Trafford Park, Manchester, on 14 October marks the completion of an £800,000 group of buildings on which work began in July 1956. These buildings were planned to concentrate on one site offices, analytical and process development laboratories—as well as welfare facilities, for which a new building was opened in 1958. The laboratory and administration block was completed early this year.

Ashburton are one of the two manufacturing companies of the Geigy Group, which in addition comprises Geigy (Holdings) Ltd., two selling companies, and two smaller companies concerned with specialised research and development Ashburton Chemical Works, who started production in 1940, today employ some 800 people and the products manufactured include plasticisers and other chemicals for the plastics industry, pigment intermediates, textile chemicals, optical whitening agents, synthetic tans, chemicals for metal and water treatment, and pharmaceutical products.

The new buildings, including the welfare building, occupy a 2½-acre site adjoining the works. The administration building is placed at right angles to the welfare building and is a five-storey building raised over a *porte cochère* to afford a view over the garden at one side of the site. The laboratory wing is also five storeys.

Because of the high level of atmospheric pollution on the site, timber framed curtain walling has been used, which is glazed with spandril panels of Vitroslab. No metal has been used externally except for lead flashings, steel runways for window cleaning, and steel shutter and blast doors. To keep out atmospheric pollution, the buildings have no opening windows; filtered air is supplied from ventilation plant rooms. The main air filtration is by electrostatic precipitation. Central heating is provided from hot water radiators supplied from a central calorifier room, and is completely automatic in operation.

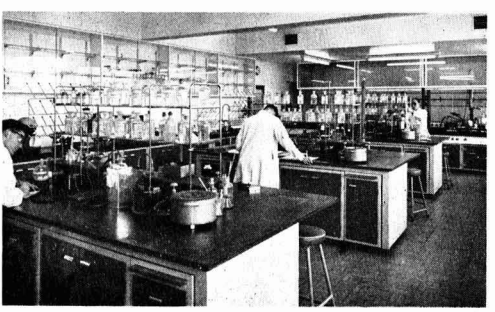
The three main laboratories each measure 42 by 25 ft. and are fitted with standardised, interchangeable furniture units. Each laboratory contains three island benches, which have teak tops with reagent racks on stainless steel supports and plastics-covered peg racks. In addition the laboratories are fitted with the maximum amount of window benches, which have specially glazed acid-resisting tiles. The wall bench is covered with black ferrolite tiles. Under-bench cupboard, drawer and bin units are retractable and are painted in two shades of grey Epikote resin paint. Drying cupboards for apparatus and products are placed underneath the fume cupboards and exhaust into them. A large wash-up sink with plastics-covered racks for drying apparatus, and high level storage cupboards with glass sliding doors, are further features of each laboratory.

In addition to the main laboratories there are a noxious processes laboratory measuring 21 ft. by 25 ft., an autoclave room of similar size and a semi-micro laboratory measuring 51 ft. by 25 ft. The laboratory also contains a large general chemical store and main sample store in the basement and a large conference room on the third floor, in addition to balance rooms, offices, etc.

Photo shows Mr. Reginald Maudling, President of the Board of Trade, cutting the tape at the entrance to the new buildings of Ashburton Chemical Co. Ltd., watched by the chairman of Geigy (Holdings) Ltd., Mr. E. G. Turner

The administration building accommodates the directorate, including a board room, and various offices as well as a large, well lighted drawing office with appropriate auxiliary offices. The welfare building contains the workers' cafeteria, providing for 800 in two sittings, and the staff restaurant and staff cafeteria to provide for 400 in two sittings, in addition to locker rooms, baths and showers, etc.

Main contractor for the new buildings was J. Gerrard and Sons Ltd., to whom Mancuna Engineering Ltd. (an associate of Sturtevant Engineering Co. Ltd.) were responsible for the provision of heating ventilating and fume extraction, in accordance with the instructions of the consulting engineer, Mr. J. Porges, M.I.Mech.E., M.Inst.F.



One of the development laboratories at Manchester

£500,000/Year for Cotton-rayon Research

ANNUAL expenditure of the new research organisation that will emerge following the merger between the British Cotton Industry Research Association and the British Rayon Research Association is likely to be about £500,000. Financial support from the industry will come mainly from a statutory levy collected by the Cotton Board, which initially is not likely to exceed £245,000. There will be an annual grant of about £70,000 from man-made fibre producers and a large annual grant from the Department of Scientific and Industrial Research.

About 100 scientists, technicians and other members of the staffs of the two associations will become redundant.

At the annual meeting of the B.C.I.R.A. last week Mr. John Lindley, chairman, expressed confidence in the successful outcome of the merger. The unified research efforts would, he said, make a timely and essential contribution to the reorganisation of the cotton trade that was now taking place.

N.C.L. Open Days

Investment in Basic Research Will Pay Dividends, says Director

SINCE its reorganisation two years ago there have been considerable changes of emphasis in the research programme being carried out at the National Chemical Laboratory. With the change of name from Chemical Research Laboratory and particularly under the direction of Dr. J. S. Anderson, who became director in October 1959, has come a reassessment of the work expected of a national laboratory of this type. The work being carried out falls into two categories. There is the objective fundamental research in fields which are not appropriate to universities in view of the systematic and often long-term approach required and which are not tackled by industry for similar reasons. In this respect the systematic determination of chemical thermodynamic data for organic and inorganic substances, has been enlarged involving as it has co-operation with many laboratories overseas.

The other type of research is concerned with work on problems which underlie many fields, for example that of corrosion. The inhibition of corrosion has up to now been largely empirical, but further results can be expected from a better understanding of the mechanisms involved, the study of which has long figured in the Laboratory's research programme.

Transition Period

Such a definite change in outlook and emphasis cannot be achieved overnight and the National Chemical Laboratory is naturally passing through a period of transition. For this reason the emphasis shown on the Open Days held at the Laboratory this week has been on progress for the future rather than on present developments.

Dr. Anderson stressed that a National Chemical Laboratory has an obligation to add something to fundamental knowledge as well as to produce results. A small investment in fundamental science in providing the interpretation of empirical data quickly pays dividends by avoiding a hit and miss type of procedure.

The work of the Laboratory is concentrated in groups (see CHEMICAL AGE, 23 July 1960). The New Materials Group is principally concerned at present with the investigation and development of polymeric materials with novel and useful properties. The topics shown on the Open Days were selected to represent developments in the study of thermally stable materials, in polymers with special electrochemical properties and in the characterisation of high molecular substances.

In the quest for materials for use as plastics stable at high temperatures, the Laboratory's attention has been concentrated on the possibilities of compounds of boron with nitrogen. Work has been carried out on the production of linear polymers by preventing the formation of the borazole ring (see also CHEMICAL AGE 15 October) and this work is the subject of patent applications. In this field, research has also been concentrated in the production of linear polymers with desirable properties from borazoles.

A new topic which was exhibited was the study of electron exchange polymers—compounds with reversible oxidation-reduction properties—which have many potential applications including the removal of dissolved oxygen from water, maintenance of anaerobic conditions in fermentations, preparation of hydrogen peroxide and the inhibition of peroxide formation in organic solvents. Various polymers based on the hydroquinone system have been prepared and fundamental studies aimed at improving their stability are being pursued. It has not yet been discovered how to control the length of the polymer chain but a number of trimers have been prepared which offer a promising field for research.

New developments of the gel filtration method of polymer fractionation, originated in Sweden, are being used at the National Chemical Laboratory. This method brings about the fractionation of polymers in a reverse order to that which might have been expected. It depends not upon the viscosity of the polymer but on the absorption of the compound into beads of the resin. The polymers of lower molecular weight are retained and the larger molecules pass through. Semi-permeable cellulose acetate membranes are capable of retaining molecules with a molecular weight as low as 1,500. The Swedish investigations were carried out on aqueous systems but the National Chemical Laboratory is working on non-aqueous systems, with their possible although not immediate application to the petroleum industry, by the use of polystyrene beads.

New 3M Device Cuts Hazards, May Make Radioisotopes More Popular

THE reluctance on the part of industry to embrace radioisotopes wholeheartedly arises from the number of hazards involved. However, a new radioisotope-containing product, developed by Minesota, Mining and Manufacturing Co. will, the manufacturers believe, increase the industrial uses and market potential of radioisotopes to a considerable degree.

The product, radiating micro-spheres, basically 'cages' radioisotopes mechanically and chemically in tiny spheres made of a special ceramic material. The composition of the ceramic is not revealed since patents have been applied for, but it is a material which does not absorb radiation, is chemically inert, extremely refractory and capable of forming a good bond with special, high temperature, inorganic adhesives.

3M say that the strength of the material coupled with the inherent strength of the spherical shape makes radiating micro-spheres practically indestructible. The properties of the ceramic and bond are such that the radioisotope cannot be dislodged, leached out or otherwise freed from its ceramic 'cage'. The spheres are difficult to destroy by fire, impact or explosion. This eliminates the possibility of accidental release of free radioactive materials from industrial appliances which, although almost unknown, is not impossible.

Proposed uses for the spheres include applications in self-luminous devices such as watch dials, instrument panels and control knobs, radiation sources for industrial gauges, process control devices and static eliminators, and medical sources for radiation therapy. 3M are seeking clearance from the U.S. Atomic Energy Commission, who have recently proposed to exempt tritium for watch dials from licensing. The firm is asking the A.E.C. to exempt promethium-147 for the same use and also radiation microspheres generally in uses where surface radiation does not exceed A.E.C. limits set for various appliances.

Static charge, a problem for many industries, is completely removed by radioactive eliminators, but the best radioactive materials for this use, alpha particles, have very low penetrating power so that the isotope should not be shielded. It must, however, be fixed firmly in place so that it cannot be removed and create a possible internal radiation hazard. The ceramic matrix of radiating micro-spheres allows most of the alpha-radiation to escape, say 3M, but at the same time can readily be secured to a suitable backing material with the proper binders.

New Bayer Anti-viral Drug is Man-made

A NEW anti-influenza drug, Virugon, which is thought to be the first man-made anti-viral drug commercially available, has been developed by Bayer Products. Discovered at the Karbi Research Institute in Sweden, the drug is said to reduce the length of an influenza attack from six to four days and to greatly reduce the susceptibility of people to 'flu. It is also said to be effective against mumps and measles.

Chemically, Virugon is based on the use of N-N-anhydrobis hydroxyethyl biguanide, and its action depends upon the establishment of a relationship between the virus and the cell.

EQUIPMENT NEWS

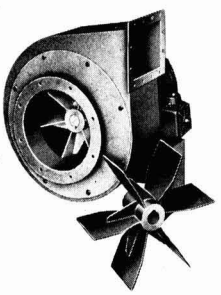
Chemical Plant: Laboratory Apparatus: Handling and Control Equipment

GENERAL PURPOSE STILL PACKAGED 100-litre capacity distillation units for use with steam or electrical heating have been introduced by **Q.V.F. Ltd.**, Fenton, Stoke-on-Trent. Charging and off-take can be by atmospheric or vacuum operation, while the reflux can be manually or electrically controlled.

The unit is a general-purpose still, of use to industry generally, and to technical colleges. It is available complete with structure and electrical contact gear. When water and vacuum services are connected, the unit is ready for operation.

Similar units of 50 and 20 litre capacity will be marketed shortly.

FUME/DUST EXTRACTION FANS THE Bellbro range of fume/dust extracting/blowing fan units, which are available in ½, ¾, 1 and 3 h.p. types, handle 650-1,800 c.f.m. with water gauge pressures up to 8 in. Compact, and fitted with universal



One of the Bellbro range of fume/dust fan units

casings, they enable the outlet discharge to blow in any direction and lend themselves to most layout schemes. Inlet and outlet are flanged and drilled for easy fixing to ducting, flexible piping, dust collector sleeves, etc.

Makers of these units are **Bellanger Bros. (London) Ltd.**, 306 Holloway Road, London N.7.

FLAMEPROOF DRUM HEATER SIMILAR in construction to the standard 15- and 45-gall. units, the new flameproof drum heater developed by the **Stabilag Co. Ltd.**, Mark Road, Hemel Hempstead, Herts, is split into two hinged halves, with sturdy locking devices to ensure the most intimate contact with the inserted drum. It is claimed that uniformity of heat distribution over the surface area of the drum ensures maximum efficiency, and obviates hot spots.

The heating element itself is nickel-sheathed, with flameproof glands of standard conduit size. The total loading of the unit is 3 kW, each half having a loading of 1½ kW. The standard maximum temperature is 450°F, though higher loadings can be provided to meet individual requirements. Temperature control is by means of a Statotherm energy regulator, which makes it possible to regulate to infinity the electrical input between 10%—100% of the rated consumption. The maximum load on the contacts is 10 amp., with a non-conductive load, and a very wide range of temperature settings is possible. The control unit itself is housed in a completely flameproof metal casing.

Base heaters, for use in conjunction with the flame-proof drum heater, are available at extra cost, with or without individual flameproof control.

OVERSIZE PARTICLE DETECTOR THE 'oversize particle detector' has been designed to detect whether process plant is producing its normal product in respect to fineness. For example, should a grinder screen become fractured the detector would immediately give a warning. The unit will likewise act as a 'policeman' and give warning of any increase in particle size of any product being produced in powder form.

A nylon brush sifts the sample material through a perforated screen back to the main stream; any overtails are deposited on to a hinged tray which operates a microswitch connected to the alarm. Only when oversize particles are present will the hinged tray come into operation. Detection of oversize particles is therefore announced almost as soon as they are produced, and the quantity of material containing these particles is reduced to the minimum. According to the makers, **W. S. Barron and Son Ltd.**, Gloucester, the unit can be used in a variety of applications.

POLYPROPYLENE TRAYS

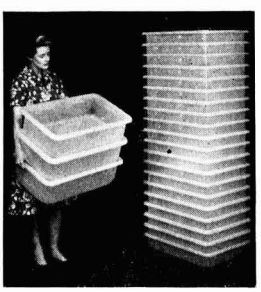
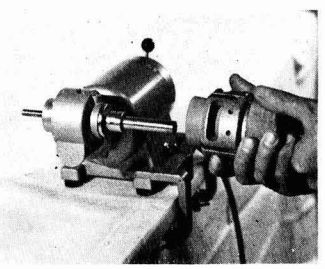


Photo shows the first two models in a standard range of polypropylene stacking trays. Dimensions are 24 in. × 14 in. × 6 in. deep and 24 in. × 18 in. × 3 in. deep internally, with the stacking medium incorporated in the profile of the wall. Advantages claimed for polypropylene in this application include heat resistance, rigidity with lightness, resistance to staining, etc. Makers of these trays are White Child and Beney Ltd., Shepley Works, Audenshaw, nr. Manchester

SMALLER LINATEX DIAPHRAGM PUMP A SMALLER, 1-in. version of their diaphragm pump, hitherto available only in the 1½ in. size, is being manufactured by **Wilkinson Rubber Linatex Ltd.**, Camberley, Surrey. Whereas the 1½ in. pump will handle 100-400 gall./hr., the new pump can operate in the range 30-120 gall./hr.

Design of the 1 in. pump is basically the same as for the larger unit, with a completely Linatex-protected pump body, a Linatex diaphragm and solid Linatex valves. The drive is made from a vertically mounted motor and gear box and stroke adjustment on the crank arm is provided.

MULTI-PURPOSE LABORATORY APPARATUS COMPACT and economical, the Multifix set of multi-purpose laboratory apparatus which is being marketed by the **Loughborough Glass Co.**, Loughborough, Leics, provides many of the services



Multifix motor, reduction gear and borer assembling being used for bung boring

regularly needed in laboratories, including magnetic and direct stirring, vacuum compression and liquid pumping, and cork boring. In addition the same basic apparatus can be adapted to provide sawing, drilling, grinding and polishing facilities—in other words it provides a miniature workshop as well.

Basis of the equipment is the Multifix motor, to which various attachments, such as reduction gear, a flexible gear, bung and cork borers, chucks, air pump, liquid pump, a grinding and sawing table, etc., can be fitted. An illustrated leaflet giving prices for these items is available.

Apart from its versatility, outstanding features of this apparatus are the infinitely variable speed of the motor (0-2,800 r.p.m. in either direction), the simple one-lever control for both forward and reverse action, and its high

torque at low revs. A support stand enables the motor to be mounted vertically or at an angle by means of a double socket mounting attachment.

The wide range of applications of this apparatus will be added to as further accessories are developed. Multiflex is expected to interest not only the smaller laboratory, which may lack facilities for all of its applications, but also the large laboratory whose existing services need backing-up by such a mobile reserve as Multiflex can provide.

HOPPER LEVEL INDICATOR

THE Magco level indicator for hoppers, bins and silos comprises a plain main casing carrying on the front a flexible diaphragm, the movement of which, by means of a push rod, operates a microswitch contained within the case. The indicator can be installed at an angle, when required, without internal adjustment. Single or double changeover switches are available for 5 amp. 230 v. A.C., 3 amp. 440 v. A.C. or lamp loads on 250 v. D.C. Electrical contact is made through the connecting box mounted on the rear of the main case.

According to requirements, the indicator can be arranged to operate a visual or audible warning, or both. When used in tandem, it can give automatic control of a filling cycle. Again, the 'switch' may be employed to raise or lower 'plows' in hoppers, in sequence with audible warnings to indicate operation of the 'plow.' It can also be used to indicate blockage in screw conveyors, elevators and chutes or to prevent damage to goods or conveyors from choking or jamming by the stopping of prior conveyors or feed units.

Makers of these units are **Magco Ltd.**, Lake Works, Porchester, Hants.

FLASH DRYING SYSTEMS

Now being introduced to this country for the first time are the Raymond flash drying systems used to remove definite amounts of moisture from damp, granular or fibrous material. The material is circulated in a hot, turbulent gas stream, causing the rapid transfer of heat and evaporation of moisture. When simultaneous drying and grinding is required, a disintegrator or pulveriser is included in the system. The finished product is separated, cooled and conveyed in a dust-free plant operating under suction, and its dryness and particle size may be accurately controlled. These systems can be used for materials including wet coal cake and sewage sludge, and also for the preparation of chemicals, foods and fertilisers. Suppliers of the equipment are **International Combustion Ltd.**, 19 Woburn Place, London W.C.1.

Flash drying systems are designed to accomplish drying under three distinct conditions: drying without disintegration, drying with disintegration, and drying and pulverising. The standard elements of the systems are given below; some systems require all the elements, while others may omit one or more of them.

Hot gas is supplied either by direct firing, indirect heating or the use of waste gas, and International Combustion furnaces operating on gas, oil, or coal, and heat exchangers are provided to meet these conditions. Several wet feeder arrangements are available, allowing the rate of feed to be changed as required. The mixer is used to condition the incoming wet feed by blending it with previously dried material. A product is thus obtained which can be easily picked up by the hot gas stream. A cage or impact mill is incorporated in the system when simultaneous drying and grinding is required. Wet material is fed into the hot gas stream and the mixture then enters the mill axially. The product leaves the mill almost completely dried but mixed with the gas. After passing through the uptake pipe, this mixture enters the cyclone collector, where separation occurs, and the moisture-laden gas is discharged to atmosphere through the vent fan. A bag filter, cyclone, or wet scrubber are sometimes included in the systems after the exhaust fan. The dry divider proportions the finished product when dry return is needed for conditioning the incoming wet feed. This proportioning device may be either manually or automatically controlled.

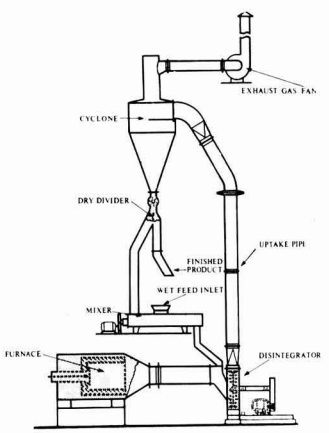
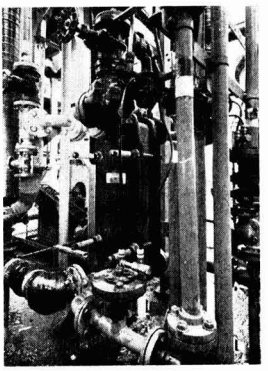


Diagram of a Raymond flash drying system used for drying with disintegration, showing direct oil firing, cage mill, mixer and dry divider

TITANIUM PLATE HEAT EXCHANGER



The use of titanium for the plates of plate heat exchangers is extending the use of this type of exchanger to highly corrosive liquids. An instance is the A.P.V. Paraflow of the bracket-mounted HXC type at the Murgatroyd Salt and Chemical Co. Ltd., Sandbach, Cheshire, shown above. It is used for cooling sodium hypochlorite liquor containing 14-15% of available chlorine by the circulation of 22% calcium chloride—both exceptionally corrosive liquids. The makers, the A.P.V. Co. Ltd., Manor Royal, Crawley, Sussex, state that the heat exchanger has shown no deterioration after several months run

COATINGS FOR HEAVY EQUIPMENT

APPLICATION of a range of anti-corrosion and protective coatings to heavy equipment up to 5 tons in weight, under factory conditions, is a service offered by **West's-Loyne Ltd.**, a company jointly formed by W.G.I. Ltd. (West's Group of Industries), engineers, of Manchester, and Loyne Ltd., protective coating specialists, of Ashton-under-Lyne. The new service is based on specialised plant recently installed at Norton Street, Miles Platting, Manchester.

Among the coatings applied are epoxy resins, phenolics, synthetic rubber, p.t.f.e., p.t.f.c.e., silicones, sprayed metal (zinc, aluminium, stainless steel) and flame sprayed coatings (polythene, nylon, p.v.c.).

The gas-fired oven at the new plant is 30 ft. by 12 ft. by 10 ft. high. A temperature of 450°C can be attained when needed for heat treatment of metal if required before p.t.f.e. coating. Provision is also made for curing coatings by hot air and infra-red heaters.

Other facilities available at the plant include the shot blasting of very large vessels in the open and the internal coating of pipes and ducting.

74,000-HOURS' MECHANICAL SEAL

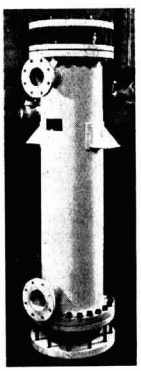
A MECHANICAL seal in service at the Shell Saint Gobain refinery, Petit-Couronne, France, has completed nine years' continuous operation, during which time it has completely prevented gland leakage from the Sigmund pump to which it is fitted. This is reported by the makers of the seal, **Flexibox Ltd.**, Nash Road, Trafford Park, Manchester 17. The pump in question—one of 35 Sigmund type K-N units—was recently taken off-stream for its first major overhaul, having originally being installed in July 1951. It has been handling liquid propane for 74,000 hr. at a temperature of 10.4°F, a discharge pressure of 13.5 p.s.i.g. and a suction pressure of 17.8 p.s.i.a. This is a particularly difficult sealing problem since propane has virtually no lubricating properties whatsoever. Its successful solution graphically illustrates that mechanical gland seals are capable of giving exceptionally long periods of trouble-free running.

The Flexibox seal used is a standard balanced type RRCQ. Provision is

made in its design for circulation of some of the pumped fluid around the seal faces in order to remove frictional heat and also to prevent any sediments that may be present from settling out.

PLASTICS BALL VALVE FOR CORROSIVES An all-plastics ball valve, for regulating the flow of corrosive liquids, has been introduced by **Barflo Ltd.**, 56 Cavendish Place, Eastbourne. It can be made from Kralastic (styrene/butadiene acrylonitrile), p.v.c., high impact p.v.c. (British Geon), and other suitable plastics materials in a full range of sizes. The design can be modified to suit specific needs.

GRAPHITE CARTRIDGE CONDENSERS The Chemical Engineering Division of **Powell Duffryn Carbon Products Ltd.**, Springfield Road, Hayes, Middx., have recently added a new graphite cartridge condenser to their range of Delanium graphite heat exchange equipment. The new condenser, designed to solve condensing problems involving corrosive vapours, has a cylindrical graphite element or 'cartridge' and is equipped with through holes along the major axes down which the condensing vapour passes. The service fluid passes in counter-flow through the annular space



A 90 sq. ft. Delanium graphite cartridge condenser produced by Powell Duffryn Carbon Products Ltd.

between the robust steel jacket and the slotted outer surface of the graphite cartridge. Carbon inlet and outlet heads complete the assembly.

The steel jacket may be lined with suitable inert materials if service fluids other than water are employed. Strong mounting lugs are provided which enable the unit to be easily and quickly installed on site by bolting directly to a wall or to a convenient steelwork.

The new condenser is being manufactured in a range of sizes from 4 to 90 sq. ft. and above.

TEMPERATURE INDICATOR-CONTROLLER A new electronic temperature indicator-controller is now available in the Bikini range of instruments for temperature measurement supplied by **Fielden Electronics Ltd.**, Wythenshawe, Manchester. Housed in a 6 in. dia. panel-mounting case it has a 13 in. scale calibrated in °C or °F (in any of 73 standard ranges for temperatures between −200°C and +850°C (−330° to 1,560°F). The control point is set by a pointer operated from the knob in the centre of the dial, while the indicating pointer is motor-driven from a servo-system. The instrument can be operated from 12 v. D.C. or the usual mains supply.

The platinum resistance measuring bulb used with the indicator-controller is housed in a stainless steel sheath of ¼ in. dia. and can be located at any distance up to 300 ft. away from the instrument. The control relay, which has contacts rated at 10 amp. to provide both changeover and 'normally open' switching, can be located up to 300 ft. or more distance from the instrument if required.

The makers claim a calibration accuracy of ±0.5% of the scale and a repeatability of 0.25°C on most ranges. Further details are available in specification sheet B.K.2/CA issued by the manufacturers.

BENCH ILLUMINATOR MAGNIFIER Plugged into the nearest electric light socket, the Ellisviewer bench illuminator-magnifier is ready for use. The hood in which is housed the two light bulbs, has an optically worked glass lens of 5 in. diameter and a magnification of 2½ times. It is not only adjustable on the main stand, for height and correct focus, but may also be tilted to any angle for perfect vision and steady illumination of the spot to be examined.

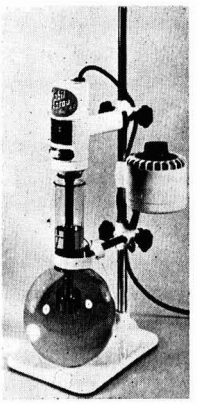
Made by **Ellis Optical Co.**, Mayday Road, Thornton Heath, Surrey, the magnifier is particularly suited to repetitive examination, although it can also be used for examining isolated objects. Price: £18.

PROCESS CHROMATOGRAPH DEVELOPED The Quality Control Division of **Elliott Brothers (London) Ltd.**, 34 Portland Place, London W.1, a member of the Elliott-Automation Group, market the new C.E.C. vapour phase process chromatograph, type 26-212. Designed for a wide range of applications, it is particularly suited for automatic closed loop control. It is claimed that a complete analysis of all hydrocarbons up to and including petenes can be achieved in 29 sec. with an accuracy of 1% of full scale. Up to eight streams can be automatically analysed in repetitive sequence. An over-ride switch is available for the analysis of any selected stream repetitively.

If a number of streams require analysis and these cannot all be performed with one column, it is possible to fit any additional columns which are automatically switched in when the streams for analysis are being passed to the chromatograph. This feature has been jointly developed with the Taylor Instrument Co., and enables a chromatograph to be used in a closed-loop control system for the first time. A successful installation has been carried out on a de-ethaniser tower in a Texas natural gas plant.

The following applications for monitoring or control using this new chromatograph are cited: alkylation, butadiene processing, natural gas and petrol production, ammonia synthesis, chlorine production, flue gas analysis, catalytic reforming, polymerisation, catalytic cracking, isomerisation, fractionation and reactor control, sulphur recovery plant control, chemical and petrochemical production, and blast furnace gas analysis.

SWISS-MADE HIGH FREQUENCY MIXERS Latest range of Swiss-made Polytron Kinematic high frequency mixers embodies several design improvements. It is claimed that, in the Polytron processing system, in addition to the normal forces associated with turbulence which influence the mixing process in conventional high speed propeller-type mixers, energy is released at a much greater intensity by cavitation at ultrasonic frequencies.



Model 10ST Polytron mixer

In the Polytron, sonic or ultrasonic vibrations are generated by means of a specially designed toothed rotor rotating within a coaxial toothed stator. High energy impulses are generated as the rotor teeth rapidly pass those of the stator; the number of impulses per revolution is determined by the product of the rotor and stator teeth. For example, the Polytron Model 35 ST with three teeth on the rotor and 12 on the stator generates 576,000 impulses/min. at 16,000 r.p.m. (equivalent to 9,600 cycles/sec.).

It is stated that no premixing is necessary with the Polytron, and that in many applications the high intensity of energy reduces the process time from several hours to a few minutes.

These mixers are supplied by **Scientific Furnishings Ltd.**, Poynton, Cheshire, who have a wide range of models available, from a micro apparatus for processing volumes of a few mls. of fluid up to production installations of 250 litres or more. Consistencies may vary from coarse particle or fibre suspensions down to low viscosity Newtonian fluids. In addition to the portable models, a range of fixed bench or floor mounted installations is available with integral mixing chambers.

Novel Moscow Mass-spectrometer Has Ion Source Based on Charge Exchange

FOR the second Humphrey Davy lecture, Professor V. N. Kondratiev, U.S.S.R. Academy of Sciences, spoke on 'Energy exchange in the interaction of particles under electric discharges' at a meeting of the London Section, Royal Institute of Chemistry, held on 12 October. Mr. E. LeQ. Herbert, R.I.C. president, was in the chair.

Mr. E. LeQ. Herbert (left) and Prof. V. N. Kondratiev at the R.I.C. meeting

After his introductory remarks, Professor Kondratiev described in detail a number of energy exchange systems and mentioned the contributions of British workers in this field.

Charge exchange was, he said, taken as a basis for the ion source of a novel mass-spectrometer type designed at the Institute of Chemical Physics, Moscow. Since under certain conditions spectra obtained by means of this mass-spectrometer are unilinear, or involve only few lines, this type is especially well adapted to analysis of free radicals (radical mass-spectrometer).

In discussing energy exchange processes in chemical interactions between ions and molecules it will be noted that all processes developing exothermally require no activation energy. Correspondingly activation energies for endothermic processes should be equal to heat effects of these processes. Moreover, cross-sections of the exothermic reactions studied will increase with decrease of ion energies (K).

The ready occurrence of exothermic ion-molecular reactions and the practical absence of endothermic reactions led to the development of a novel method for investigating the thermochemistry of ions, molecules and radicals. This method was used, in particular, for the determination of a most important value, the proton affinity of a number of molecules, and a table was shown giving the values obtained for a wide range of substances.

At the same time, as established recently excited atoms and molecules readily enter into reactions that proceed with energy release and are exothermic in the absence of excitation. It follows that the activation energy, in the form of electron excitation energy, is effective, as in the ionic charge transfer and in interaction of neutral particles.

Results of investigations in ion-molecular processes, their rates and thermochemistry permit new interpretation of the mechanism of radiation-induced reactions, reactions under electric discharge, heterogeneous catalysis and ionisation in high-temperature flames.

Mr. Herbert concluded the meeting by thanking Professor Kondratiev for having taken so much trouble in making the long journey to give so interesting a lecture.

Japan Pays £50,000 for G.E.C. Graphite Know-how

A LONG TERM agreement with the Nippon Electrode Co. Ltd., covering the manufacture in Japan of special types of graphite developed by G.E.C. laboratories for use in nuclear plant, has been signed by the General Electric Co. Ltd. Initially for a period of 10 years, the agreement is subject to the approval of the U.K. and Japanese Governments.

A capital sum of £50,000 will be paid by the Japanese company to G.E.C. under the terms of the agreement. In addition, G.E.C. will receive royalties on all sales; for the impermeable graphite the rate will be 10%, and for the low-permeability graphite the rate will be 7½%.

Two types of graphite are involved—one of low permeability and the other substantially impermeable. The low-permeability material is produced by impregnating normal graphite with a form of sugar. Impermeable graphite involves a novel method for building up the carbon structure. It is likely that these materials could be used outside the nuclear field, for instance in the chemical industry.

Under the agreement, G.E.C. will pass on to Nippon Electrode all information available on the processes and will assist the Japanese company to set up the necessary manufacturing plant. G.E.C. will provide technical staff to help with the building of the new plant and will undertake the training of Japanese engineers.

Nippon Electrode will be able to sell the two graphites made in Japan anywhere in the world with the exception of the U.K.

Coal Hydrogenation Poses Formidable Chemical Engineering Problems

COMPLETE gasification of coal as a means of producing town gas has been receiving increasing attention in recent years, and in the most suitable gas likely to be derived from future processes about ¾ of the heat units may come from methane. This means that unless methane can be obtained economically from coal, the part to be played by coal in gasification methods for town gas production may be severely limited.

In the British Coal Utilisation Research Association ninth coal science lecture on "The hydrogenation of coal to methane" Dr. F. J. Dent, director of the Midlands Research Station, reviewed the overall position and outlined the gas industry's researches aimed at solving the technical problems facing it in producing a sufficiently rich gas without resort to an enriching process based on oil, as is the case with the Lurgi process, at the present the most advanced available.

The high methane content of Lurgi gas arises from the reaction between hydrogen and coal substance in the fuel bed, i.e. from the straight hydrogenation of coal. Laboratory investigations have shown that there are two distinct phases in the attack of the hydrogen on the coal substance, the first occurring during the rise in temperature from 500°C when the coal molecules are unstable and yield volatile materials, and the second occurring when a final steady temperature is obtained, the coke residue then assuming some stability. Under optimum conditions of temperature and pressure, at least 85% of the coal can be hydrogenated to give a methane yield of 500 therms or more per ton of coal.

Experiments with fluidised beds led to the proposal that the process should be operated at 25-50 atmospheres in two stages. In the first operating at 800-850°C, the volatiles would be hydrogenated and in the second, 900-950°C, the carbon residue.

Valuable experience gained during work on the hydrogenation of oil had contributed to the design of a recently erected pilot plant for the hydrogenation of coal.

In conclusion, Dr. Dent admitted that formidable chemical engineering problems will have to be overcome, but held the view that successful incorporation of hydrogenation into a process to produce gas solely from coal should be possible.

Overseas News

SICILIAN GOVERNMENT MAKES CONDITIONS ON GELA PRODUCTION OF PETROSULPHUR

IN view of the fact that the Gela petrochemical plants of E.N.I. will produce sulphur at a time when the Sicilian sulphur industry is finding it difficult to market its output, the Sicilian Government is working out conditions that will be attached to the Gela concession.

These conditions are reported to involve the following obligations so far as E.N.I. are concerned.

(1) No elemental sulphur to be produced.

(2) Sulphuric acid obtained from recovered sulphur to be used on-the-spot or in other E.N.I. plants.

(3) A 'margin of tolerance' of 20% will be allowed as far as (1) and (2) are concerned.

These conditions will remain in force until a complete liberalisation of sulphur takes place in the European Economic Community.

Haifa Refineries to Make Polythene and Ethylene

A polythene plant, in addition to a unit for the production of ethylene, is to be constructed by Haifa Refineries. Tenders are out for the construction of the ethylene plant, but the polythene project depends on securing know-how.

Also in Israel, Fertilizers and Chemicals, Haifa, who are doubling their ammonia capacity to 20,000 tonnes/year, have recently started production of carbon dioxide.

Israel Mining Industries will start production at Sodom, of tetrabromethane in November. The plant was built under agreement with Baker Perkins Ltd., Peterborough. The Israeli firm has also developed a nitric acid route to phosphoric acid, which is being shared on a licence basis with Toyo Soda, Tokyo. Experimental production units are to be built at Sodom and in Japan.

U.S. Anti-trust Suit Against Cyanamid on Melamine

The United States Department of Justice has laid a civil charge under the country's Anti-Trust Acts against American Cyanamid Co. The charge concerns the alleged monopolisation of inland and world trade in melamine, the company having acted here in collaboration with six other concerns. These other firms—designated co-conspirators although no charge is being brought against them—are Ciba, of Basle, Ciba Products Corporation, British Industrial Plastics Ltd., British Oxygen Co. Ltd., Monsanto Chemical Co. and Soc. des Produits Azotes, Paris.

The Department of Justice claims that American Cyanamid, as the main producers of melamine in the U.S., monopolised the product over a number of years by the drawing up of illegal agreements with other companies. This was aimed at the exploitation of trading advantages gained from the patent licensing of the product and the exclusive control of the base material from which melamine is produced. Prices for melamine and melamine-based products had been kept disproportionately high, claims the Department of Justice.

Development of German Lube-oil Plant

An extensive development and modernisation programme is in hand at the Neuhof refinery, near Hamburg, of Oelwerke Julius Schindler GmbH, an associate company of British Petroleum Co. The refinery's main activity is the manufacture of high quality lubricating oils and specialities, and a major part of the project is the installation of an Edeleanu dewaxing unit for the production of high viscosity index lubricating oils. This plant, which will have a nominal capacity of 2,000 barrels per stream day, is expected to be commissioned during the first half of 1961.

The new dewaxer and the modernisation of other plant are estimated to cost £2.7 m. The capital of Oelwerke Julius Schindler was recently increased from DM7.5 m. to DM20 m. to provide additional funds for the development programme.

Chemstrand Plan Nylon Unit in Mexico

Chemstrand Corporation, in whom Monsanto hold a 50% interest, and are currently bidding for the remaining 50% (see p. 680), are to form a new company, through Chemstrand Overseas S.A., to produce nylon 66 yarn at a site near Mexico City. The plant is due on stream by the middle of next year. (Celanese Mexicana and Cellulose y'Derivados, S.A., have also announced plans to produce nylon 66 in Mexico.)

Airco to Triple Liquid Gas Output at Acton, Mass.

Built two years ago, Air Reduction Sales Co.'s $9 million liquid air separation plant at Acton, Mass. is to be expanded to meet the needs of electronic industry customers. Airco will triple plant capacity with an additional investment in production and distribution facilities of only $5.5 million, about 60%, thanks to a new engineering technique developed by the company. This technique involves utilising what was formerly cycle nitrogen by the addition of more dryers, refrigeration and caustic. Expanded capacity will be greater than 200 tons of liquid nitrogen, oxygen and argon per day, with nitrogen the primary product.

The extension will enable production of nearly 130 tons of nitrogen per day, compared with present production (nitrogen, oxygen and argon) of 75 tons/day. Electrolytic production of hydrogen at Airco's Acton plant will be increased 50%, to 7,500,000 cu. ft./month, to complement the nitrogen-oxygen-argon column expansion.

Shell Chemical's Large-scale Polyisoprene Plant on Stream

The first large-scale polyisoprene facilities in the U.S. came on stream early in October at the Torrance, Cal, plant of Shell Chemical. Capacity is set at 40 million lb./year. Shell are also building an 80 million lb./year plant near Marietta, Ohio, which is due in operation late in 1961.

Merck to Invest in Latin America

The U.S. Merck concern, Rahway, New Jersey, have an investment plan for their Latin American activities, involving expansion work costing some $1,350,000. In Mexico City a plant costing $1 million will be built to replace an existing production unit with 40% less capacity, while a new chemical plant will be erected at a cost of $350,000 in the Peruvian capital of Lima. Both new plants are expected to be ready for operation by the end of next year.

Bayer Raise Rubber Capacity, Announce New Elastomers

Farbenfabriken Bayer AG, Leverkusen, are to raise capacity for Perbunan C synthetic rubber to 25,000 tonnes/year. New polymers in the Perbunan N butadiene-acrylinitrile copolymer range are in preparation, the urethane elastomer Vulkollan is to be produced in increased quantities and from the end of 1960 considerable quantities of the peroxide-linked urethane elastomer Urepan E will be offered for sale.

Next year, new types of ethylene-vinyl acetate polymerisates will be produced, initially in technical quantities for use as thermoplastics or cross-linking elastomers.

Cabot's Carbon Black Plant on Stream at Ravenna

During October Cabot Italiana will start operating their new carbon black plant at Ravenna. Initial output has been scheduled at 15,000 tonnes/year. At present Italy consumes carbon black at the rate of 35,000 to 40,000 tonnes/year.

Cosynthetic Factor I Isolated by Lederle

A crystalline compound, called cosynthetic factor I, a key factor in the biosynthesis of 7-chlorotetracycline, has been isolated by Dr. P. A. Miller and his co-workers of Lederle Laboratories. The compound is obtained from *Streptomyces aureofaciens* mutant W-5 which cannot produce tetracyclines itself. When W-5 is grown with mutant S-1308 which makes very little 7-chlorotetracycline but

considerable 5a(11a)-dehydro derivative, S-1308 produces 2.8 g. of 7-chlorotetracycline per litre of culture as against 0.2 g. per litre when grown alone. Lederle have found that the active substance given off by W-5 is a catalyst rather than an intermediate.

Dutch Chemical Investments

According to a report of the Dutch Ministry for Economic Affairs, a total of Fl.920 million (some £90 million) has been invested in the Dutch chemical industry over the period 1957-1959. This compared with a total industrial investment over the period of Fl.5,950 million (about £580 million). Over the three-year period, 30 June 1957 to 30 June last some 20 subsidiary companies and 10 holdings were taken up in the country's chemical industry.

Du Pont's New Teflon Monofilament Fibre

Experimental quantities of a new Teflon monofilament fibre are now available from E. I. du Pont de Nemours. Previously only multifilament yarns of Teflon fibre have been on the market. The monofilament fibre may be bought for product evaluation, in experimental amounts, at a price of $35 per lb. It is available in two sizes: 250 denier (0.127 mm. d.) and 1200 denier (0.279 mm. d.). Also a 100 denier multifilament yarn, the lightest weight yarn yet produced of the material, is available for experimental use at $75 per lb.

Russo-Polish Natural Gas Line Planned

The erection of a long-distance natural gas pipeline has been agreed on by the Governments of the Soviet Union and Poland. The line will lead gas from the Western Ukraine to Poland to be processed there by the country's chemical and petrochemical industries. Poland is to supply the necessary equipment.

2,000 Tonnes/Year Dynamite Plant in Colombia

The Instituto de Fomento Industrial, working in co-operation with the Industria Militar San Cristobal, plans to erect a dynamite plant in Colombia. The unit will produce initially 1,500 annual tonnes, later to be expanded to 2,000 tonnes. The plant is planned to cost some Pesos 18 million (over £1 million).

Enjay Acetone Plant Complete

A new facility, designed to produce over 100 million lb. of acetone per year, has been completed by Enjay Chemical Co., U.S., a division of Humble Oil and Refining Co. The facility is situated at the Baytown refinery, N.J.

California Chemical Plan New Aromatics Venture

Following news of their joint British Petroleum venture to make aromatics at the Isle of Grain and Dinslaken (CHEMICAL AGE, 15 October, p. 623), California Chemical Co. state they will build a $17 million aromatics complex at the Richmond, Cal, refinery of their parent company, Standard Oil of California. Capacities are 41 million lb./year of *p*-xylene and 100 million lb./year of *o*-xylene. The plant is scheduled for completion late next year or early in 1962.

U.S. Tariff Hearing on Ultramarine Blue

Following recent representations on imports of ultramarine blue (CHEMICAL AGE, 6 August p. 204), the U.S. Tariff Commission is to investigate under the 'escape clause' procedure imports of ultramarine blue and wash and all other blues containing ultramarine, classifiable under paragraph 68 of the Tariff Act, 19 1930. A public hearing will open at 10 a.m. on 17 January next in Washington, D.C.

The only producers of ultramarine blue pigment in the U.S. are Standard Ultramarine. U.S. imports rose from 702,000 lb. in 1953 to 3 million lb. in 1959.

Goodyear Launch New Polyester Fibre in U.S.

Vycron, latest man-made fibre announced by Goodyear Tire and Rubber Co., Akron, Ohio, U.S., is claimed to provide unusual resistance to pilling in knitted fabrics, so providing better looking and better lasting clothes. It is produced from Vitel Polyester resin, developed by Goodyear, which is taken in pellet form by the Beaunit Mills textile company for processing into the fibre and for weaving into fabrics.

Phillips to Enter High-purity Benzene Field

The third U.S. oil company to announce its entry into petroleum-based high-purity benzene in recent weeks, Phillips Petroleum Co. are to build a 22 million gall./year plant at the Sweeny refinery, Texas. The plant will be in production by the middle of 1961. Mobil Chemical are to build a 30 million gall./year plant at Beaumont, Tex, while Plymouth Oil plan a 15 million gall./year plant at Texas City.

Rumianca to Produce Plastics Under U.S. Rubber Licences

The Rumianca chemical concern, Turin, have signed an agreement with the U.S. Rubber Corporation under which the U.S. company will erect a plant at Pieve di Vergonte, Italy, where Rumianca will start the licenced production of U.S. Rubber plastics. Initial annual capacity is given as 10,000 tonnes, sales to be made both inside Italy and to other European Economic Community countries.

Deca and Pentaborane Available in U.S.

Laboratory quantities of two boron hydrides—decaborane and pentaborane—are now available for experimental work from the Olin Mathieson Chemical Corporation, New York. Prices depend on the quantity purchased, ranging from $223 to $320 a lb. for decaborane and $157 to $357 a lb. for pentaborane.

Italy to Buy Soviet Oil in Exchange for Steel Tubes and Rubber

IN the past week, plans have been announced involving the Italian purchase of Soviet oil in exchange for steel tubes and synthetic rubber; the building of two new refineries, one for Esso; expansion of existing refineries; and new petrochemical plants.

E.N.I. have contracted to purchase import 12 million tonnes of Soviet petrol within the next four years, more than doubling existing imports. To be carried in Italian tankers from Black Sea ports, it will account for some 17% of Italian oil imports. Signor Mattei, head of E.N.I.-A.G.I.P., the Italian state group, believes that when Soviet pipelines now under construction are extended to Baltic ports, the U.S.S.R. will capture the whole north European oil market.

In return for oil shipments to Italy, the U.S.S.R. is buying through A.N.E.N.I.-A.G.I.P. 240,000 tons of steel tubes up to 48 in. diameter for oil and gas pipelines and 50,000 tons of synthetic rubber. Value of the contract is put at $200 million. (See 'Project News', p. 663).

New Refineries. The Italian petroleum commission has approved two applications for the building of two refineries. Esso Italiano have been authorised to build a refinery at Pavia with a 3 million tonnes/year capacity, plus a 30% reserve capacity. Later the company will be allowed to raise capacity to 4 million tonnes, plus a 30% reserve. This refinery will be linked by pipeline to a coastal depot at Vado Ligure. Another refinery (1 million tonnes/year) will be built by Soc. Saica at Porto Torres, Sardinia.

Expansion Approvals. Anonima Petroli Italiana have been given permission to raise refinery output at Falconara from 1.35 million tonnes/year, to 2.3 million tonnes, plus a reserve of 30%; Sarom at Ravenna will raise capacity from 2.5 million to 4 million tonnes/year, plus reserve; Garrone will raise their Genoa capacity from 1,495,000 tonnes to 3.3 million tonnes/year, plus 30% reserve; Aquila in Trieste from 900,000 tonnes to 1.5 million tonnes/year, plus 30% reserve; Rol at Viguzzolo, specialising in lube-oils, from 50,000 tonnes to 250,000 tonnes, plus 30% reserve.

In addition, Soc. Sarda Industrie Resine, Sassari, Sardinia, have approval to build a petrochemical plant at Porto Torres with a capacity of 1.2 million tonnes/year; in addition to their Ravenna plants, A.N.I.C., will install a unit to produce butadiene from butane (about 14,000 tonnes/year); Vincor, at Trieste, will build a plant for the recovery of spent lube-oils (19,000 tonnes/year); Cobena, a similar plant at Galbiate (12,000 tonnes/year); and Elga, a lube-oil plant at San Dorlingo della Valle, near Trieste.

SCIENTIFIC RUSSIAN WITHOUT TEARS

Part 4—Sentences

By Professor W. J. Perry.

(University of Arizona, Tuscon, Arizona, U.S.)

RUSSIAN and English sentences, in their construction, have much in common. This instalment, however, will focus attention on differences rather than on similarities. The purpose is to show that such differences constitute no insurmountable barrier and to indicate how such differences may be tackled successfully.

It is true that, in scientific and technical writing, the replacement of successive words in Russian sentences by their English counterparts usually provides considerable insight into the subject content.* A less restricted and more satisfactory degree of understanding requires that grammar as well as vocabulary be taken into account. Here the Russian endings require particular attention—at least as far as those of us who speak and read English are concerned.

As already noted, nouns and adjectives have parallel—though dissimilar—sets of endings, so that adjectives—and other noun modifiers—are, as a rule, brought into agreement as to gender, number and case with modified nouns.

In example sentences, the numerals 1-6 will be written after nouns to indicate respectively the nominative, genitive, dative, accusative, instrumental and prepositional cases. With adjectives the numerals 1a-6a will be used for the same purpose.

Beside the nominative case, already considered previously, two other cases are unlikely to cause much difficulty. The accusative case is used principally as the direct object of transitive verbs and after certain prepositions. This case is also used to denote extent of space or time, or point in time, and in certain idioms of minor importance. The endings are for the most part the same as for the corresponding nominative. The majority of feminine nouns that have either -y or -ю as accusative singular ending are the most frequently encountered exceptions. The prepositional case, as its name implies, is used only after prepositions—though not after very many of them. Here are the prepositional endings.

Nouns	*Singular*	*Plural*
All genders	-е, -и (Rarely -y or -ю, masc. and neuter only)	-ах, -ях
Adjectives	*Singular*	*Plural*
Masc. Neuter	-ом, -ем,	-ых, -их
Feminine	-ой, ей	(All genders)

*See, for example, Chapter 11 in 'Machine Translation of Languages', edited by W. N. Locke and A. D. Booth, John Wiley and Sons, New York, 1955.

Now for simple sentences exemplifying the use of the accusative and prepositional cases.

При высоком (6а) давлении (6) *метан (1)
At high pressure methane
превращается в жидкость (4).
converts self into (a) liquid.

На солнце (6) *атомная (1а) *энергия (1)
In (the) sun atomic energy
выделяется в громадных (6а)
evolves self in enormous
количествах (6).
amounts.

В котлах (6) тепло (1) превращает воду (4)
In boilers heat converts water
в пар (4).
into steam.

*Газ (1) выходит через
(The) gas goes out through
*специальные (4а) газоотводы. (4)
special gas outlets.

Звуки (1) разделяются на
Sounds divide self into
*музыкальные (4а) *тоны и шумы (4).
musical tones and noises.

Водные (1а) растворы (1) *аммиака (2)
Aqueous solutions of ammonia
окрашивают лакмус (4) в синий (4а)
colour litmus in blue
цвет (4).
colour.

Поршень (1) каждый (4а) раз (4)
(The) piston each time
возвращается в первоначальное (4а)
returns self to (the) original
положение (4).
position.

The dative case is formed with the following endings:

Nouns	*Singular*	*Plural*
Masc., Neuter	-у, -ю	-ам, -ям
Feminine	-е, -и	(All genders)
Adjectives	*Singular*	*Plural*
Masc., Neuter	-ому, -ему	-ым, -им
Feminine	-ой, -ей	(All genders)

The dative case quite often requires 'to' for its translation, especially when it is used as an indirect object or with various words having implied prepositional meaning and in certain idiomatic expressions. On the other hand, 'to' is usually not required when the dative is used after certain prepositions or as the direct object of a few verbs. The following sentences exemplify some of the more commonly encountered situations. (Note

underlining to direct attention to words in the dative case.)

Многие (1a) *ацетаты (1) легко
Many acetates easily
подвергаются *гидролизу. (3)
submit self (undergo) hydrolysis.

В настоящее (4a) время (4) *химики (1)
In (the) present time chemists
приписывают *энзимам (3)
ascribe to enzymes
*каталитический (4a) *характер (4).
catalytic character.

Такая (1a) *машина (1) противоречит
Such (a) machine contradicts
второму (3a) закону (3) *термодинамики (2).
(the) second law of thermodynamics.

Существование (1) *атомов (2) не
(The) existence of atoms not
подлежит сомнению (3).
is subject to doubt.

При постоянной (6a) *температуре (6)
At constant temperature
объем (1) данной (2a) *массы (2)
(the) volume of (a) given mass
*идеального (2a) *газа (2) изменяется
of (an) ideal gas changes self
обратно *пропорционально давлению (3).
inversely proportionally to (the) pressure.

К общей (3a) *группе (3) драгоценных (2a)
To (the) general group of precious
*металлов (2) принадлежат *платина (1)
metals pertain platinum
и *палладий (1).
and palladium.

По внешнему (3a) виду (3),
With respect to external appearance,
*графит (1) сильно отличается от
graphite strongly differs self from
алмаза (2).
diamond.

Каучук (1), подобно *изопрену (3) и
Rubber similar (to) isoprene and
другим (3a) непредельным (3a)
other unsaturated
углеводородам (3) присоединяет *бром (4).
hydrocarbons takes up bromine.

Finally, we come to the instrumental case which is formed with the following endings:

Nouns	*Singular*	*Plural*
Masc., Neuter	-ом, -ем	-ами, -ями
Feminine	-ой (-ою), -ей (-ею), -ью	(All genders)
Adjectives	*Singular*	*Plural*
Masc., Neuter	-ым, -им	-ыми, -ими
Feminine	-ой, -ей	(All genders)

Formation of the instrumental case follows the same pattern as the other cases. Some of its uses, however, may seem rather strange at first. As the name implies, it may be used to designate the means or agency for accomplishing something—the concept of instrumentality being stretched rather far sometimes. The instrumental case is also used as the object of various verbs and prepositions and in various idiomatic expressions. Important examples of the latter include use with various verbs that denote existence, location or the like. The following sentences may serve to indicate the varied role of the instrumental case—here underlined.

При таких (6a) опытах (6) наблюдается
In such experiments observes self
отклонение (1) альфа-частиц (2)
deflection of alpha particles
*электрическим (5a) полем (5).
by (an) electric field.

При обыкновенной (6a) *температуре (6)
At ordinary temperature
*метан (1) не окисляется кислородом (5)
methane not oxidises self by (the) oxygen
воздуха (2).
of (the) air.

Можно извлекать уксусную (4a)
(It is) possible to extract acetic
кислоту (4) из водных (2a)
acid from aqueous
растворов (2) обработкой (5)
solutions by treatment
растворителями (5), например,
with solvents, for example,
*эфиром (5).
ether.

При поджигании (6) *метан (1) горит
On ignition methane burns
бледным (5a) *пламенем (5).
with (a) pale flame.

*Метан (1) образуется различными (5a)
Methane forms self by different
способами (5).
processes.

*Кристаллизация (1) делает стекло (4)
Crystallisation makes glass
полупрозрачным (5a).
semi-transparent.

Натрий (1) легко режется ножом (5).
Sodium easily cuts self by (a) knife.

Сахар (1) обладает сладким (5a) вкусом (5).
Sugar possesses (a) sweet taste.

За *Ураном (5) находятся *планеты (1)
Beyond Uranus find self planets
*Нептун (1) и *Плутон (1).
Neptune and Pluto.

С кислородом (5) *метан (1) образует
With oxygen methane forms
взрывчатую (4a) смесь (4).
(an) explosive mixture.

*Ароматические (1a) углеводороды (1)
Aromatic hydrocarbons
являются *неполярными (5a)
shows self (are) non-polar
соединениями (6).
compounds.

Воздух (1) является смесью (5)
Air shows self (is) (a) mixture
*газов (2).
of gases.

(Continued on p. 681)

PEOPLE in the news

● **Dr. James Craik, M.A., B.Sc., Ph.D.,** chairman of the I.C.I. Nobel Division since 1955, is to retire on 31 March 1961. He will be succeeded by **Dr. John M. Holm,** a joint managing director of the Nobel Division. Dr. Craik joined I.C.I. in the Ardeer research laboratory in 1927 and after experience in research as well as production and development he was elected to the division board in 1948 as home sales and distribution director. He became a managing director in November 1952. Dr. Holm joined the Ardeer research staff in 1934 and during the war became Director of Explosives Production with the Ministry of Supply. He was elected to the division board in 1953 and has held his present post since 1958.

● **Mr. Lucas Atkinson, F.C.A.,** and **Mr. Arthur King** have been appointed to the divisional board of Winthrop Laboratories, division of Winthrop Group Ltd. at Newcastle upon Tyne.

● **Mr. E. Humphrey Browne, C.B.E.,** deputy chairman of the National Coal Board, has been appointed a director of the National Industrial Fuel Efficiency Service.

● **Lieut.-Col. John Montresor,** who has served with the Royal Engineers for 28 years, has been appointed to take charge of the Printing, Packaging and Allied Trades Research Association's package testing and inquiry laboratory. Col. Montresor has had wide technical experience both in research and development work connected with Service projects and in the packaging of War Department stores.

● **Mr. Charles Andrews** joined the National Chemical Laboratory in September 1927, as the first laboratory assistant, has received the British Empire Medal from Lord Hailsham, Minister for Science. Now chief glassblower at the N.C.L., in the early days he assisted in research on low-temperature tars, but later developed a marked aptitude for glassblowing. He was made responsible for all the laboratory's glassware, including the construction of new apparatus of special design, 13 years ago. Such is his skill that he has been asked to make special apparatus for many other D.S.I.R. laboratories.

H. A. White, assistant managing director of Hercules Powder Co. (see C.A., 8 October)

● **Mr. K. Bradshaw** has taken over from **Mr. J. C. Whelan** as Shell Chemical Co. representative for the sale of detergent products in the Bradford area of Yorkshire. Mr. Whelan has taken up a new appointment at the company's northern sales region offices in Manchester. Mr. Bradshaw has moved from head office, London, where he was a technical assistant in the general chemicals department.

● **Mr. A. E. Richards** has been appointed managing director of Universal Matthey Products Ltd., the joint subsidiary of Universal Oil Products Co. and Johnson, Matthey and Co. Ltd., formed in 1953 to meet the needs of the petroleum and petrochemical industries for catalysts.

● **Mr. Frederick Morrice** has been appointed secretary of Evans Medical Ltd., Liverpool, in succession to the late **Mr. Laurence Chrimes.**

● **Dr. P. Bruck, B.Sc., Ph.D.,** has been appointed I.C.I. research fellow in the Chemistry Department, Hull University, and **Dr. A. Richmond, B.A., D.Phil.,** has been appointed a research fellow in the same department.

● **Mr. David B. Ardern,** director of technical service at Houdry Process Corporation, will be one of three executive directors of Katalysatorenwerke Houdry-Huels, GmbH, the new joint company formed by Houdry and Chemische Werke Hüls AG, to develop, manufacture and sell catalysts in West Europe. In addition, Mr. Ardern will act as Houdry's process sales representative in Europe. Hüls will appoint two executive directors to the new company.

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

● **Mr. Robert Alexander** has been appointed secretary of Scottish Agricultural Industries Ltd., Edinburgh, following the retirement of **Mr. W. J. Ramsay.**

● **The Duke of Edinburgh** has accepted an invitation to become Patron of the Society for Visiting Scientists. The Society provides club and restaurant facilities, with overnight accommodation, at 5 Old Burlington Street, London, W.1, for the benefit of overseas scientists visiting the U.K.

● **Dr. I. J. Faulkner,** ammonia works manager of I.C.I.'s Billingham Division, will attend the annual meeting of the Ceylon Association as official delegate of the British Association. Leaving the U.K. on 20 November, with his wife, Dr. Faulkner will give talks on the growth of the Billingham chemical site and on the production of ammonia. Billingham will also be the subject of a 20-minute broadcast over Ceylon radio. After a 14-day stay in Ceylon, Dr. Faulkner will visit India at the request of I.C.I. India for technical talks.

● **Professor Dr. Heinrich Zollinger,** of the Zurich State Technical College, has been awarded the Swiss Ruzicka Prize for 1960 for his work in the field of colour chemistry and his research into the mechanisms of substitution reactions and dyeing processes.

● Two directors of Laporte Industries Ltd. were among those who received long service awards from the chairman, **Mr. P. D. O'Brien,** at a 25-year club meeting at Luton on 11 October. **Mr. V. W. Slater,** director, and chief chemist of L.I.L., was one of seven new '40 year' men who received a cheque from Mr. O'Brien. The others were S. A. Horstman (Warrington), W. L. Crook

V. W. Slater

B. E. A. Vigers

(Luton), T. Annes (Leicester), and R. H. Bowring, J. R. Hill and A. Lucas (London). **Mr. B. E. A. Vigers,** L.I.L. technical director, and deputy chairman, was one of eight new '25 year' men to receive a gold watch. Others included four Luton process workers, H. S. Young, T. S. Maugham, N. Sutherland and E. Jones as well as C. H. Clennett, J. Graham and A. Campbell, also of Luton. Mr. O'Brien, who was fulfilling his last engagement before leaving on a world business tour two days later, welcomed his father, **Mr. L. P. O'Brien,** president of Laporte Industries. (See also 'Distillate', p. 662.)

● **Mr. Arthur W. Williams, B.Sc., A.I.M.,** has been appointed chief technical representative in charge of the technical sales service department of Booth Aluminium Ltd., Argyle Street Works, Birmingham.

● **Mr. D. W. Payn** will resign as general manager and secretary of the Lead Development Association with effect from 31 December.

● Two members of the Institute of Packaging elected to the judging panel of Eurostars 1960, an international packaging competition, are: **Mr. F. A. Paine, B.Sc., F.R.I.C.** (Bowater Research and Development Co. Ltd.), and **Mr. Edward Richardson, M.A., B.Sc.** (Boots Pure Drug Co. Ltd.). Eurostars is a package design competition, organised by the European Packaging Federation.

Commercial News

- Boots Plan One-for-one Free Scrip Issue
- Dunlop Margins Hit By Rising Costs
- Laporte Pay same on Higher Capital
- Monsanto Buy Viscose's Chemstrand Stock

Boots Pure Drug

A free scrip issue of one-for-one ordinary share will be proposed at an extraordinary general meeting of Boots Pure Drug Co. Ltd, to be held in Nottingham on 22 November. The issue involves capitalising £12.8 million from capital reserves; the capital reserve of £7,780,720 is being increased by some £5,771,000 following the capitalisation of reserves in five retail subsidiaries.

An interim of 8% is declared in place of two interims, each of 3%. The increase will reduce the disparity between interim and final.

Dunlop Rubber Co.

Group sales of the Dunlop Rubber Co. Ltd. for the first half of 1960 were £136 million (£127 million), with a pre-tax trading balance of £6.75 million (£6.34 million) and a net profit of £3.29 million (£3.15 million). Interim dividend is maintained at 4d. per 10s. unit.

Since June, turnover has been maintained, but margins are being influenced by the higher cost of natural rubber and by wage increases. Business will be affected by the motor industry conditions and profits for July-December are not likely to reach those of the second-half of 1959, on present estimates they should be about the January-June 1960 level.

Laporte Industries

At a board meeting of Laporte Industries Ltd., on 17 October, it was resolved to pay on 1 December 1960, an interim on the issued ordinary of 3% for the year ending 31 March 1961. The 1959 interim was 3% on issued capital of £8,757,600; the present dividend is payable on issued capital of £11,822,760 due to the increases following the one-for-five-bonus issue in April 1960 and the capital rights issue of one-for-eight made in August 1960.

Chemstrand Corporation

Negotiations have been put in hand for the acquisition by Monsanto Chemical Co., St. Louis, and American Viscose Corporation, Philadelphia, for the acquisition by Monsanto of the 50% Viscose holding in the Chemstrand Corporation. At present Monsanto jointly own Chemstrand with American Viscose, whose holding will be worth an estimated $9.5 million when the plan is effected. Under the plan, Viscose would receive 3,540,000 Monsanto common stock shares which would be subject to special voting provisions as long as they are held by Viscose. Viscose have no intention of distributing or disposing of the Monsanto shares at present.

Before the acquisition takes place, Chemstrand will pay their usual $5 million dividend, half of which will accrue to Viscose. The proposals are subject to the approval of both Viscose and Monsanto shareholders.

After the acquisition, Chemstrand will continue as a separate entity. The world's second largest producer of synthetic fibres, Chemstrand have a U.K. subsidiary, Chemstrand Ltd., with an acrylic fibre plant in Coleraine, Northern Ireland. Monsanto Chemical Co. have a fully owned U.K. subsidiary in Monsanto Chemicals Ltd.

Chemische Werke Schön

The Harburger Chemische Werke Schön und Co. AG, a full subsidiary of the London company, Wall and Lead Industries Ltd., announce a net profit of DM160,000 (1959: DM 120,000) for the 1959 financial year. A dividend has yet to be announced.

Union Chimique Continentale

Union Chimique Continentale, a French subsidiary of the Frankfurt-on-Main chemical producers, Farbwerke Hoechst AG, announce plans to raise their capital from N. Fr.833,000 to N. Fr.1 million. A further Hoechst subsidiary in France, Polysynthese, will double present capital to a new level of N. Fr.1.2 million.

Leiner-De Mulder

A new company in the field of animal waste products, Leiner-De Mulder Ltd., has been formed by a merger of a division of P. Leiner and Sons Ltd., Treforest, and a division of Prosper De Mulder Ltd., Doncaster, where the new firm will be based. Prosper De Mulder are one of the four leading U.K. renderers, while Leiner are the world's largest ossein gelatin producers. Leiner-De Mulder will degrease animal bone and manufacture meat and bone meal and tallows. Operations are to start at once.

NEW COMPANIES

DOMESTIC DETERGENTS LTD. Cap. £2,500. Manufacturers of and wholesale and retail dealers in detergents, soap powders, etc. Directors: B. Green and I Green (directors of Berkeley Perfumery Co. Ltd., etc.). Reg. office: 53 Queen Anne Street, London W.1.

JOHN HENSHAW AND CO. LTD. Cap. £1,000. Manufacturers of and dealers in soap and washing materials, oils and greases, oil extractors, etc. Directors: W. C. Evans and D. A. Evans. Reg. office: Bright Road, Eccles, Lancs.

LAXTON AND JONES (CHEMISTS) LTD. Cap. £10,000. Manufacturing, pharmaceutical and dispensing chemists, etc. Directors: L. C. Laxton and Mrs. D. F. Laxton, B. M. M. Jones and Mrs. F. L. Jones. Reg. office: Crabtree Close, Picket Hill, Ringwood, Hants.

WILFRED SMITH (FINE CHEMICALS) LTD. Cap. £1,000. Manufacturers of and dealers in chemicals, gases, waxes, oils, etc. Directors: C. D. L. Smith, B. R. Cuzner. Reg. office: 16 Philpot Lane, London E.C.3.

Market Reports

GOOD DEMAND FOR NAPHTHALENE

LONDON Active trading conditions have been reported from most sections of the industrial chemical market and the movement against contracts, in the aggregate, has been fairly substantial. Export inquiry continues on a satisfactory scale.

Prices for the most part are unchanged and steady. Business in fertilisers has been moderate with little of fresh interest to record.

Firm conditions continue throughout the coal tar products section. Naphthalene is meeting with a good demand and refined tar is moving well on home account and for shipment.

MANCHESTER A fair number of inquiries covering a wide range of products has been reported during the past week, many of them relating to deliveries over the early months of next year. Contract deliveries of the alkalies and magnesium and ammonia compounds as well as of most other descriptions are going forward steadily to home industrial consumers and the overseas movement of supplies is reported to be on a reasonably satisfactory scale. As regards prices the general undertone is steady and there have been few movements either up or down.

GLASGOW The general range of industrial chemicals has been very well demanded during the past week and in particular from some sections of the textile industry a fairly active position has prevailed. As far as quantities are concerned, these have been well maintained against spot and contract requirements in both cases, the question of delivery has been an important factor. Prices have remained reasonably firm apart from some variations.

The export position has remained unchanged with, as reported last week, still some delays due to the present hold up in shipping.

NEW PATENTS

By permission of the Controller, HM 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 23 November

Process for the manufacture and recovery of chlorendic anhydride. Hooker Chemical Corporation. **854 509**

Crystalline butadiene polymers and process for producing them. Montecatini. **854 615**

Preparation of methyl β-cyanoisobutyrate. Rohm & Haas Co. **854 923**

Production of organic acid esters of cellulose. Celanese Corporation of America. **854 993**

Detergent compositions. Gillette Co. **854 994, 854 995**

Apparatus for producing ozone. Chlorator GmbH. **854 616**

Process for the preparation of organodichloroboranes. Olin Mathieson Chemical Corporation. **854 924**

Phosphatide emulsifying agents. Armour & Co. **854 925**

Monoisopropylaminoborane polymers. Olin Mathieson Chemical Corporation. **854 947**

Process of controlling catalytic cracking of diarylalkanes. American Cyanamid Co. **854 617**

Process for the production of heterocyclic carboxylic acids of the pyrazole series, as well as their esters and salts. Geigy, AG, J. R. **854 950**

Photographic film base material. Montecatini. **854 649**

Alkylated indanols. Goodrich Co., B. F. **854 976**

Polyglycol ethers. Farbenfabriken Bayer AG. **854 952**

Manufacture of halogenated organic compounds. Svenska Oljeslageri A.B. **854 977**

Purification and recovery of normally solid polymers. Standard Oil Co. **854 531**

Process for the production of symmetrical and unsymmetrical azo compounds. Agfa AG. **854 955**

Aromatic sulphonylamino compounds containing trifluoromethyl radicals. Farbenfabriken Bayer AG. **854 956**

Electroluminescent phosphors and the preparation thereof. Westinghouse Electric Corporation. **854 683, 854 684**

Polymerisation of chloroprene. Farbenfabriken Bayer, AG. **854 979**

Photopolymerisable compositions and their uses. Du Pont De Nemours & Co., E. I. **854 980**

Triazo dyestuffs and their preparation. Yorkshire Dyeware & Chemical Co. Ltd., and Wilson, D. C. **854 957**

Copolymerising monoepoxides with tetrahydrofurane. Farbenfabriken Bayer, AG. **854 958**

Pyrimidine compounds and means of producing same. Parke, Davis & Co. **854 959**

Isomerisation of paraffinic hydrocarbons. Esso Research & Engineering Co. **854 602**

Reaction products of epoxidised oils. Boake Roberts & Co. Ltd., A. **854 961**

Water-soluble reactive dyestuffs. Imperial Chemical Industries Ltd. **854 962**

Complex ester compositions and process for their manufacture. Geigy Co. Ltd., and British Petroleum Co. Ltd. **854 673, 854 963**

Method for the preparation of organo metallic compounds. Associated Lead Manufacturers Ltd., and Lewis, F. B. **854 776**

Polymerisation of a hydrocarbon gas containing propylene. Atlantic Refining Co. **854 605**

Stabilisation of reaction products of polyisocyanates and polyhydroxy compounds. Farbenfabriken Bayer AG. **854 965**

Processes for the separation of components of mixtures containing rare earths and, if desired, yttrium. Krumholz, P., and Bril, K. J. **854 926**

Trifluoromethyl substituted N-alkylated dibenzazepines and dihydrodibenzazepines and process for the preparation thereof. Smith Kline & French Laboratories. **854 552**

Epoxy resin compositions. General Mills Inc. **854 927**

Polymerisable epoxide compositions. Union Carbide Corporation. **854 679**

Production of alkylene oxide polymers. Petrochemicals Ltd. [Addition to 785 229.] **854 930**

Stereospecific substituted cyclohexylamines and process for preparing same. Schering Corporation. [Addition to 765 902.] **854 932**

Aluminium oxide carboxylates. Hardman & Holden Ltd., and Rinse, J. **854 934**

Process for the manufacture of hydrophilic high molecular weight substances from dextran substances. Pharmacia A.B. **854 715**

Nitration of aromatic compounds. Pittsburgh Coke & Chemical Co. **854 935**

Process for the production of hydrazine, hydrazine hydrate or hydrazine salts. Farbenfabriken Bayer AG. **854 997**

Derivatives of lysergic acid. Westminster Bank Ltd. [Addition to 811 964.] **854 569**

Process for the production of itaconic anhydride. Pfizer & Co. Inc., C. **854 999**

Sulphur dyestuffs of the phthalocyanine series. Cassella Farbwerke Mainkur AG. [Addition to 816 656 and 848 880.] **854 579**

Oil-soluble ester polymers and copolymers. Esso Research & Engineering Co. **854 658**

Ester compositions and process for their manufacture. **855 001**

Process for preparing diisopropenyldiphenyl and homologues thereof. White Laboratories Inc. **855 004**

Method for producing metal salts of diorganodithiophosphates. Esso Research & Engineering Co. **855 005**

Purification of caprolactam. Allied Chemical Corporation. **854 538**

Reaction of alkali metals with epoxides. National Distillers & Chemical Corporation. **854 670**

Butadiene dimerisation. Esso Research & Engineering Co. **855 006**

Substituted pyrazolo-pyrimidines. Ciba Ltd. [Divided out of 854 631.] **854 633, 854 634**

Trifluoromethyl substituted dibenzazepines and dihydrodibenzazepines, and process for the preparation thereof. Smith Kline & French Laboratories. **854 553**

Polyester compositions. Chemstrand Corporation. [Divided out of 853 442.] **854 845**

Open to public inspection 30 November

Catalytic polymerisation of alpha-ethylenically unsaturated monomers. Aries Associates Inc. **855 012**

Process for preparing aldehydes by isomerisation of alpha-olefin oxides. Farbwerke Hoechst AG Vorm. Meister, Lucius, & Brüning. **855 189**

Method of forming alkaline earth metal silicates. Columbia-Southern Chemical Corp. **855 014**

Method of recovery of alkaline earth metal silicates. Columbia-Southern Chemical Corp. **855 015**

Process of making fluorinated acyl fluorides. Minnesota Mining & Manufacturing Co. **855 016**

Process for the manufacture of aliphatic dicarboxylic acids. Filmfabrik Agfa Wolfen Veb. [Addition to 847 621.] **855 190**

Scientific Russian Without Tears

(Continued from p. 678)

Закон (1) сохранения (2) *энергии (2)
(The) law of (the) conservation of energy
считается основным (5а)
regards self (is considered) (a) basic
законом (5) природы (2).
law of nature.

*Радикал (1) CH_3- называется
(The) radical CH_3- names self (is called)
*метилом (5).
methyl.

This discussion of the role of noun and adjective endings in simple sentences may serve to exemplify how endings are used in Russian as means of expression. The general ending system is much the same with pronouns, though their forms exhibit considerable variation. Space limitation precludes discussion of additional complexities that are encountered with various verb forms, especially with the participles. Their use as noun modifiers often results in sentences of considerable complexity. (See Lessons 27-31 of 'Scientific Russian' (2nd edn.), Interscience Publishers.) The subjunctive mood, the various uses of infinitives, the formation of adverbial verb forms known as gerunds also require attention in learning to read scientific Russian. Other important grammatical features include the comparative and superlative forms of adjectives and adverbs, the past and future tenses of verbs, imperative and negative sentences. These various features of grammar constitute a system which is at least as logical in character as English. The important basic facts of Russian grammar are surprisingly few in number. Even the irregularities can be interpreted as variations on the generally prevailing system of regularity. Russian grammar cannot be regarded as presenting any insurmountable difficulties. To quote Shakespeare 'The attempt and not the deed confounds us' (see Macbeth, Act II, Scene 2).

TRADE NOTES

Impalco Aluminium

Technical data on Impalco aluminium are contained in a 70-page booklet issued by Imperial Aluminium Co. Ltd., P.O. Box 216, Witton, Birmingham 6 (a subsidiary company of I.C.I.). The booklet is divided into four sections, dealing first with the company's three grades of commercially pure aluminium, and then with non-heat-treatable, heat-treatable and other Impalco aluminium alloys.

Chromate Coatings

A chromate conversion process for the treatment of aluminium and aluminum alloys is described in a sales and service bulletin, No. 8/60, issued by Walterisation Co. Ltd., Purley Way, Croydon, Surrey. The Cromcote process, as it is called, is claimed to produce a chromate coating with a high corrosion resistance value and excellent paint-bonding properties. In addition, the coating has a very low electrical resistance. Coatings can vary in colour from almost colourless to a deep bronze with corrosion resistance generally increasing with depth of colour. A colourless coating with a high corrosion resistance can, however, be produced by bleaching a deeper colour.

Plasticisers for P.V.C.

Technical service bulletin No. 6 on 'Plasticisers for P.V.C.' has been issued by The Geigy Co. Ltd., Rhodes, Middleton, Manchester. The most important class of plasticisers are esters, and some of these whose polarity and molecular weight make them suitable for use as p.v.c. plasticisers are discussed in the booklet.

New Durez Resin

Durez resin 19759, particularly recommended for grinding wheels, is now available from Omni (London) Ltd., 35 Dover Street, London W.1, sole U.K. distributors, who can supply evaluation samples and prices, and technical data. Durez 19759 is a powdered two-step phenolic resin.

Guide to Gland Packings

Crane Packing Ltd., of Slough, Bucks, have published what they believe to be the most comprehensive reference book to the use of gland packings, that has yet been produced. The book is designed for use as a work of reference and page 1 describes how the correct gland packing can be selected for any combination of service conditions. An equipment code which is reproduced as a book mark flap, provides an at-a-glance reference to the equipment for which each gland packing is suitable. Alongside each gland packing there are code letters to complete the reference.

Adhesive-coated Aluminium Foil

Omni (London) Ltd., 35 Dover Street, London W.1, exclusive U.K. distributors for products manufactured by the U.S. company, Rubber and Asbestos Corp., announce the latest development, Plymaster adhesive coated aluminium foil. This adhesive system was originally developed for light weight, non-load-bearing sandwich panel manufacture in the aircraft industry, but has other potential uses in numerous industrial applications.

Changes of Name

Allied Colloids (Bradford) Ltd., chemical manufacturers, 2 The Green Richmond, have changed their name to Allied Colloids Ltd. and the name of John Beith (England) Ltd., Fleckheaton Road, Low Moor, Bradford, has been changed to Allied Colloids Ltd., Bradford.

Berkshire Industrial and Chemical Agencies Ltd., 11-12 Finsbury Square, London E.C.2, have changed their name to Codron Industrial Agencies Ltd.

Name of Aeropreen Products Ltd., High Wycombe, Bucks, has been changed to Aeropreen Ltd., in view of the far-reaching changes in the company's activities in the last two years. When Aeropreen were established in April 1955, the company was chiefly occupied in converting polyester foams imported from West Germany. For some time Aeropreen have been entirely engaged in manufacturing and marketing their own range of foams and during this period have pioneered much fundamental research and development.

Aluminium Building Sheets

Chemical plants and other industrial buildings are among the applications of troughed aluminium alloy building sheets illustrated in a booklet entitled 'Impalco profiled sheets for building'. Corrugated aluminium sheets for general purposes are also dealt with and it is stated that, except in unusually aggressive environments, Impalco cladding can be used without protective treatment and with minimum maintenance. Data on weights, loadings, erection and flashings are given. Copies of the booklet are available from the Imperial Aluminium Co. Ltd., P.O. Box 216, Witton, Birmingham 6.

High-level Handling

In our reference to the high-level lifting runway at the Ardeer nitric acid plant (CHEMICAL AGE, 24 September, p. 505) the address of British Electrical Repairs Ltd. was incorrectly given. Their head office is at Empire House, 10 Charlotte Street, Manchester 1; the Glasgow works concerned with the project is at 135-143 Reid Street, Glasgow S.E.

CLASSIFIED ADVERTISEMENTS—*Continued from page 686*

BORON PRODUCTS

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PYROBOR* (68.5% B_2O_3)	Tech. 99% min $Na_2B_4O_7$
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26% Cs_2O

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SITUATIONS VACANT

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required for new

CENTRAL LABORATORY AT CHISWICK
(Chemistry and Physics Sections)

The Laboratory is of modern design, well-equipped and provides excellent working facilities. Applicants for these posts should have G.C.E. at "A" level in chemistry, physics and mathematics or O.N.C. in an appropriate subject, as a minimum desirable qualification.
The basic salary range is £411 (at 18) to £805, with additional payments for certain educational qualifications. Commencing salary according to age, qualifications and experience.
Further study encouraged and assisted financially; 5-day week; free travel; medical examination; contributory superannuation scheme.

Apply within 14 days to:
Staff & Welfare Officer (Ref: 604/4),
LONDON TRANSPORT,
55 Broadway, S.W.1.

PRODUCTION MANAGEMENT—S. WALES

Assistant to Plant Manager

This new senior production appointment is to be made to the management staff of the South Wales factory of an expanding company prominent in the manufacture of synthetic resins.
Its initial responsibilities will include:
1. The co-ordination of stock control, supply and distribution procedures for raw materials and finished products.
2. The co-ordination of production planning and control.
3. Production development related to new and existing plant manufacturing procedures, and handling methods.

Applicants for this position should be graduates in the age range 25-35 who have a good knowledge of chemistry and/or chemical engineering, and experience of production management work preferably in the synthetic resin industry.

Please write to Box No. 3729

ENTHUSIASTIC YOUNG MAN required for interesting work in Design Department. Applicants should hold a qualification in Chemical Engineering, or have some years' experience in the Chemical Industry on Process design. The salary will be commensurate with age, qualifications and experience. The Company's policy is one of continuous expansion and adequate opportunities exist for advancement. The successful applicant will be expected to join the Company's Pension and Life Insurance Scheme. Applications, giving fullest details, to Chief Design Engineer, Q.V.F. Ltd., Duke Street, Fenton, Stoke-on-Trent.

SITUATIONS VACANT: continued

PHYSICISTS AND CHEMISTS

are required by the
PRODUCTION GROUP
of the
UNITED KINGDOM ATOMIC ENERGY AUTHORITY
AT WINDSCALE AND CALDER WORKS
CUMBERLAND

to work in the Graphite Monitoring Section of the Technical Branch, which is engaged in the testing and assessment of graphite monitoring specimens of Nuclear Reactors. In addition to making accurate physical and chemical measurements, successful candidates will be required to assist in the remote handling of graphite specimens in the Unloading Facility at Reactor Shutdowns.
A Pass Degree or H.N.C. in Applied Physics or Chemistry will normally be required; however, posts may be available for young people who have G.C.E. or equivalent, in at least five subjects, two of which must be at Advanced Level in Science and Mathematics.
Salaries within the following interim scales, according to qualifications and experience.
Experimental Officer: £1,110-£1,360 p.a.
Assistant Experimental Officer: £475 (at age 18) to £1,005 p.a.
Contributory Superannuation. Staff Housing Scheme.
Send postcard for application form quoting reference number P/W.57/J11, to Staff Appointments Officer, U.K.A.E.A., Production Group, Windscale Works, Sellafield, Seascale, Cumberland.

Closing Date: 31 October 1960

TECHNICAL SALES ENGINEER

required by prominent West Midlands Engineering Contractors to represent the Chemical Engineering Division in the field.
The selected applicant will be required to operate on a countrywide basis and should now have established experience in selling plant and equipment to the chemical industry.
Technical education to H.N.C. level in Chemical or Mechanical Engineering is essential, and drawing office experience will be considered an advantage.
The Company's existing Area Sales forces representing other divisions will provide co-operation in the field and full technical support will be given from Headquarters. A car will be provided together with suitable expenses, and a salary level of £1,000-£1,100 p.a. is envisaged. Staff Superannuation Scheme.
Replies to:
GENERAL SALES MANAGER,
BOX NO. 3730.

BOX NUMBERS: Reply c/o "Chemical Age" • Bouverie House • Fleet Street EC4.

SITUATIONS VACANT: continued

CHEMIST

required to work on physical chemical problems, including analysis of metallic and non-metallic materials and special tests on hydraulic fluids and other substances.

A good knowledge of modern analytical methods is desirable and an H.N.C. or equivalent qualification is a minimum requirement. Salary within the scale £700-£936.

Write for application form to

THE PERSONNEL OFFICER,
MINING RESEARCH ESTABLISHMENT,
WORTON HALL,
ISLEWORTH, MIDDLESEX,
quoting Ref. X.1802/3F.

LOTHIANS RIVER PURIFICATION BOARD

Applications are invited for the undermentioned superannuable post in the Board's Pollution Prevention Department:

SENIOR CHEMIST:

Salary within the grade £1,065—£1,220 per annum. Candidates should possess a degree or equivalent qualification and preferably hold Corporate Membership of the Institute of Sewage Purification. Experience in water, sewage and trade effluent analysis essential.

Applications, stating age, qualifications, experience, present appointment and salary, together with the names of two referees, should be sent to:

The River Inspector,
Lothians River Purification Board,
Springwell House,
Gorgie Road,
Edinburgh, 11.

within 10 days of the appearance of this advertisement.

THERMAL CHEMICAL PROCESS ENGINEER required for Sales and Project Development of new Reaction and Mixing System. Applications should be addressed to GIBBONS BROTHERS LIMITED, P.O. Box 19, Dibdale, Dudley, Worcs.

PLANT AND MACHINERY FOR SALE

Three Lead lined **STEEL TANKS,** 14,000 galls., 9 ft. diam. by 35 ft. long.

Three Lead lined **STEEL TANKS,** 9,500 galls., 13 ft. 6 in. diam. by 10 ft. high.

Two **NICKEL SILVER TANKS,** 6,750 galls., 8 ft. diam. by 23 ft. 3 in.

Brand New **COCHRAN** Vertical and **ECONOMIC** Self-contained **STEAM BOILERS** in stock, also all sizes reconditioned and guaranteed. List on request.

STAINLESS STEEL TANKS, PANS, CONDENSERS, PLATES, VALVES AND COCKS. Very wide selection.

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Baker-Perkins Class BB "Double Naben" 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.

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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.

PLANT AND MACHINERY FOR SALE: continued

600

HORIZONTAL VACUUM DRYING PLANT by Scott, comprising horizontal cylindrical agitated drier 23 ft. long by 4 ft. dia., top centre feed inlet and bottom centre outlet with handwheel control. Jacket pressure 10 p.s.i., chamber pressure 10 p.s.i. Drive by 10 h.p. motor through worm reduction gearbox. Including steel feed hopper, electric vibration unit, steel enclosed belt and bucket elevator, overhead steel holding bin, etc.

VACUUM OVEN by Scott, cast iron construction, 6 ft. 3 in. by 4 ft. 9 in. by 6 ft. 2 in. internally. Single sliding door with support rail and clamps, nine coil shelves, horizontal condenser and receiver, interconnecting piping, and horizontal copper heat exchanger.

HORIZONTAL TOTALLY ENCLOSED STAINLESS STEEL PRESSURE/STORAGE VESSEL by E.M.P., 800 gallons capacity, 5 ft. i.d. by 6 ft. on straight with 8 in. deep dished ends, fabricated 10 SWG. material, 25 p.s.i. w.p. Fitted oval inter/external manway 20 in. by 16 in., 2 in. centre and top connections, 3 in. bottom front outlet with valve, pressure gauge, safety valve, thermometer, etc.

'ADELPHI' HORIZONTAL POWDER MIXER, 400 lb. capacity, mild steel trough 4 ft. 6 in. by 24 in. by 24 in. with cover, side feed opening and bottom centre outlet. Broken scroll agitator pulley driven from 4 h.p. 400/440/3/50 cycles motor, 6 in. dia. inclined worm feeder with feed boot, flange bolted on to side of trough. Drive by 1 h.p. motor.

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MILD STEEL DOUBLE TROUGH MIXER by Strommen, 29 in. by 29 in. by 19 in. deep, twin 'Z' blade, hand tilting and double spur gearing enclosed in oil bath. Hand operated tilting with hinged cover. Lower portion jacketed for low pressure steam. Direct driven by 7½ h.p. 380/3/50 cycles motor.

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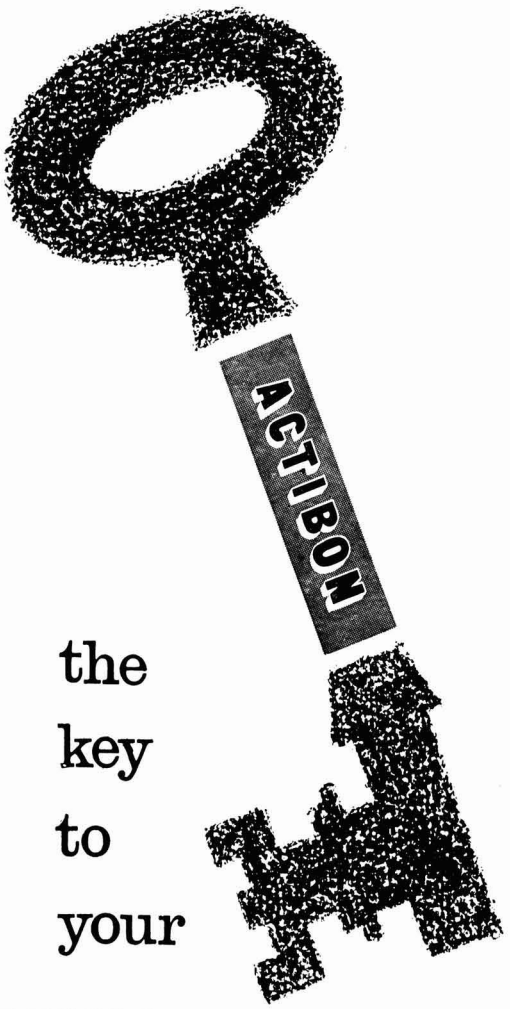

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