Chemical Age

incorporating

PETROCHEMICALS and POLYMERS

VOL. 86 No. 2210 18 NOVEMBER 1961

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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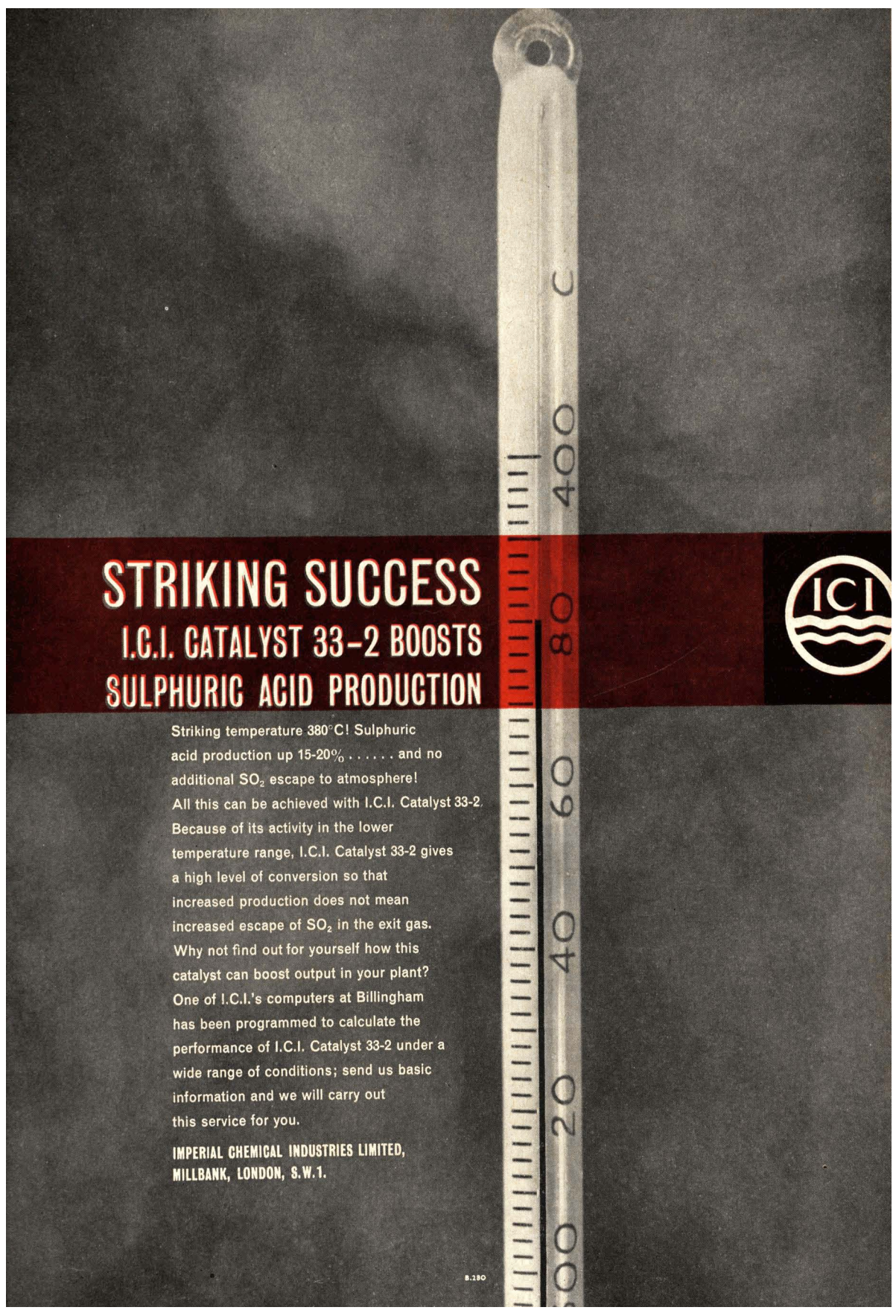

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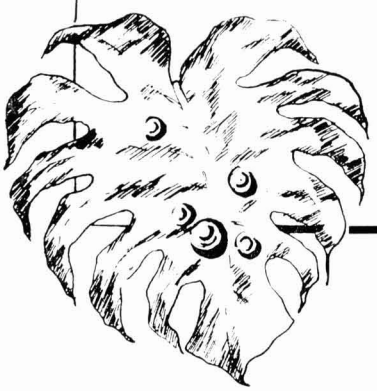

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VOL. 86 No. 2210
NOVEMBER 18 1961

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IN THIS ISSUE

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

Chemical Age
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PETROCHEMICALS and POLYMERS

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EXPORT PROBLEMS

BRITAIN'S chemical producers have a fine export achievement, overseas sales having risen 55% in the years since 1954, compared with a rise over the same period of 38% for all U.K. industry. This performance, however, does not match up to that of the chemical industries of other industrialised countries.

There is no doubt that Britain's entry into the European Economic Community will provide a great stimulus, not only opening up a vast new home market but through more intensive competition from existing Common Market countries it will force British firms to look more vigorously for markets in Europe. It has been said repeatedly in recent months that British industry has stagnated behind high import tariffs and has had no inclination to go out and weather the competitive storm in overseas markets. There is much truth in this, but like all generalisations it is not true of all sections of industry. For a large range of chemicals, tariff protection has been notably lower than in many other countries. Also it should not be forgotten that chemical manufacturers have generally been more active in promoting overseas trade than have many other industries.

There is, of course, still room for much improvement. A number of companies are, in fact, not waiting for entry into the Common Market to become effective before increasing their export activities. Some companies have been 'preparing the ground' for many months past, appointing new agents, setting up sales subsidiaries and generally overhauling their overseas sales departments. There has, too, been greatly increased activity on the part of market researchers, so that companies will enter the Common Market with a good idea of capacities of competitive plants, of the growth potential as well as of import and export trade.

While we believe that there can be little doubt about the eventual outcome of the present round of negotiations in Brussels, it is to be hoped that the applications of other European countries to enter the Common Market will also be successful, for the larger the free trade area the better.

Sooner or later the trading relationship between the United States and Europe will also have to be resolved. Despite the pleas of U.S. industrialists that their tariffs do not give sufficient protection and the threats of politicians that U.S. duties will have to be raised if European countries do not lower their rates, the U.S. tariff is generally extremely high in comparison with Europe. As Mr. J. C. Hanbury, chairman of the Association of British Chemical Manufacturers, recently pointed out in *The Financial Times,* duties on some coal tar and petrochemical products range up to 100 and even 120% *ad valorem,* if calculated on shipping prices. Retention of such prohibitively high duties on large volume chemicals is totally unrealistic and amounts to virtual prohibition on imports. Unfortunately it applies to those European products with the best export potential.

There are, however, signs that official circles in Washington are having second thoughts on the U.S. tariff structure. It has already been suggested that the President should be empowered to negotiate with the Common Market for "reciprocal across-the-board reductions in industrial tariffs", with their eventual elimination as the ultimate aim.

The U.S. administration will find this a difficult policy to put across, but should be given every possible encouragement by European interests.

U.S. proposals for drug patent laws meet stiff opposition

CHEMISTS, lawyers, industrial representatives and the Patents Office all expressed strong opposition to the proposals to curb U.S. drug patents, at the recent hearing before the Senate Subcommittee on Antitrust and Monopoly. The bill, which is designed to stimulate competition in the pharmaceutical industry, proposes that firms should be compelled to license patents to qualified applicants after a three-year period and that molecular modifications of a previously patented drug would not qualify for a patent unless the Secretary of Health, Education and Welfare certified that the new drug showed significantly greater therapeutic effect than the previous one.

Most witnesses at the hearings were insistent that if the new proposals were put into operation, a drastic cut in research would result from the absence of financial incentives offered to the drug manufacturers under the present patent rules.

Compulsory licensing will mean that pharmaceutical companies will rely more on advertising instead of research, thought Dr. J. Bjorksten, president of the American Institute of Chemists. He added that any degree of compulsory licensing would reduce competition between laboratories. This was also the view of the Association of Research Directors.

The new proposals would encourage manufacturers to keep their inventions and methods of manufacture secret, thought Dr. C. A. Thomas, chairman of Monsanto. This trend to secrecy would sharply curtail publication of scientific results in the drug field, he added. This would reduce the opportunity for scientific invention in every industry where knowledge of drug research might be helpful since scientific advances result from building on already known results.

A strong patent system contributes to the invention and marketing of new products was the opinion of the president of the American Patent Law Association. With a patent system of limited effect, indolence would be rewarded by the opportunity to copy without restraint. This, he thought, would destroy the competition so necessary to technological progress.

U.S. drug firms cleared of price fixing

CHARGES of price fixing and monopoly made by the U.S. Government's Federal Trade Commission against five U.S. pharmaceutical manufacturers have been dismissed by the Examiner appointed by the Commission. The five companies involved are Bristol, Cyanamid, Pfizer, Squibb and Upjohn. An appeal against the dismissal can be made by the full Commission.

Not only has the examiner cleared the companies of all charges of conspiracy, price fixing and monopoly, but he has also upheld the validity of Pfizer's tetracycline patent.

The U.S. Government still has antitrust suits pending against Bristol, Cyanamid and Pfizer.

Russians visit Billingham medical centre

Three Soviet officials who have been inspecting the U.K.'s social services recently spent a day at Billingham Division. They are shown here in the Billingham recreational club and the medical centre. The visitors (centre) are G. T. Drosdov, first deputy minister of the Ministry of Social Security, Dr. A. W. Tretyakov and K. L. Blyamikhov. On the extreme right are Dr. E. L. Knowles and Sister Spence of the medical centre

Agreement on Shellhaven St. Albans pipeline

AGREEMENT has now been reached on the pipeline proposed by Shell Mex and B.P. Co. Ltd. from Shellhaven to St. Albans with the Country Landowners' Association and the National Farmers' Union. The pipeline will proceed by way of Harold Hill, Brentwood, Stapleford Abbots, Cheshunt, North Mimms and Colney Heath.

Under the agreement, agricultural owners will receive a minimum of 2s a yard way leave payment, a fixed sum of 4s yard run of pipeline and compensation for all loss and damage from laying and maintenance. Owner-occupiers will receive a further 2s/yard grant for inconvenience caused. Landowners who obtain planning permission to develop their land but who are prevented from doing so because of the pipeline, will either be able to claim compensation or have the pipeline moved.

This agreement has been reached in view of the legislation now in hand to control the laying of pipelines across farm land. Previously, pipelines have normally been the subject of private Parliamentary Bills

Range of carbamates available from Berk

RESEARCH and development quantities of a range of carbamates are now available from F. W. Berk and Co. Ltd. Certain related chemicals have found an application as pre-emergent herbicides, and others are indicated as alternatives to chlorine and phosphorus-based insecticides. There is reason to believe that they may prove useful where growing resistance to insecticides such as DDT has been observed. Among the carbamates which are now available are: diphenyl urethane (ethyl N.N.-diphenyl carbamate), ethyl phenyl urethane (ethyl N-ethyl N-phenyl carbamate), methyl phenyl urethane (ethyl N-methyl N-phenyl carbamate), methyl carbanilate (methyl N-phenyl carbamate). On reaction with alcohols and phenols, higher esters can be prepared under suitable conditions. Dicarbamates and unsymmetrical ureas can be prepared with glycols and amines respectively.

Chemicals to feature at export convention

CHEMICALS will be one of 11 subject groups to be discussed at a national convention to be held at Eastbourne from 29 November to 2 December under the auspices of the Export Council for Europe. Opening plenary address will be given by Mr. Selwyn Lloyd, Chancellor of the Exchequer, while the opening address will be given by Sir William MacFadzean, chairman of the Council.

Chairman of the chemicals group will be Mr. Peter Tennant, overseas director, Federation of British Industries. A market research study group will have as speakers Peter Schmitt (Divo, Frankfurt) and Adri Bakkar (Nederlandse Stichting voor Statistiek, The Hague).

Guest of honour at the convention banquet will be Mr. Harold Macmillan,

Project News

Laporte plan big mineral developments

EXPANSION and modernisation plans of the **Laporte Industries Group** in their Derbyshire mineral interests, will give an initial annual capacity of 20,000 tons of acid grade fluorspar, between 6,000 and 8,000 tons of barytes and 1,000 tons of lead. Production is due to start by mid-1962.

The plant is at the site of the Cupola Mining and Milling Co. Ltd., acquired by Laporte last year, and whose operations are carried out close to those of Glebe Mines Ltd., at Eyam, Derbyshire. Laporte state that these developments will provide Europe's most advanced mineral treatment plant.

Acquired by Laporte in 1959, Glebe have developed a unique plant for the successful separation of the three economic minerals—fluorspar, barytes and lead—to a high degree of purity. The new plant follows the same pattern but embodies further developments in mechanisation and automation. When production begins a lorry load of crude oil will arrive every 10 minutes and the plant will handle ore at the rate of 50 tons an hour, including part processing of the crude ore for the existing Glebe operation.

Core drilling is now in progress at Longstone Edge, in the same part of Derbyshire, on the additional areas acquired last year. Aim is to prove the strata prior to mining developing. It is already apparent that very large ore reserves exist in the deposit which has a great potential.

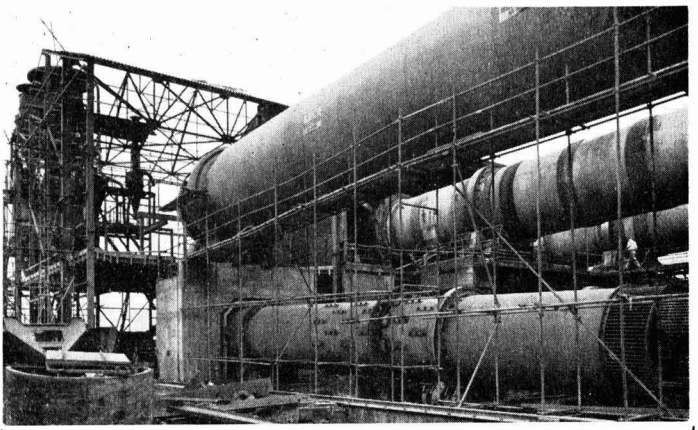
Construction starts in New Year for I.C.I. Rotterdam

● CONSTRUCTION of the first plants and services at the Rotterdam site of **Imperial Chemical Industries Ltd.** will start early next year. Currently Rotterdam Port Authority is raising 64 acres of the site to the level of the surrounding dykes. Rest of the site is still being formed.

The site has been named Rozenburg Works, after a nearby village and Ir. A. van Namen, a chemical engineering graduate of Delft, has been appointed works general manager.

Shell polyolefins plant due on stream early 1962

● POLYOLEFINS plant at Carrington of **Shell Chemical Co. Ltd.,** is now due on stream early in 1962, instead of the previously announced date of late-1961. The delay has been caused by labour trouble among construction workers, employed by the main contractors. A strike of more than 2,000 workers, which started more than two weeks ago, was settled with the men returning to work on Wednesday this week. Settlement was reached following a meeting in London last week between the contractors and leaders of six unions. The men will receive 1¼d/hour extra; they struck for 1s/hour wage increase. Contractors on this plant are **Matthew Hall and Co. Ltd.,** and **George Wimpey and Co. Ltd.**



Third sulphuric acid kiln nears completion at the Whitehaven site of Marchon Products Ltd., of the Albright and Wilson Group (see 'Project News', 7 October)

Phthalic plant exceeds rated capacity

● AFTER the initial teething troubles **I.C.I. Billingham Division's** fluid bed phthalic anhydride plant at Wilton is now working very well and in fact has exceeded expectations. The plant is producing at beyond its design capacity of 15,000 tons/year and recently was operating at the equivalent of 18,000 tons. I.C.I. say that yield and production rate can be increased in fact to the equivalent of 21,000 tons a year.

P.G. awarded reforming plant contract

● A CONTRACT for a 60 million cu. ft. a day reforming plant has been awarded to the **Power-Gas Corporation Ltd.** by the **North Thames Gas Board.** The plant, which is due to go into operation at Southall in July 1963, will use a hydrocarbon feedstock supplied by pipeline from the Esso refinery at Fawley (see CHEMICAL AGE, 28 October, p. 667).

The plant will consist of four furnace units each complete with prehydrogenation and shift conversion plant. The final specific gravity of the gas will be adjusted by carbon dioxide washing in a Vetrocoke carbon dioxide removal plant for which Power-Gas are licensees. The carbon monoxide content of the final gas will be about 2½% which reflects the current trend in the gas industry.

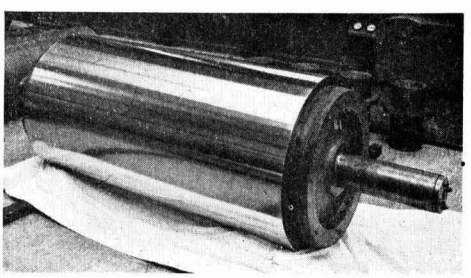
The process engineering work will be carried out by the Gas Plant Division at Stockton-on-Tees. Power-Gas will be responsible for all aspects of the work on the reforming plant at Southall including civil engineering, plant design, construction and commissioning.

Rosedowns cooler rolls for Chilean nitrate

● FOUR cooler rolls are being supplied by **Rose, Downs and Thompson Ltd.,** Hull, a member of the Davy-Ashmore Group, to **Richard Simon and Sons Ltd.** for incorporation into machines for an iodine production plant the latter company is manufacturing for export to the Nitrate Corporation of Chile.

Each roll, of 28 in. diameter by 60 in. long on the barrel and having a gross weight of 25 cwt., consists of a hollow cast-iron body clad with Hastelloy C

(*Continued on page 808*)



One of the four Hastelloy-clad cooler rolls supplied by Rosedowns to Richard Simon and Sons Ltd.

DISTILLATES

WHILE many nitrogen pundits have been expressing gloomy forecasts about over-capacity in the years ahead, at least one major producer sees a need for substantial new capacity. Speaking at a recent meeting in Philadelphia, Mr. J. R. Riley, president of Southern Nitrogen, said that despite the 800,000 tons of nitrogen capacity now being built in the U.S., even more will be needed if a serious shortage is to be avoided.

Mr. Riley thinks that U.S. consumption will total 4.75 million tons in 1965, requiring a minimum capacity of 5.3 million tons. Current capacity is 4 million tons which should be raised to 4.8 million tons when current projects are all completed in 1964. It is also thought that higher consumption by the U.S. services will have a marked effect on demand.

That Southern Nitrogen are fully confident of market growth is obvious from the fact that the company anticipates that 1962 sales will total about $17 million, 24% up on 1961. The current issue of *Nitrogen* estimates 1961 world capacity at 14.5 million tonnes, which by 1965 may top 22 million.

MY recent visit to Shell Chemical research laboratories at Carrington (see CHEMICAL AGE last week) brought home to me very forcibly the great change that has taken place in analytical laboratories. Analysis by gas/liquid chromatography or detection of nuclear magnetic resonance is a far cry from the messy, smelly procedure of my college days, when lead came down all over the place in spite of every effort to get rid of it and hours were spent in evaporating to dryness round group V.

I wonder, though, if the present-day analyst sitting in his smart clean lab. coat twiddling knobs does not sometimes wish nostalgically for the smell of H_2S in the air. A cartoonist in this week's edition of *Punch* evidently thinks so.

IT SEEMS that all is not going well with the Italian Government's plans to speed industrialisation in the south. Little official help is apparently being given in the supply of vital services such as roads, landing stages, reservoirs, electric-power lines, etc.

At a recent conference held in Milan on industrial prospects in Sicily, Count Carlo Faina, president of Montecatini, said that despite his company's heavy investment in chemical plants at Porto Empedocle, the port is still short of water simply because the authorities have yet to build an aquaduct to bring water that is available not far away. Faina complained that port facilities were so inadequate that chemicals produced by Montecatini-Akragas plants could not be shipped from the port, but had to go to rail to Palermo.

Edison's consigliere delegato, Mr. de Biasi, declared that although some 100,000 million lire had been invested by Sincat and Celene in plants in the Priolo-Melilli area, the group had to attend to the building of roads, jetties, electric-power supply and water reservoirs. Italian industrialists believe that if the authorities refuse to provide the necessary services, then investors may well prefer to spend their money in sites that are better developed.

THE role of the chemical merchant in the promotion of exports has always been a vital one and is likely to increase in importance with a wider trade under the Common Market. The article in p. 813 reveals many day-to-day aspects of a larger merchant's business which are either taken for granted or not recognised by chemical producers.

For instance, merchants have done much to promote the use of new materials, to utilise new sources or to arrange new production facilities. One of the most interesting developments in animal feeding stuffs for many years—Pagura—resulted from a merchant (Charles Page and Co.) approaching a manufacturer in this way. Turnover may well reach £50 million in three years.

Mr. G. H. Owtram, Page's managing director, and former chairman and managing director of Petrochemicals Ltd., tells me that the strongest modern industrial connections and technical knowledge must be combined with experience gathered over perhaps the last 100 years, and friendships cemented in many corners of the world to export successfully in a world where economy, speed and flexibility are essential.

Owtram, in fact, envisages the day when the merchant houses act in association, co-ordinate their trading activities and have the same status as the chemical manufacturer.

THE end of the common housefly is in sight and I can think of no possible reason for mourning its extinction. From Olin Mathieson Chemical Corporation, New York, comes news of a new research chemical that can, it is claimed, sterilise the housefly on contact, thus eliminating all future generations.

Chemically, the product is hexakis (1-aziridinyl) phosphonitrile. The fly-killer stems from research initiated by the U.S. Department of Agriculture with the aim of finding a product to overcome the fact that many strains of flies have developed immunity to conventional pesticides. It is said that the new product, known as Apholate, will sterilise flies if they eat it or even walk on it.

According to our U.S. contemporary, *Oil, Paint and Drug Reporter*, the target date for commercial introduction is 1964. Olin estimate the market to be worth more than $10 million a year.

REGULAR commuters will rave over the new book "Pass Along There", by Peter Dark (Andre Deutsch, 105 Great Russell Street, London W.C.1, price 9s 6d net). To the casual traveller it will be revered as the long awaited fifth gospel. Foreigners to our "system" will refuse to believe its tale.

Travelling in London, as most of my readers will have experienced, can be very frustrating, so it says much for Mr. Dark's humour that in exposing London's transport with all its idiosyncracies he succeeds in making us laugh, or does he? —he could be laughing at me!

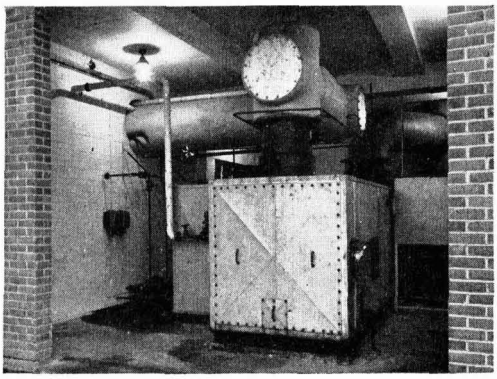
The illustrations are by Brockbank which should suffice on that score, as no recommendation from me is likely to do them justice.

Alembic

"Y'know what I miss, though ?—that good old pouring stuff from one test tube into another"

By courtesy of "Punch"

Catalytic combustion treatment of phthalic anhydride tail gas



Holmes catalytic process plant at Totton Works of South Western Tar Distillers Ltd.

A PROCESS for the treatment of tail gases from phthalic anhydride plants, already well tried in the U.S. and Canada, is now being used in the U.K. as an answer to the fume nuisance which occurs in phthalic anhydride manufacture. The process uses catalytic combustion techniques introduced on a commercial scale by the Catalytic Construction Corporation, Detroit, U.S., and the C.C.C. catalyst is now used in plants which are manufactured in the U.K. by the Chemical Engineering Division of W. C. Holmes and Co. Ltd., Huddersfield.

Holmes have two plants treating phthalic anhydride tail gas at work in the U.K. and a third will shortly go to work. This is a repeat order from one of the original clients and will operate in conjunction with extensions to their phthalic anhydride manufacturing plant. In the U.S. and Canada, Catalytic Combustion have installed over 50 units for the treatment of phthalic anhydride tail gas over the past few years. The treatment is applicable to phthalic anhydride plants using both the fixed bed and fluid bed manufacturing process.

Troublesome tail gases

In the manufacturing of phthalic anhydride by the controlled catalytic oxidation of naphthalene or ortho-xylene with air under pressure, with recovery of the crude product, the residual tail gases are afterwards discharged to waste. These gases consist of nitrogen containing 12-15% oxygen, and organic contaminants. The organic content is usually of the order of 1 g./cu. ft. and consists of carbon monoxide, phthalic anhydride, maleic anhydride, aldehydes, naphthaquinones and traces of other complex organic compounds. The tail gas also contains sulphur originally present in the feedstock to the plant.

The tail gases produced are not fit for direct discharge to atmosphere: they have an evil stench, and are strongly lachrymatic. The contaminants are not all present in the gas or vapour phase; some exist as aerosols, and some as particulate material of a resinous nature. The tail gas is bluish in colour. Composition of the tail gas varies from plant to plant depending upon the type of feedstock used, the operating conditions, and on the type of catalyst used to effect the conversion to phthalic anhydride.

Little or no attempt was made to ameliorate the quality of the tail gases discharged to atmosphere from the first phthalic anhydride plants, but as the size of manufacturing units increased the need for some form of fume correction was apparent. The scope of the problem is indicated by the suggestion made by one authority that the maximum concentration of aldehydes present in the mixture should not be more than 40 p.p.m. to produce an acceptable effluent, and that 60 p.p.m. would not be tolerable. Before the introduction of catalytic combustion the usual method of fume treatment was wet washing, using various liquids as the washing agent. Generally the aerosol content of the fume was unchanged, which gave a coloured effluent, and although the compounds giving rise to odour and lachrymatory effects were reduced in quantity the tail gases were still objectionable both from odour and lachryma content.

In the method of tail gas treatment introduced in the U.S. by Catalytic Combustion, carbon dioxide and steam are produced from the combustible organic contaminants, and any sulphur contained in the tail gases is discharged as sulphur dioxide. The quantity of sulphur present is usually low due to the high purity of the feed material and does not present any air pollution problem. The resultant gases are colourless and do not contain any appreciable odour.

The catalyst used is of all metal construction, and is resistant to mechanical and thermal shock. By virtue of its all metal construction the catalyst has high thermal conductivity coupled with low heat capacity, so that temperature response is very rapid. The catalyst is made up of separate elements which are supplied in two sizes: the first measures 18 in. by 12 in. by $2\frac{3}{8}$ in. and will treat 320 s.c.f.m. and the second measures 18 in. by 24 in. by $2\frac{7}{8}$ in. and will treat 700 s.c.f.m. The requisite number of these elements are arranged side by side in a supporting frame (rather like a number of panes in a window).

The catalyst has a long life when processing phthalic anhydride tail gas, usually in excess of 30,000 hr. Three plants in the U.S. have worked for seven years with the original batch of catalysts, and a number of other installations have given catalyst lives of 50,000 hours or more. The heat resisting/corrosion resisting metal support accounts for a high proportion of the catalyst cost so that these supports have a high reclaim value, and can be used after suitable treatment to prepare other elements equal in activity to new ones. This regeneration process costs about 40% of the original new catalyst price, and can be carried out a number of times before the support is no longer suitable for re-use.

The tail gases produced in the manufacture of phthalic anhydride are very objectionable from an air pollution aspect but have a relatively low organic content and hence energy content. The energy content is variable depending upon the source of the gas, and is often less than 2 B.Th.U./cu. ft. In normal combustion practice it would be necessary to heat those gases to about 1,400°F to ensure efficient combustion, and hence efficient fume nuisance removal. By using catalytic combustion it is possible to reduce the temperature to which the fumes need to be heated to between 700 and 750°F, thus reducing the fuel requirements of the process. By incorporating a heat exchanger the fuel requirements are further reduced. Due to the low temperature required for catalytic combustion the plant can be of all metal construction.

In the W. C. Holmes plant installed at the Totton, Southampton, works of South Western Tar Distillers, Ltd., tail gases are first passed through a tubular heat exchanger and then into a combustion chamber containing an oil burner, where the gases are finally heated to catalytic reaction temperature. The mixture of tail gas and hot burner flue gases is drawn into a centrifugal fan and discharged over the surface of the catalyst where combustion of the objectionable constituents takes place. Before discharge to atmosphere the oxidised gases pass to the heat exchanger to preheat the incoming tail gases. The discharged gases are free from colour and are virtually odourless.

To ensure automatic and safe operation the plant is fully instrumented. An alarm system is incorporated to give warning of any faulty operation. Maintenance is confined to lubrication of fans and motor, burner maintenance, and general maintenance of instruments.

Saharan gas catches fire

French and American engineers have been fighting to extinguish a new flare-up of natural gas at the Gassi-Touil drilling site in the Sahara. The gas originally caught alight on 3 November when it was first tapped. It is escaping at the rate of 1 to 3 million cu. m. a day.

Digital computer will control Celanese primary oxidation units

A DIGITAL computer system will control two of the four primary oxidation units of the Celanese Corporation of America at Bishop, Texas. Production at the Bishop plant is about 400,000 tons/year. The system is being supplied by Thompson Ramo Wooldridge Inc., Canoga Park, Calif. Celanese anticipate that the computer system will pay for itself within two years by raising productivity and efficiency. Increased throughput and yield are expected through closer control of such factors as chemical reactor temperature and richness of feedstock.

According to Dr. D. N. Truscott, managing director of International Systems Control Ltd., U.K. affiliate of T.R.W., the computer will exercise closed-loop control over the non-catalytic vapour-phase process that converts liquefied petroleum gases (propanes and butanes) to formaldehyde, acetaldehyde, methanol, ethanol, acetic acid, acetone, and other chemicals. The system will sense about 150 process variables and will control 24 process variables which affect production levels and so enable maximum profits to be achieved. It will itself automatically modify coefficients of the mathematical model stored in its memory as the characteristics of the plant change. The efficiency will thus be the best possible at all times.

In addition to its sensing and control function the computer will print out hourly and daily logs of operating data on an electric typewriter. By continuously scanning the operating variables, the computer is able to warn the plant operator of abnormal conditions which, if undetected, could cause process upsets and equipment damage.

Operating know-how on the Celanese computer control will be made available to International Systems Control Ltd., which is a joint venture of the General Electric Co. Ltd., London, and T.R.W. in the field of computer control for the automation of industrial processes in the U.K., Commonwealth and European Free Trade areas.

Marchon's new phosphate ship

M.V. *Marchon Enterprise* was launched at Clelands Shipbuilding Co. Ltd., Wallsend, on 9 November by Mrs. Otto Secher, wife of the vice-chairman of Marchon Products Ltd., one of the Albright and Wilson Group. The *Marchon Enterprise* with a dead weight of about 2,400 tons, has been designed to carry phosphate rock and will join Marchon Products' first ship, the *Marchon Trader*, in this traffic.

Statisticians confer at I.C.I. meeting

APPLICATION of statistical techniques to the various chemical processes and research activities carried out by I.C.I. were discussed by Mr. G. A. Coutie, Dyestuffs Division, during a one-day conference recently held by I.C.I. on the use of statistics in the company. This conference was one of a series held by various large organisations which are intended to give fellows, associates and students of the Institute of Statisticians some idea of the scope and application of statistics in a number of fields.

Among the techniques used in connection with the various chemical process are a number that have been developed largely by the company's own statisticians. Mr. H. Kenney of Billingham Division discussed the recruitment and training of statisticians at I.C.I. and described the type of work on which they were employed. Papers on the application of statistical methods to sales forecasting, production planning and stock control and the routine application of statistics to sales purchases stocks and personnel also formed part of the conference.

The formal papers were concluded by Dr. A. Baines General Chemicals Division, who described the application of computers first to routine commercial data, production planning, etc., then to plant design and process control, and finally to research and development.

L. to r., E. A. Bingen, a deputy chairman of I.C.I.; Lord Beveridge, president of the Institute of Statisticians, and Dr. J. Ferguson, I.C.I. research and development director

Project news

(Continued from page 805)

material 0.125 in. thick, with mild steel stub shaft ends. For cooling purposes, cold water is pumped through the end of one stub shaft into the hollow roll and out of the opposite shaft end.

Rosedowns supply complete clad rolls in stainless steel and other hard-wearing and corrosion-resistant metals or, alternatively, apply the cladding process to customers' own roll shafts, tubes and drums.

Wimpey get contract for Swedish polythene plant

● CONTRACT for the high pressure polythene plant to be built at Stenungsund, Sweden, has been awarded to **George Wimpey and Co. Ltd.,** Hammersmith, London. The Wimpey organisation will be responsible for the engineering design and overall management, while construction will be by the Swedish contractors, Swenska Industriebyggen A/B and Calor and Sjogren, with Wimpey acting as managing agents.

The polythene project is connected with Svenska Esso's £7 million steam cracking plant to be erected at Stenungsund, for which Fluor Engineering and Construction Co. Ltd. have the contract for detailed engineering and procurement (C.A., 6 May, p. 727), and ethylene from which will supply the 35 million lb./year polythene plant which is a joint project of Union Carbide Corporation and the Swedish concern Fosfatbolaget. It has previously been announced that the cost of the oil cracking, ethylene and first phase of the polythene plants will be £13.5 million.

Work starts on new isopentane unit for Shell

● PRELIMINARY work has started on **Shell Petroleum Co.'s** new £1.5 million isopentane plant at Shellhaven refinery, Essex. Construction is expected to take about 18 months. Isopentane will be produced partly from petroleum naphtha and partly from n-pentane using a Shell process. It will be used to raise the quality of Shell premium and super grades of petrol.

G.E.C. export remote handling equipment for atomic research

● TWO orders for remote handling equipment—one from the Danish Atomic Energy Commission worth £16,454 and the other from the Swiss Federal Office of Works valued at £23,844—have been received by **G.E.C. (Engineering) Ltd.** Both orders include a standard G.E.C. Mark 1 power manipulator with a lifting capacity of 750 lb. (340 kg) and a 1½ ton (1.525 kg.) hoist unit.

The Danish equipment will be installed in new hot cells now under construction at the research establishment at Riso near Copenhagen. The Swiss contract is for the new hot cells at the research station of the Eidg. Institut für Reaktorforschung at Würenlingen, near Zurich.

Chemical Age Export Survey

"There are signs that in chemicals, the rival European economic groupings are beginning to have an effect"

BRITISH CHEMICALS AND THE COMMON MARKET

by

a leading chemical export executive

NOW that the United Kingdom has made formal application to join the European Economic Community, with all that this implies in the way of trade changes, it seems an appropriate time to consider the export performance of the British chemical industry.

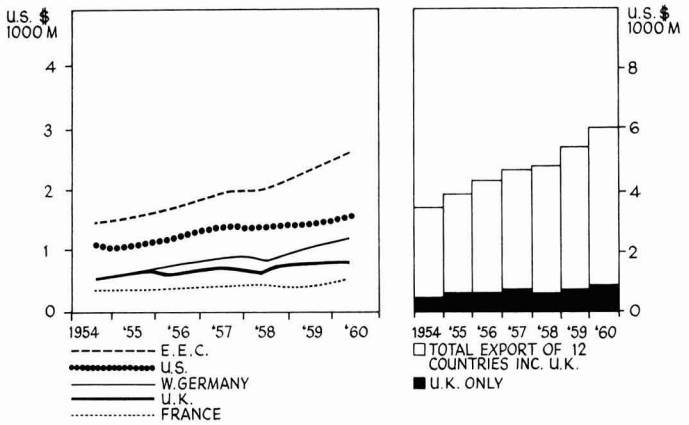
From 1954 to 1960, chemical exports from this country increased in value by 55% and a rise in exports has been registered in each of the years in question except in 1958, the year of the world-wide check to international trade.

A comparison of the figures for January to September of this year with the corresponding period for 1960 show that this expansion of exports has continued, although at a slower rate, 2.7%, than the immediately preceding years of 1959 and 1960, when increases of 12% and 8% respectively were recorded.

Part, at least, of this slowing down appears to be directly due to intense competition in the organic sector of the industry. On all sides, authoritative spokesmen talk of world-wide temporary over-capacity particularly in the petrochemicals and plastics fields. This over-capacity has caused intense pressure on prices and the effect of this may easily be seen by reading any current reports to their shareholders by chemical company chairmen.

This phenomenon is not, of course, confined to the U.K. or to the chemical industry, but is well illustrated by export figures for the plastics industry for the first two-thirds of this year. The statistics show that the volume of plastics materials exported increased by over 14% to some 130,000 tons. At the same time, the

EXPORTS OF CHEMICALS BY COUNTRIES*



Source: Board of Trade Journal, 29 September 1961

value of plastics exports declined by nearly 2% to £28.6 million.

Reference to Table 1, which lists some of the main groups of U.K. products exported, illustrates the wide variety of products involved. As is to be expected, the newer organic chemicals, pharmaceuticals and plastics materials figure prominently, but also exported in large quantities are basic inorganic chemicals many of which have been consistently exported in substantial tonnages for many years, e.g., caustic soda, soda ash, hydrosulphite, zinc oxide and titanium oxide.

As is to be expected, the largest markets for the chemical industry, as for exports of British manufactures, as a whole, are to be found in the Commonwealth and associated countries. An interesting fact, however, is the continuing growth in importance of the European market, both in countries of the European Economic Community and of the Free Trade Area, as a major outlet for British chemicals. Currently, nearly one-third of total U.K. chemical exports find their way into West European markets.

There are signs that, in chemicals at any rate, the rival European economic groupings are beginning to have an effect.

TABLE I.—U.K. EXPORTS

Commodity Group	1959 £M	1960 £M	1961 Jan.-Sept. £M
Chemical elements & compounds	70.3	77.3	57.1
Coal tar & crude chemicals from coal	3.9	3.9	2.7
Dyestuffs	11.7	13.8	11.2
Pigments, paints & varnishes	26.4	28.9	22.5
Drugs, medicines & medicinal preparations	4.90	44.4	36.3
Perfumery & toilet preps., soaps, detergents, etc.	26.3	26.5	21.5
Fertilisers, manufactured	3.4	2.8	1.8
Explosives	10.1	9.6	7.5
Plastic materials	40.0	42.9	31.6
Disinfectants, insecticides, weedkillers, etc.	6.6	7.7	6.1
Tetraethyl anti-knock compounds	12.7	12.7	8.1

TABLE II.—U.K. EXPORTS

Market	1959 £M	1959 % of total	1960 £M	1960 % of total	Jan.-Aug. 1961 £M	Jan.-Aug. 1961 % of total
E.E.C. Countries	47.7	16.3	56.9	18.0	37.1	17.1
E.F.T.A. Countries	31.4	10.7	35.7	11.3	25.3	11.6
Commonwealth Countries, Eire & South Africa	136.6	46.6	143.2	45.2	95.9	44.2
U.S.	11.5	3.9	10.6	3.3	7.3	3.4
'Iron & Bamboo Curtain' Countries	10.9	3.7	12.7	4.0	7.7	3.5
Rest of World	55.0	18.8	57.5	18.2	43.9	20.2

It may be argued whether the tariff changes made to date have had any important influence on the direction of trade or whether such changes as are to be noted are the result of psychological and intangible factors. Nevertheless, the latest figures seem to show that chemical exports to the European Free Trade Area countries, with Sweden in the forefront, are continuing to increase while for the moment, at any rate, exports to the Economic Community overall have ceased to expand.

It is particularly interesting to note that exports to low-tariff countries, such as West Germany and Benelux, whose tariffs would be raised when the E.E.C. Common Tariff is finally achieved, are tending to stabilise or fall while exports to the high-tariff countries, whose tariffs will be reduced, as in the cases of France and Italy, are tending to increase. Obviously other factors are involved and the trends are short-term; nevertheless, they are illustrative of the dynamic nature of the export markets of the world and the need for Government policies to ensure the widest access to other countries' markets before, or at least not later than, the U.K.'s tariff barriers are reduced or removed.

Growth rates compared

As was stated previously, U.K. chemical exports have increased in value by 55% between 1954 and 1960 and this compares with an increase of 38% in exports of all U.K. manufactures. However, the industry does not fare so well when compared with export figures for the chemical industries of the major manufacturing countries of the world, who, over the same seven-year period, have increased their exports by 73% in value as compared with a figure for all manufactures of 75%.

The U.K. chemical industry ranks third in the country's export industries, behind non-electric machinery and road vehicles and aircraft and is third in chemical exporting industries of the world, behind the U.S. and West Germany. Nevertheless, since 1954 it is a fact that the U.S. chemical exports have increased at a faster rate than the U.K. and West Germany, which in 1954 exported by value an amount approximately equal to the U.K., in 1960 exported nearly 50% more than the British industry. Nor is this better rate of export growth confined to the leading countries. The industries of West Europe, such as France, Italy, the Netherlands and Switzerland have all achieved better relative growth rates than this country and, despite certain restrictions on her

(Continued on p. 817)

TABLE III.—EXPORTS OF CHEMICALS BY COMMODITY

U.S. dollar million: percentage change over year earlier in italics

	United Kingdom		E.E.C.		West Germany (a)		Belgium—Luxembourg		France (b)		Italy		Netherlands		United States		Japan		Total	
1954	571		1,398		605		174		336		111		172		1,002		79		3,496	
1955	653	+14	1,557	+11	680	+12	186	+ 7	370	+10	127	+15	193	+12	1,107	+10	94	+19	3,916	+12
1956	685	+ 5	1,718	+10	778	+14	205	+10	367	− 1	152	+19	216	+12	1,260	+14	107	+14	4,325	+10
1957	744	+ 9	1,955	+14	903	+16	219	+ 7	414	+13	156	+ 3	263	+22	1,400	+11	126	+18	4,777	+10
1958	732	− 2	2,042	+ 4	940	+ 4	231	+ 6	429	+ 4	169	+ 8	273	− 3	1,362	− 3	138	+ 9	4,821	+ 1
1959	821	+12	2,362	+16	1,105	+17	258	+12	472	+10	208	+24	319	+17	1,502	+10	167	+21	5,467	+13
1960	887	+ 8	2,716	+15	1,261	+14	254	− 2	593	+26	271	+30	337	+ 6	1,645	+10	169	+ 2	6,046	+11

(a) Inc. Saar from July 1959 (b) Exc. Saar from July 1959

IMPORTS FROM WEST WILL HELP BUILD SOVIET 'BOLSHAYA KHIMIA'

Groundwork will put U.K. exporters on the target

ONE of the Soviet Union's declared objectives in the competitive development of its economy is the achievement of the so-called "Bolshaya Khimia"—a great chemical industry. This objective will be achieved according to existing Plans partially by the end of the current Seven Year Plan in 1965 and finally in 1970.

Hand in hand with this development on the part of its predominant partner, the Council for Economic Development (COMECON) comprising the U.S.S.R. and the Communist European countries (apart from Yugoslavia) envisages a correspondingly big development in the countries of nearly all its members. This big push forward is the direct result of the Soviet Union's realisation during the 1950's that whereas industries such as coal, steel, oil and electrical power had grown to lusty maturity, the chemical industry was one of the weakest brethren in the industrial family. The industry in the U.S.S.R. was in many respects technically backward, undiversified and understaffed: in the rest of Eastern Europe the situation was very similar with bright spots principally in the East German "rump" of the old I.G. Farben complex, and the technical basis provided by the Rumanian oil industry. A rapid expansion generally was therefore imperative in order to avoid serious dislocation of the Eastern bloc's development.

The objective of this expansion is the raising of the chemical production of the Soviet bloc as a whole towards self-sufficiency: this is to be achieved by virtual self-sufficiency in the U.S.S.R. and a division of labour among the satellites, in many cases on the basis of Soviet raw materials. Particular emphasis is to be given to synthetic materials and to agricultural chemicals, especially needed to give impetus to the bloc's agricultural improvements.

The percentage expansion of chemical output expected in 1964 together with the equivalent expansions in the oil and gas industries is given in the following table:

	1955	1961	1964 output as % of 1955
	Million tons		
Oil	70.8	166	234
	Thous. million cu. m.		
Gas	10.4	59.5	575
	Thous. million roubles		
Chemicals	3.7	7.6	205

Synthetic materials according to the recent Soviet Party statement are regarded as particularly important in order to replace natural materials such as metals, woods, cotton and wool at lower cost. Some of the production figures which are planned—quoted as always in percentages—envisage growth as follows:

	1958	*1965*
Plastics and synthetic resins	100	700
Mineral fertilisers	100	300
Chemical fibres	100	400

The division of labour outside the U.S.S.R. will be along the lines of existing capabilities. In East Germany, Leuna and Bittefeld provide a strong basis, and in Rumania petrochemicals will be developed. East Germany is scheduled to play a major role in the production of dyestuffs, pharmaceuticals and plastics and its chemical plant manufacturing industry is also regarded as an important link in the bloc's interlocking development. Hungary is to concentrate on the nitrogen industry and Poland has a special part to play in producing other types of heavy chemicals and artificial fibres.

In the achievement of these objectives the Eastern bloc reckons to possess a number of advantages. The first of these is the availability of plentiful cheap raw materials, particularly in the U.S.S.R. Russian oil is to be piped to its own chemical centres and to East Europe. Similarly the Russians are already using extensively their own natural gas in their factories. In addition there is Kola and Kara Tau phosphate, East German and Russian potash, Polish sulphur and Rumanian oil. Further large resources are as yet untapped. Secondly the Communists realise that they have an unrivalled opportunity to plan a logical development for their chemical industry. In addition this development can be carried out on the basis of the most up-to-date world technology. Recognising the leading position of the U.S. and West Europe they do not hesitate to shop for 'know-how' abroad.

All these programmes however have run into serious difficulties and there is every indication that planned progress is seriously behind schedule for a number of reasons. A particular bottleneck exists in the production of chemical machinery, and this has held up numerous projects throughout the bloc. Lack of good quality personnel has also been another factor resulting in fairly frequent mistakes in design work. Furthermore, many delays both technical and administrative have been met in the overseas plant buying programme. In general the bloc is far from overcoming the childhood problems of this branch of their industry even though it has grown considerably stronger than it was five years ago.

How to gain trade with Eastern-bloc

Fresh approach needed to deal with countries having totally planned economies

Background knowledge of industry and politics essential

Most business contacts with State trading houses

Currency problems vary widely within the Soviet-bloc, but there is never any question of defaulting

Exhibitions only point at which U.K. producers can meet users

Supply of plants and know-how will help Soviet-bloc meet chemical industry targets

Long-term prospects for trade in goods in temporary short supply

Essential background

This background is essential to an understanding of the type of business, which is available in these countries. But an additional factor which is often overlooked is that whereas Western nations regard trade as an integral part of their economic way of life, in Communist countries it tends to be regarded as a useful tool to be used when other mechanisms will not suffice to make the Plan work. Self-sufficiency within the bloc is the fundamental objective even though in practice this may never prove to be possible.

The types of business available to foreign chemical industries are therefore:

1. *Short term.* The supply of products of a speciality nature, which the Eastern bloc does not know how to manufacture as yet, or the production of which has not yet been organised. This business can obviously be expected to tail off as

Export seekers must learn to deal with totally planned economy

their chemical expansion programme develops.

2. *Short term.* The supply of chemical plant and process know-how. This is, of course, particularly important at present and there is every likelihood that with their own programmes running into difficulty the Soviet-bloc countries will have to introduce a 'crash' buying programme from abroad in order to meet their targets. In the long term, however, this business is likely to tail off as the chemical plant industry develops within the bloc. Whether in the meantime the bloc will find ready sellers of plant and know-how is another question.
3. *Long term.* The supply of products in temporary short supply. This is what one would regard as the normal interplay of trade between big industrialised blocs. In one year, for instance, product A in country B and product C in country D will be in short supply and traded between them, and in the next year it may well be exactly the other way round. Planned economies are just as much if not more subject to this type of temporary shortage as capitalist nations. In fact the present Eastern bloc difficulties are a typical instance.

New approach needed

These then are the targets at which to aim: but how does one set about getting a bull's eye? The first necessity is for an entirely fresh approach. One is no longer dealing with the variety of practice of Western business but with totally planned economies and all that that implies.

To get to grips with the problems involved it is necessary to study the basic essentials of how these economies work. Such questions as the way industry is organised, the import and export procedure and the overall development targets of the economy are fairly obvious; but more important still is the general climate and feeling in these individual countries. This can vary considerably from one country to another.

In general, the Soviet Union differs from all the others in two respects. The scale of business to be done there is bigger and what one might call the 'orthodoxy' of trading procedure is greater. All other countries of the Eastern bloc were until 1945 operating within the tradition of Western capitalist commercial practice. Many of the officials still working there are fully familiar with Western business methods even though they are operating now within a Communist framework.

The U.S.S.R. has no such tradition. For instance, in the U.S.S.R. the foreign business man's contacts are almost entirely with the state trading houses through which in all Eastern Europe import and export is carried out. In the majority of cases contact with Soviet customers is extremely limited and most orders are placed without the client's name ever being revealed. Contact in depth with technicians and customers is possible but it is a laborious process governed by protocol. In contrast, in Poland or Czechoslovakia visits to factories are much more frequent and all round contact is easier to maintain. There is altogether less secretiveness, answers are more often received to letters and the standard of commercial expertise is higher. In Rumania and Bulgaria conditions in this respect are nearer to those of the U.S.S.R. while Hungary and East Germany stand somewhere in between.

Overall in the Eastern-bloc the foreign business man has to do much more work in order to maintain efficiency and contact at a level to which he is accustomed than he would ever dream of doing in capitalist markets.

Representation problems

Perhaps the major difference in the business climate is the impossibility of maintaining a satisfactory form of representation in these countries. The Communists will not at present allow the establishment of foreigners' offices in their country and either for legal or practical reasons there is no possibility of having local agents. Business contact has to be maintained either at long range or by frequent and laborious visiting. Equally, with no commercial foothold in the country, the exporter cannot expect advertising to come to his assistance, because in its Western form it is ideologically unacceptable. Advertisements are in fact limited to a very few journals and to a very sober layout, and the salesman has to rely more on lectures or meetings with assembled technicians and production personnel sometimes aided by films or pamphlets.

In such conditions exhibitions take on an added significance, since they provide an unusually good occasion to contact potential customers and to get across the sales message. It is important, however, to be sure in advance that there is a reasonable chance that the message is likely to produce results. The East European generally is avid for information and will always look at an exhibition, but whether this will lead to any orders is an entirely different matter. This was a lesson which many exporters at Moscow this year failed to learn in advance.

Finally there is the all important and fundamental question of currency. With their bilateral conception of trade, the Eastern-bloc is faced with the perennial problem of finding enough money. Even without bilateralism the bloc as a whole would be wanting at present to import far more than its potential exports could pay for. Admittedly the problem varies from country to country. For instance Rumania manages apparently to cover all its import requirements at the present with what it earns but its requirements have probably not yet reached peak levels. Czechoslovakia and East Germany with fairly varied and sophisticated export ranges are reasonably well off. Poland, Hungary and Bulgaria on the other hand are in acute difficulty because of the limited export possibilities to those countries from which their imports chiefly come. The U.S.S.R. has a similar problem aggravated by the biggest potential demand for imports of any of these countries. Nevertheless, in spite of these currency difficulties one problem which never arises is that of default on payment—a matter about which all State trading nations must obviously be most scrupulous.

All this appears to add up to a formidable list of difficulties. In fact there is something of a dilemma posed to any exporter not only the chemical exporter. Obviously he must make a market assessment. He must know whether his products are needed, and are technically acceptable, whether if they are bought they will be correctly used, what is the future perspective, how strong are his competitors, whether his technical effort will simply result in his giving valuable information without getting results. Most important of all he must find out whether his product is regarded as sufficiently necessary to find a place in the Plan.

Faced with these important questions he is nevertheless cut off from many of the means normally available to him to get the answers. But some sort of preliminary assessment must be made, since only then can he plan whether or not to work out a sales campaign involving further promotion, exhibitions, technical effort and the necessary frequent visits by his own sales force or by merchants specialising in the market—very often the most satisfactory answer in these countries.

Business risk

In the last analysis it is the old question of whether or not to take a business risk. Immediate and easy results in these markets are the exception, as they are anywhere. There is even a sense in which in the Eastern-bloc one either hits the bull's eye or scores nothing. It is possible to obtain very large orders from the state buying organisations and once established a supplier can often hold a long-term position if he remains competitive. Equally months and years of labour can be fruitless for no very apparent reason.

One thing is certain, in attempting to scores a bull's eye in trade with East Europe the rifle itself will go off at half cock, if the situation in the chemical industry and the political and organisational background are not thoroughly understood in advance.

THE CHEMICAL MERCHANT

Widespread merchant connections of great value to U.K. in Common Market trade

By
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Technical sales development manager, Chas. Page and Co. Ltd.

PURPOSE of the chemical merchant is to facilitate the supply of raw materials and the distribution of finished products, particularly overseas. In performing this service to the manufacturer and the consumer, a wide variety of activities and fields of interest is involved.

'Chemical' often includes materials which are not usually regarded as chemicals, e.g. starch derivatives, synthetic rubbers, plastics, food components, minerals and animal feeding stuffs. Although some of the big merchant concerns are mainly engaged in the purchase and sale of stocks, they nevertheless act also as agents for manufacturers at home and abroad, who are thus relieved of the expense and organisational difficulties of a sales office perhaps at a great distance from the factory.

Barter deals to minimise international currency difficulties, the licensing of patents, and the sale of know-how, are well established practices, while market assessment, the chartering of ships, and the expert handling of duties and government regulations are traditional services, but nowadays progressive firms must also offer efficient technical service to ensure that the right materials are used in the right way.

Long experience

The strongest modern industrial connections and technical knowledge must be combined with experience gathered over perhaps the last 100 years, and friendships cemented in the U.S., France, Germany, and the far corners of the earth to export successfully in a world where economy, speed and flexibility are essential. As small economic units progressively coalesce into large ones, such as the Common Market and E.F.T.A., the distance between producer and consumer increases, and their social customs and market patterns diverge, so that the merchant's widespread network of connections becomes increasingly important to a nation dependent upon exports. Just as in the old days merchants sought out new products and new markets, and combined the two, they still contribute largely to progress by matching supply and demand.

Although manufacture and conversion cannot be considered to be merchanting activities, several merchant firms are also producers in their own right. Production and merchanting are complementary, and the larger merchants have the advantage of very close associations with certain specific manufacturers—closer, perhaps, than many a large organisation and its own export department. When a new overseas demand has been discovered, whether it be for an oil additive, a cosmetic emulsifying agent, a pig starter-food, or an ice-cream ingredient, this close liaison is necessary, and the merchant uses his freedom of choice to advantage in selecting the most suitable manufacturing unit for the purpose.

By concentrating the whole of his attention on marketing problems without being controlled by the inertia and momentum of expensive production plants which must be built and kept occupied, the merchant can compete successfully in difficult markets abroad, and is always building up U.K. production at the same time.

Another activity of merchant companies which frequently increases international trade is the encouragement by capital investment of specific manufacturing or selling units with which they are associated. Many a project which has been brought to light by the merchant, and co-ordinated with producer and consumer, is beset by difficulties in its early stages because of shortage of capital. Without sufficient capital progress would be severely delayed, and at this point an investment is welcome and yields lasting benefit to all concerned.

As a matter of policy, the merchant should not confine his interests within any specific limits, but should be prepared to move into any field to remove bottle-necks. Take the case of a plant working to capacity to supply the home market; quite a common situation. The stimulation of an export demand is not likely to be profitable, and may even be a nuisance unless it is balanced with investment in new production capacity and probably transport and storage facilities abroad. Once the investment is provided, the benefits are, of course, enormous, and in this way companies which are based on merchant operations and export-import trade become very closely involved in diverse fields, the only common denominator being the aim to expand sales.

In many ways storage may be regarded as a necessary evil, but it is none the less necessary, and is responsible for locking up, in the U.K. and abroad, a considerable proportion of the merchant's capital. When the production or availability of any particular material is in excess of consumption, the merchant can provide an excellent service by building up stocks. However, it goes without saying that it is to everybody's advantage to keep stocks as low as possible without giving rise to a shortage.

It is not easy to decide on the optimum stock to build up so as to last just long enough to tide over the following period when consumption exceeds production. What is not generally appreciated is that the risks involved are very large—except by the larger merchants who take the risks—since success depends on an accurate estimate of not only production and consumption, but also the extent of alternative stocks and competition from alternative materials at different price levels.

The divergence between production and consumption is very often seasonal. Many agricultural products such as cereals, potatoes, timber, and sugar cane provide a fluctuating source for chemicals and by-products, and natural extracts such as alkaloids are of purely seasonal origin. On the other hand, the rate of production of fungicides, herbicides, and insecticides of mineral or synthetic origin, is limited only by the capacity of the plant, while consumption may vary seasonally between zero and a sharp peak. Preservatives and stabilisers for the food industry, chemicals for the building trade, anti-freeze materials, all invite the merchant's attention.

Close association

All parts of a merchant organisation are closely associated with manufacturers and customers, which means that its activities are governed entirely by the customers' requirements, and are not influenced by departments which function in isolation. Neither are the sales restricted to the output of any particular factory, so that, having determined the customers' precise requirement, the technical development department is quite free to suggest new materials, to utilise new sources, or to arrange new production to meet it.

In conclusion it may be said that the merchants have built up an international fraternity for the promotion of trade in chemicals and allied fields, and the distinction between home trade and export trade tends to be less marked than in many manufacturing industries. In a nation which depends to a large extent on raw materials obtained from abroad, it is of prime importance to increase their

(*Continued on page 816*)

U.K. chemical imports and exports

EXPORTS and imports of chemicals from the U.K. in January-September 1961 are compared with the same period of 1960 in the following tables. Total exports during the first nine months of 1961 were valued at £242,438,407—2.7% more than the January-September 1960 figure of £235,966,696. Imports, at £127,765,304 (£131,059,313) showed a 2.5% decrease.

EXPORTS

		QUANTITY		VALUE	
		January-September 1960	January-September 1961	January-September 1960	January-September 1961
INORGANIC				£	£
Acids	Cwt.	256,472	268,450	883,602	914,766
Copper sulphate	Tons	21,426	18,876	1,680,580	1,438,721
Sodium hydroxide	Cwt.	3,515,689	3,606,782	3,774,138	2,973,334
Sodium carbonate	,,	3,175,651	3,595,298	1,846,101	1,967,773
Aluminium oxide & hydroxide	Tons	21,203	19,342	785,723	728,412
Aluminium sulphate	,,	28,113	24,410	368,622	332,072
Other al. cpds.	,,	2,828	2,293	117,419	132,029
Ammonia	Cwt.	72,077	56,235	276,026	192,982
Ammonium cpds. (not fertilisers & bromide)	Tons	16,652	20,898	587,780	710,240
Arsenic compounds	,,	4,408	4,588	299,610	307,561
Bismuth compounds	Lb.	312,779	358,048	246,028	277,655
Chloride of lime	Cwt.	263,331	194,778	471,786	356,002
Hydrosulphite	,,	72,679	60,797	565,042	468,626
Other bleaching mats.	,,	186,779	159,841	858,477	697,754
Calcium cpds.	,,	317,045	312,589	607,538	693,714
Carbon blacks	,,	947,742	712,920	3,440,878	2,565,766
Cobalt cpds.	,,	13,084	14,452	327,219	353,399
Iron oxides	,,	91,430	78,345	290,938	254,224
Lead cpds.	,,	54,313	56,897	263,247	257,140
Magnesium cpds. (n.e.s.)	Tons	13,407	15,122	747,171	795,744
Nickel salts	Cwt.	81,994	66,264	761,065	643,876
Potassium cpds.	,,	60,882	59,439	528,136	504,687
Sodium bicarbonate	,,	605,762	544,978	564,052	477,482
Chromate & dichromate	,,	22,705	43,607	106,066	187,113
Phosphates	,,	227,431	271,046	850,602	805,768
Silicate (water glass)	,,	212,480	312,881	212,578	319,521
Other sodium cpds.	,,	1,315,098	1,159,110	2,671,508	2,580,102
Tin oxide	,,	5,845	7,798	214,421	311,377
Zinc oxide	Tons	5,909	7,124	482,921	504,125
Inorganic chemical elements & cpds. (n.e.s.)	Value	—	—	3,948,729	4,299,858
ORGANIC					
Acids, anhydrides, salts & esters	Value	—	—	2,322,201	2,837,474
Glycerine	Cwt.	24,008	38,864	289,365	376,535
Ethyl alcohol, etc. & alcohol mixtures (n.e.s.)	Value	—	—	3,139,200	2,800,361
Acetone	Cwt.	64,767	116,291	184,232	313,016
Citric acid	,,	47,040	68,679	401,050	550,024
Gases, compressed liquefied or solidified (n.e.s.)	Value	—	—	1,374,586	1,224,610
Phenol	Cwt.	203,925	229,847	1,284,704	1,315,227
Sodium cpds.	,,	33,198	27,920	531,622	514,091
Sulphonamides not prepared	Lb.	1,023,078	988,004	631,450	557,971
Dye intermediates (n.e.s.)	Cwt.	68,049	66,745	1,118,421	1,244,643
Organic cpds. (n.e.s.)	Value	—	—	16,967,116	18,069,796
Total	,,	—	—	57,486,336	57,162,199
MISCELLANEOUS					
Coal tar	Tons	56,150	51,663	613,018	556,859
Cresylic oil	Galls.	2,560,939	1,798,981	917,431	700,495
Creosote oil	,,	13,254,432	13,338,855	881,960	939,205
Other tar products	Value	—	—	507,153	540,205
Total	,,	—	—	2,919,562	2,736,764
Pigment dyestuffs	Cwt.	32,786	31,707	1,408,552	1,357,839
Other syn. org. dyes	,,	172,299	191,831	8,762,662	9,878,912
Drugs, medicines, etc.	Value	—	—	32,694,233	36,362,602
Essential oils, etc.	,,	—	—	1,673,455	2,324,969
Explosives	,,	—	—	7,268,128	7,498,956
Tetraethyl lead	Galls.	4,847,361	4,266,568	9,519,526	8,160,464
Gas & chem. machinery	Cwt.	124,862	163,849	3,167,232	5,976,506
FERTILISERS, ETC.					
Nitrogenous	Tons	157,466	116,060	2,179,689	1,537,154
Other mfd. fertilisers	Value	—	—	231,761	331,239
Disinfectants, etc.	Cwt.	281,146	321,669	4,411,312	4,936,089
Insecticides	,,	207,611	207,839	3,000,623	3,138,497
Fungicides	,,	73,955	89,983	927,274	989,942
Weedkillers	,,	59,963	60,538	882,765	953,724
PLASTICS					
Plastics materials	Cwt.	2,576,604	2,914,961	32,577,096	31,669,687
Of which acrylic sheet, etc.	,,	101,230	116,419	3,047,559	3,361,322
Alkyd resins, etc.	,,	85,765	89,142	833,289	886,902
Aminoplastics	,,	281,386	284,457	2,135,018	2,040,350
Cellulose plastics	,,	83,325	70,367	1,696,245	1,602,014
Phenolics & cresylics	,,	223,624	364,412	3,264,046	3,146,807
Polystyrene	,,	154,476	223,982	1,627,981	2,076,661
Polythene sheet, etc.	,,	27,082	25,363	543,782	439,180
Polyvinyl chloride	,,	523,503	584,953	5,949,741	6,188,937

IMPORTS

		QUANTITY		VALUE	
		January-September 1960	January-September 1961	January-September 1960	January-September 1961
INORGANIC				£	£
Boric acid	Cwt.	102,253	58,408	327,470	190,706
Arsenic trioxide	Tons	5,121	3,552	160,123	106,915
Aluminium oxide	,,	19,863	11,650	1,246,009	726,061
Silicon carbide	,,	10,550	9,515	1,129,991	937,230
Borax	Cwt.	417,062	352,390	885,382	877,700
Calcium carbide	,,	1,629,635	1,220,660	2,797,312	2,173,405
Channel black	,,	106,546	100,718	735,588	726,380
Other carbon blacks	,,	125,633	123,633	557,345	624,378
Cobalt oxides	,,	11,389	13,402	478,046	559,574
Iodine	Lb.	1,099,931	1,247,178	363,153	477,637
Mercury	,,	1,373,337	1,618,286	1,250,490	1,385,540
Sodium, calcium, potassium, lithium	Cwt.	340	230	23,702	22,182
Potassium carbonate	,,	113,568	87,966	355,987	265,758
Selenium	Lb.	228,186	221,324	533,181	479,040
Silicon	Tons	6,904	5,368	1,063,802	907,219
Sodium chlorate	Cwt.	96,807	84,060	259,300	264,198
Titanium oxides	,,	23,369	16,512	134,889	151,132
Inorganic chemical elements & cpds. (n.e.s.)	Value	—	—	6,535,544	6,156,927
ORGANIC					
Acids, anhydrides, salts & esters	Value	—	—	4,673,730	2,478,192
Glycerine	Cwt.	109,478	88,466	859,232	530,299
Menthol	Lb.	140,344	116,658	310,500	267,361
Alcohols & mixtures (n.e.s.)	Value	—	—	3,535,873	2,413,882
Spirits of turpentine	Galls.	536,804	355,566	123,380	66,353
Styrene monomer	,,	2,365,506	2,700,356	962,061	1,008,581
Vinyl acetate monomer	Tons	6,030	5,985	678,849	647,996
Organic cpds. (n.e.s.)	Value	—	—	20,439,337	22,407,556
MISCELLANEOUS					
Syn. organic dyestuffs	Cwt.	37,752	41,014	3,485,017	3,859,166
Drugs & medicines	Value	—	—	3,837,083	4,142,896
Plastics materials	Cwt.	1,405,126	1,194,075	22,223,663	20,492,789
Of which Acrylics	,,	63,229	64,840	1,088,670	959,529
Alkyd resins, etc.	,,	44,651	42,794	455,416	413,794
Cellulose plastics	,,	78,367	70,518	3,772,777	3,609,047
Polyamides	,,	47,915	73,035	1,693,383	2,479,237
Polystyrene	,,	173,316	54,214	1,879,770	748,772
Polyvinyl chloride	,,	436,283	437,303	5,004,560	4,177,490
FERTILISERS					
Nitrogenous	Cwt.	2,938,764	3,266,980	2,156,349	2,389,893
Basic slag	Tons	58,377	39,827	469,601	307,288
Potassium chloride	Cwt.	10,598,344	10,335,369	7,882,934	7,762,833
Potassium sulphate	,,	349,172	334,391	291,530	280,143
Other fertilisers	Value	—	—	1,329,324	2,092,143
Disinfectants, insecticides, etc.	Cwt.	33,011	29,886	1,000,736	759,322

TRADE WITH PRINCIPAL MARKETS

	IMPORTS		EXPORTS	
	Jan.-Sept. 1960 (£'000)	Jan.-Sept. 1961 (£'000)	Jan.-Sept. 1960 (£'000)	Jan.-Sept. 1961 (£'000)
Ghana	—	—	4,584	5,306
Nigeria	—	—	6,073	6,286
South Africa	1,904	1,928	9,939	9,523
Rhodesia & Nyasaland	135	47	1,931	2,229
India	834	1,022	10,705	10,732
Pakistan	—	—	5,087	3,975
Kenya	85	68	2,247	2,406
Singapore	372	342	2,851	3,043
Malaya	237	170	3,743	3,601
Ceylon	213	120	2,974	2,740
Hong Kong	59	62	4,386	4,588
Australia	465	664	18,442	15,358
New Zealand	932	964	5,908	6,468
Canada	8,509	6,973	6,221	6,815
Soviet Union	458	864	4,805	2,722
Finland	—	—	2,911	3,229
Sweden	2,526	2,375	7,748	8,370
Norway	3,125	3,090	4,098	3,871
Denmark	771	825	4,408	4,913
Poland	1,328	1,238	1,026	2,176
West Germany	21,235	20,099	10,077	8,275
East Germany	2,366	2,084	—	—
Netherlands	10,161	10,429	11,817	11,339
Belgium	3,662	3,551	5,437	5,457
France	11,130	11,996	5,933	6,725
Switzerland	5,552	6,343	3,071	3,651
Portugal	1,105	1,089	2,582	2,881
Spain	2,218	1,838	2,125	2,022
Italy	4,937	4,890	7,967	7,920
Austria	—	—	1,054	1,312
Czechoslovakia	—	—	1,114	1,512
Turkey	—	—	960	1,506
Iran	—	—	2,544	3,065
Burma	—	—	2,138	2,080
China	396	410	2,334	1,341
Japan	958	1,242	2,514	3,556
United States	37,447	34,312	7,831	8,225
Argentina	684	501	2,092	2,794
TOTALS (all chemicals)	**131,059**	**127,765**	**235,967**	**242,438**

A CHEMICAL GROUP LOOKS AT EXPORTS

Albright and Wilson intensify sales drive in Europe

Filling perfumery packs for Eastern markets at Abrac aromatics division

BRITISH entry into the European Economic Community will mean a sudden and in some cases fairly drastic lowering of chemical tariffs so far as other E.E.C. countries are concerned. This will intensify competition from the chemical industries of Belgium, France, Italy, Netherlands and West Germany. It will also provide U.K. chemical manufacturers with a new home market in the most industrialised countries of the Continent.

How is the British chemical industry facing up to the challenge of operating in the world's fastest growing market? To recount the story of every company would take too long in one article, so "Chemical Age" has chosen one company to represent the whole. Albright and Wilson Ltd., a company which has expanded, partly through mergers, into a large group, whose interests cover a wide range of organic and inorganic chemicals, is an appropriate choice.

Like most large chemical groups, A. and W. are not waiting for Britain's Common Market entry to become fact, but have for some time been preparing the ground for more intensive promotion of their activities in West Europe—by setting up a manufacturing unit in Italy, Marchon Italiana S.p.A.; intensifying sales activities and advice; increasing companies' advertising.

The Group's exports, representing 20% of total sales, amounted to nearly £9 million in 1960, or a trebling of overseas sales in a period of six years. Much of that total goes to Europe where sales are expanding at a faster rate than in other areas of the world.

Albright and Wilson do not think that British manufacturers are at any significant disadvantage with European competitors either in raw materials or in plant efficiency. In fact, for A. and W. traditional products, notably in the phosphates group, prices in Germany, France and Italy are higher than in this country. The Group is therefore not afraid of any general lowering of U.K. tariffs, which should lead to higher sales in the C.M. area.

The only handicaps facing chemical exporters are not of their making. The hydrocarbon oils duty, for instance, is an unjustifiable burden on the industry. There is also the problem of the British transport system and the size of British ports. Improvements are long overdue.

Home sales are expected to be maintained for phosphoric acid, phosphates, sulphuric acid, plasticisers and silicones, either with or without tariffs, although on a few products some marginal reductions might have to be faced.

Most important of the Group's 500 export products is sodium tripolyphosphate for use in the synthetic detergents industry, sales of which probably makes A. and W. the world's leading detergent phosphate exporters.

In some fields, such as perfumery, chemicals and flavours, for example, the question of prices is not so important as the ability to supply the precise needs of the customer and to give adequate technical service. The company's position in one part of this field has been strengthened by an agreement with the Glidden Company of the U.S. under which certain perfumery chemicals can now be produced from 'simple' raw materials based on pinene, resulting in lower and more stable prices than could be achieved with the more 'exotic' raw materials.

In the first six months of this year, A. and W. Group exports totalled £4.7 million, compared with £4.3 million on the same period of 1960. The 1960 total was £8.8 million. These figures include exports of W. J. Bush and Co. Ltd., latest newcomer to the A. and W. Group, whose sales abroad are proportionately higher than those of any other Group company.

The increase in exports shown in the first-half of this year was one of 8.5% which compares most favourably with the increase of 3.7% recorded for the whole U.K. chemical industry over the same period. Considering the growing competition, this is a fine achievement, particularly bearing in mind the fact that prices over a wide range of products have been reduced.

A feature common to all companies in the Group is that demand in the C.M. is growing more rapidly than in the Commonwealth or rest of the world. This fact underlines the vital need of

Genoa, Bangalore, Amsterdam, Moscow, Sydney are among addresses to be found on silicone packages at Midsil's Barry works

the chemical industry to join the Common Market. As matters stand, the rising external tariff of some C.M. countries would effectively exclude British chemicals from those markets, despite any present price advantage.

This was doubtless one of the reasons why, long before the British approach to the Common Market authorities, the Group decided to set up Marchon Italiana, a small production base in Italy. This venture is important because it is the Group's only manufacturing facility in Europe so far and can be expanded as required.

Albright and Wilson have had an active export department since 1934 and there is today a keen and enterprising interest among all the subsidiary companies. A. and W. see exports not only as a means of ensuring Britain's economic survival, but also of raising total tonnage of chemicals produced and keeping output at the highest possible level, thus cutting overheads and overall production costs.

Within the last few weeks, Albright and Wilson (Mfg.) Ltd., the principal operating company, have launched an advertising campaign in international French and German language journals, aimed at general promotion of the company's name and its whole range of products. Early in the New Year the campaign will probably be directed towards particular markets, such as plastics and metal finishing.

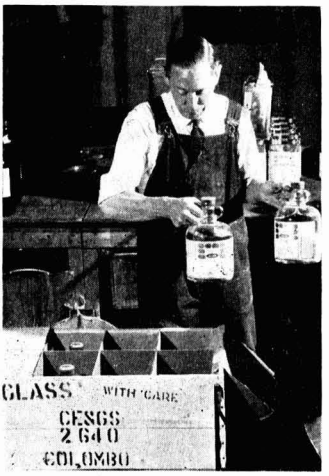
Industry within the C.M. is already becoming highly efficient because of fierce internal competition, leading to big combinations cutting down the costs of research, production and distribution. Chemical producers in Europe will be able to sell large quantities of goods in all world markets, at relatively low costs, much as the large U.S. companies do today. This will obviously affect the Group's overseas trade, but once the U.K. is in the Common Market, removal of tariff barriers will enable the Group to compete on equal terms.

This emphasis on Europe does not mean that A. and W. activity will be limited to the Continent. Company policy is to have a world-wide export business, although the overseas territories, including those in the Commonwealth, are today much less dependent on imports from the U.K. European competitors are now fully active in all those territories, even in such traditionally pro-British markets as New Zealand.

The six main members of the Group are actively building their exports in other parts of the world. They employ a total of some 300 agents overseas. This network is kept informed about new products and their uses through literature printed in the appropriate language, closely followed by visits from representatives, often in pairs, of whom one man is technically trained.

Knowledge of two or more languages is regarded as a great asset in building goodwill with agents and their customers. The list of visits overseas runs into hundreds a year, for there is no substitute for personal contact between producer and customer.

Recently A. and W. (Mfg.), Midland Silicones, and Boake, Roberts have opened up new business in the Soviet bloc. Marchon have also established excellent relations with Soviet Russia and are, with Constructors John Brown, erecting two plants in the Ukraine for the production of detergent materials. Albright and Wilson believe there is great potential in Communist markets, but the rate of expansion is still an unknown quantity.



Packing for export at W. J. Bush

One of the best means of extending overseas trade, certainly in the Soviet bloc is by means of exhibitions and the most ambitious undertaking so far was the Marchon stand at the British Trade Fair in Moscow. Midsil also took part.

Markets in some of the more remote areas of the world have recently been given more attention and products ranging from red phosphorus and synthetic menthol to perfumery chemicals and detergent materials have been sold in growing volume to Hong Kong, Mainland China, Japan and the Philippines.

In addition to activity in these markets, A. and W. have overseas companies in Canada, Australia, India and South Africa, and as recently reported in CHEMICAL AGE the Group brought its first-ever fertiliser complex into operation at Port Maitland, Ont., through the Canadian production subsidiary, Electric Reduction Co. of Canada Ltd.

Albright and Wilson's confidence that they will take an increasing share in world export markets is soundly backed by progress in the past two years. The company's issued capital, £36 million in 1960, was more than four times that of 1950, while sales (currently about £50 million) have also quadrupled during the same period. The Group has therefore expanded at about twice the average rate for the British chemical industry as a whole—no mean feat when it is remembered that in the same decade the chemical industry expanded at double the rate for all British manufacturing industry.

Laporte safety pack for organic peroxides

A NEW 5-gall. safety pack, first demonstrated at Interplas, has been introduced by Laporte Chemicals Ltd. for their liquid organic peroxides.

The pack, 10 in. by 10 in. by 17 in. high, is of light mild steel with an inner container of special grade polythene resistant to possible chemical reaction. Its weight, empty, is 8 lb. The pack occupies the absolute minimum space; is simple to handle; is safe during filling, moving and discharging, and is of attractive, as well as practical, design.

It has been fully approved by the Ministry of Transport as part of a new schedule of export packages for all organic peroxides.

Features of the new pack include: (1) An interrupted chimb at the top preventing retention of any liquid from external sources. (2) Safety closure, comprising a plastics cap incorporating a specially designed pressure relief vent. While not permitting any leakage of the contents, this vent will allow any pressure build-up to be relieved at about 1 p.s.i. (3) A flame arrester cap.

The pack has been tested up to a pressure of 70 p.s.i.


Laporte's new safety pack

Roll of chemical merchants

(*Continued from page 813*)

value as far as possible by manufacturing processes, and to export as high a proportion as possible of the products. Indeed, the imported raw material and the exported product may well be handled by the same merchant, and while the chemical manufacturer is engaged in providing the nation's bread and butter, it is the merchant who spreads the jam.

If the individual activities of all the merchants are considered together as a whole, it will be seen that they make a very significant contribution to the prosperity of the community, particularly as a result of their exports. Their efforts, therefore, deserve more recognition in Government circles than they usually get.

Would it be too much to expect regulations to show more consideration for the merchant's point of view, which is too easily overruled by the producer, the consumer, and the tax gatherer?

Monsanto know-how for Israeli p.v.c. plant

FOLLOWING a recent agreement, Monsanto Chemicals Co. will supply technical aid to Electrochemical Industries Ltd., Acri, in the construction of a $3 million plant for the production of p.v.c. Initial output is scheduled at 10 tonnes/day, but this figure may be doubled. Equipment will probably be imported from the U.S. The plant is due on stream in 1963. It is presumed that ethylene, for ethylene-dichlorate, will come from the petrochemical plants which are being erected by a U.S.-Brazilian-Israeli consortium at a cost of $15 million.

Paid up capital of Electrochemical Industries totals $3.4 million, provided by American Electrochemical Industries, French, Swiss and Israeli investors. At present the company operates plant at Acri for the production of chlorine, caustic soda, etc.

Capacity of the Eilat-Haifa pipeline is being increased from 1.7 million to 2.9 million tonnes/year by the installation of a 4,000 h.p. pumping station near Eilat. As consumption of petroleum in Israel totalled 1.7 million tonnes last year and may reach 1.8 million this year, there is a considerable margin for future expansion. A large proportion of this will be utilised in petrochemical plants.

The Palestine Economic Corporation, New York, reports that additional investments totalling about $5 million will be made in various Israeli companies. Of that total $1.5 million are intended for the Dead Sea Works for potassium projects; $600,000 for Israel Petrochemical Industries of Haifa to set up production units for ethylene, polythene and carbon black with participation by U.S., U.K., Brazilian and Israeli capital; and $1.45 million for the production of plastics materials, paper and paints.

The Dead Sea Works plan to raise potash production to 600,000 tons by 1965 and to 1 million tons in the following years; and to increase bromine output to 10,000 tons/year; to erect plant to produce 75,000 tons/year of magnesite plus plant for annual production of 20,000 tons of various bromides.

Other items in Israel's development programme include the diversification of production by Fertilizers and Chemicals Ltd.; the doubling of copper output by Israel Mining Industries and erection of plant for the refining and smelting of copper and production of copper sulphate; erection of plant for production of alumina by Negev Ceramics Materials Co.; beneficiation of phosphates by Negev Phosphates Co. at Oron by means of calcination up to 38% P_2O_5, raising capacity to 200,000 tons/year plus erection of plant for defluorinisation of phosphates for animal feedstuffs, as well as new plant for 60,000 tons/year of caustic soda, and units for the production of 100,000 tons/year of triple superphosphate.

So far some £130 million have been secured for the development of the Dead Sea Works. Output of the expanded plants and new units will in the next four to five years reach 1.4 million tons/year and will by 1970 total around 2 million tons. Greater part of that output is earmarked for export, with a value of $50 million a year at the end of the first stage, rising to $75 million.

Biological research director starts work

DR. LEON GOLBERG, whose appointment as director of the British Industrial Biological Research Association was announced in May, has now taken up his post at the new offices of the association at Radnor House, 93/97 Regent Street, London, W.1 (Gerard 2342). He has been joined by two recently appointed staff, the secretary **Mr. J. A. Bey,** and the information officer, **Mr. R. S. Forrest.** The Research Association was set up in 1960 with the support of a D.S.I.R. grant to carry out toxicological investigations on food additives and other substances which may be ingested in food and drink or from cosmetics. B.I.B.R.A. is at present negotiating for a site for laboratories and permanent offices, aiming at completion in mid-1963.

Meanwhile, the association may be able to carry out a limited research programme in borrowed laboratory accommodation and to begin to build up its research team. Until its laboratories are functioning, the association's main task will be to provide an information service for its members on food additives and related problems.

Chemicals and the Common Market

(*Continued from page 810*)

exports, the Japanese international chemical trade is also growing rapidly.

Table 3 compares growth (in U.S. dollars) of U.K. chemical exports from 1954 to 1960 with those of some other countries.

It is perhaps not surprising that an increasingly free flow of capital, know-how and ideas throughout the Western world should tend to reduce the predominance of any one country in export markets. Nevertheless, comparison with other countries' performances provides a useful counterweight to complacency induced by the sight of steadily rising export figures.

When U.K. chemical manufacturers see the buoyancy of the European industries and contemplate the benefits to be obtained from membership of a unified market, which compares most favourably with anything which the U.S. or the Soviet Union have to offer, it is no wonder that these manufacturers are among the foremost protagonists of Britain's entry into a united Europe.

I. Chem. E. secretary on engineers' proposals

A SUGGESTION, supported by the president of the Institution of Civil Engineers, that a high level co-ordinating board of the Institutions of Civil, Mechanical and Electrical Engineers, should be formed as a step towards an institution of chartered engineers "so powerful that the other chartered bodies could not afford to stand outside" has drawn a vigorous protest from Dr. J. B. Brennan, M.B.E., general secretary of the Institution of Chemical Engineers. In a letter to *The Times,* Dr. Brennan says "This is language reminiscent of the power politics of trade unionism at its worst. It bears little relation to the objects of a chartered professional engineering institution and it is not what one would expect from the venerable, if sometimes reluctant, father of British engineering institutions."

The I.C.E. president, Sir George McNaughton, had referred to this subject in his presidential address, pointing out that in 1929 more than 100 societies, institutions and associations existed for engineers and that this number had probably increased since then. Sir George supported the suggestion that a high level co-ordinating board be established to speak for the three major institutions on all matters of public interest and policy.

Union urges direct action against I.C.I.

The Transport and General Workers' Union, representing 5,000 men employed at the Wilton Works (Yorks) of Imperial Chemical Industries Ltd., have passed a resolution urging "direct action" against the firm for rejecting a wage claim by 50,000 labourers, employed in the I.C.I. organisation. More than half the 60 employees who became redundant when I.C.I. closed their acrylonitrile plant at Billingham-on-Tees have been found alternative work by the company.

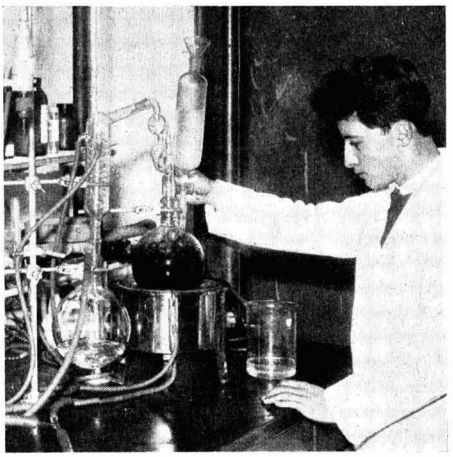
Obituary

Mr. Cornelius H. B. Rutteman, chairman of Hercules Powder Co. Ltd., died on 8 November in hospital, following a heart attack, aged 52. Born in Rotterdam, he first entered the service of the Dutch company, N. V. Hercules Powder Co., and was assigned to England in 1940 to serve the company's interests during the war. In 1944 he founded the U.K. company as a wholly-owned subsidiary of Hercules Powder Co., Wilmington, Delaware. Originally managing director of the U.K. company, Mr. Rutteman was appointed chairman in 1955. He was also a director of Holden Vale Manufacturing Co. Ltd., of Nelson's Acetate Ltd., and of the Portuguese company, Resiquimica.

Mr. Robert Davidson MacMillan, managing director of Controlled Heat and Air Ltd. (a member of the Incandescent group) died on 8 November.

Dr. H. M. Hirschfeld, former board member of the Dutch chemical concern Koninklijke Nederlandsche Zout and Noury en van der Lande, has died in Holland at the age of 62.

Lab.-scale production of rare chemicals provides unique service



A stage in the manufacture of 10-chlorodecanol

THE services provided by B. Newton Maine Ltd., Silsoe, Bedford, are unique in that they produce only chemicals which cannot be obtained anywhere else in the world, with the possible exception of the U.S.

Often workers require chemicals which are not readily available and are faced with the alternative of managing without or with the perhaps tedious business of making them. The company of B. Newton Maine was formed in 1958 to provide a source of just such chemicals. By gradually establishing contacts throughout the world, the company was able to bring out a catalogue of about 3,000 rare chemicals in 1961, and in August of this year, a subsidiary company was formed—B.N.M. Laboratories Ltd.—to manufacture those chemicals for which there appeared to be no source of supply, or for which the price of existing sources was prohibitive, as is sometimes the case with U.S. sources.

B.N.M. Laboratories make or obtain only chemicals for which there is a specific demand. The decision to manufacture is taken if the chemical cannot be obtained at an economical price and after consultation between the company and the prospective customer after the cost of manufacture has been established. The route to a particular chemical is decided upon from a study of the existing literature with possible refinements developed in the laboratory. The chemical is made to that standard of purity (usually between 95 and 100%) which can be obtained without unnecessary expense.

Up to now B. Newton Maine have concentrated on the U.K. market but an expansion of export business is the next step in the programme.

In Parliament

Pyrethrum among less effective pesticides, says Ministry spokesman

PYRETHRUM, one of the less toxic substances, was also among the less effective. This was stated by Mr. W. M. F. Vane, Parliamentary Secretary to the Ministry of Agriculture in the House last week in reply to Mrs. J. Butler (Lab., Wood Green).

In view of the increasing use of compounds that were toxic to humans, Mrs. Butler had asked if it were not urgent that the Minister should insist on raising the safety standards of pesticides, fungicides and seed dressings as well as positively encouraging the use of non-toxics such as pyrethrum?

Mr. Vane said that the Pyrethrum Board of Kenya was carrying out a number of research projects and was in touch with his department. There was certainly no evidence to show that the board, which was expanding its production, was not finding a useful outlet for all that it could provide.

Minister to be questioned on notification scheme

Notice has been given by Mr. John Farr (Con., Harborough) that he will ask the Minister of Agriculture in the Commons on 7 December what steps he is taking to revise the notification scheme regarding chemicals used in agriculture.

Letter to the Editor

Appleton and Howard's chemical pumps

SIR,—I was very interested to read your survey on pumps for the Chemical Industry in your edition of 28 October. Although very much in agreement with your article (p. 669) I must point out one error, and that is where you state "it seems anomalous that no one manufacturer appears to specialise exclusively in chemical pumps."

This company has, since the inception of its Pump Division, concentrated solely on the chemical industry and the handling of corrosive and difficult liquids. Although we do not produce in all the specific materials you mention, we do manufacture in at least 20 different materials of construction, and we make the claim that if a centrifugal pump is capable of handling the liquid, we have both the unit and the material of construction for the job.

Yours, etc.,
A. P. CAPPER,
Managing Director.
Appleton and Howard Ltd.,
St. Helens.

I.C.I. cut prices of injectable penicillins

FOLLOWING reductions recently made in the prices of certain antibacterial drugs, the I.C.I. Pharmaceuticals Division has now cut the price of its injectable penicillins by about 10%.

I.C.I. are one of the largest manufacturers of penicillin and were responsible for much of the early commercial development of this drug after its discovery by Sir Alexander Fleming.

Tar industry seeks stable, predictable market

A REALLY stable predictable market for tar which would not shoot up and down was one of the industry's aims declared Sir Henry Jones, president of the British Road Tar Association, at the recent annual dinner. On an objective assessment, the association was sure that tar supplying members could convince anyone present at the dinner that tar could do a job as good as any other road making material.

With the right opportunities, the tar industry could play an extremely important part in the Government's road programme, added Sir Henry.

Merchants seek C.M. trade in chemicals

Steps that should be taken to ensure that the distribution of chemicals in the European Common Market is carried out mainly through merchants were considered at a meeting held recently in Rome of the European Chemical Trade Federation. Taking part were the associations of chemical merchants of Austria, Belgium, France, West Germany, Italy, Netherlands, Portugal and Switzerland.

Overseas News

Soviet workers synthesise hydrogen peroxide from elements

INSTITUTE of General and Inorganic Chemistry imeni N. S. Kurnakov, Academy of Sciences U.S.S.R., reports the formation of concentrated (70 to 80% by weight) hydrogen peroxide from elements in a glow discharge under the following conditions; 3.5 to 3.7% oxygen by volume in the gas mixture; drying of the gas mixture by bubbling through concentrated sulphuric acid, followed by freezing in liquid nitrogen; a molybdenum or Pyrex glass discharge tube treated with hot, concentrated nitric acid and rinsed with distilled water, then treated again with concentrated phosphoric acid, rinsed with distilled water, and dried; holding the gas in the discharge zone for approximately three minutes; and −17° to −18°C. temperatures for the cooling medium around the discharge tube.

E.N.I. refinery equipment credit for Yugoslavia

E.N.I. have granted the Yugoslav Government a credit of $30 million which is to be utilised for the purchase of petroleum refining and allied equipment in Italy.

Austrian superphosphates plant on stream

Bleiberger Bergwerke-Union have started operating their new superphosphates plant in Carinthia, Austria, with total capacity of 30,000 tonnes/year.

Joint petrochemical venture for Allied Chemicals

A jointly-owned petrochemical complex is to be set up by Allied Chemical and Union Texas Natural Gas near Geismar, La., south of Baton Rouge, at an estimated cost of $40 to $60 million. Construction should be completed in the spring or early summer of 1963. Most of the feedstock, comprising LPG and natural gas liquids will come from the processing plant of Union Texas. Allied Chemical will take most of the output for further processing.

Isoprene from cheap, large volume source

U.S. patent 2,985,696 describes a process for the manufacture of isoprene from a readily available cheap large volume source, which involves the isomerisation and dehydrogenation of a C_5 hydrocarbon feed stream, recovery of 2-methylbutenes, and further dehydrogenation of the butenes. A composite catalyst consisting of a chromia-alumina dehydrogenation catalyst and a platinum-derived isomerisation catalyst is employed in the first reaction. The liberated 2-methylbutenes are contacted with a chromia-alumina dehydrogenation catalyst.

East German chemicals for Brazil

Contract for the supply to Brazil of 2 million marks' worth of chemicals for use in the glass, paint and textile industries has been secured by East German foreign trade agency DIA Chemie.

Phthalic anhydride plant for Puerto Rico

Stephen Chemical Co., U.S., are to erect a $7 million plant in Puerto Rico for the production of phthalic anhydride, the plant to be operated by the Stephen subsidiary Stephen Carbide Inc. Stephen have signed an agreement with the Puerto Rican firm Commonwealth Oil Refining Co. Inc. for the supply of naphthalene to be used as starting material. The phthalic anhydride unit will start production late next year.

Low-cost Abruzzi natural gas for chemical industry

Some 25% of the gas bed recently discovered by E.N.I. at Cupello in the Abruzzi Region, which should yield 1.6 million cu.m./day is to be utilised in the processing of petrochemicals. As an incentive to plant investment at Cupello, E.N.I. are to offer natural gas at reduced prices. (Natural gas in Southern Italy has been offered to chemical users at about 5 lire/cu.m., or around 1.75 lire/cu.m. cheaper than the price normally quoted for chemical feedstock usage).

Another 25% of gas output will be supplied to the newly developed industrial areas of Chieti and Pescara. The remaining 800,000 cu.m./day will be piped to Terni, for industrial use, and to Rome, for town gas.

Omaha furfuryl alchol plant for Quaker Oats

Chemical Division of Quaker Oats plans a new furfuryl alcohol plant in Omaha, Neb., which it is stated will double present U.S. capacity. Completion is scheduled for early-1962.

Japanese silicones plant completed

The Irifune silicones works of Tokyo Shiboura Electric Co. at Yokohama is now on stream utilising Dow Corning process know-how.

Union Carbide to lose film-making subsidiary

Under a new ruling of the U.S. Federal Trade Commission, Union Carbide must dispose of their film-producing subsidiary, Visking Corporation, who are reported to hold more than 50% of trade in polythene film. The company was acquired by Union Carbide in 1956.

Union Carbide may retain their new Cartersville, Ga., polythene plant, which will enable them to stay in the film business, and all Visking assets relating to production of synthetic sausage casings.

At the same time, Enjay Chemical, of the Humble Oil organisation are bidding some $1.7 million for Extrudo-Film Corporation, producers of polythene and polypropylene film.

Swedish producer expands formalin production

The Swedish producer Skanska Attiksfabriken A/S, which in 1959 started production in Perstorp, South Sweden, of formalin by a new process, has announced that a further production unit is to be built. The new plant will start operation in mid-1962.

Goodrich-Gulf syn. rubber licences for Japan

Goodrich-Gulf Chemicals Inc., Cleveland, U.S., have granted Ube Industries Ltd., of Japan, licences for the production of cis-polybutadiene and cis-polyisoprene synthetic rubber. The American company, a joint subsidiary of B. F. Goodrich Co. and Gulf Oil Corporation, has already given similar licences to Shell Chemical Co. Ltd., London, and Polymer Corporation Ltd., Sarnia, Canada.

Cabot TiO_2 agreement

An agreement has been signed between the Cabot Corp. of the U.S. and Fabrique de Produits de Thann et de Mulhouse under which Cabot have been granted exclusive rights in the U.S. for the use of FPC patents relating to the production of pigment grade titanium oxide by the flame chloride process.

Hoechst cracking agreement

Farbwerke Hoechst and their subsidiary, Knapsack-Grisheim, have signed an agreement with Union Rheinische Braunkohlen Kraftstoff by which Kraftstoff will build a cracking plant to produce ethylene and propylene at Wesseling near Cologne. The capacity will be 70,000 tons of ethylene a year and the plant is scheduled to go on stream in 1963. Hoechst will purchase most of the output.

Big new investment programme for Hungarian chemicals

Some 3,000 million forints are to be invested in the Hungarian chemical industry in the period 1961 to 1965; of this some 2,000 million forints will go to "general technical development" and the rest to automation of production. Stress-points of investment are synthetic fertilisers, plastics and pharmaceuticals, while Hungary intends to call a virtual stop to imports of synthetic fertilisers, plastics, chemical fibres and plant protection chemicals, thus saving some $U.S. 10 million annually.

Over the past decade some 20 new

chemical plants have been built in Hungary and, despite some cuts in new building programmes, the opening and modernisation of 33 chemical plants are planned.

The country's Central Chemical Research Institute has just been opened in Budapest. It incorporates 40 laboratories and a 14,000-volume library and will undertake research commissions, including work with the use of isotopes.

French synthetic rubber plant opened

Soc. des Elastomères de Synthese have opened their styrene/butadiene plant which will produce 50-70,000 tons a year for the French market. Any surplus will be exported to the Common Market countries. The plant represents an investment of NF100 million by Shell, Texas Butadiene and Houston Chemical. A share is also held by a leading French tyre manufacturer. The plant is almost fully automatic.

S.D. to design Australian carbon tet. plant

The carbon tetrachloride plant which Imperial Chemical Industries of Australia and New Zealand Ltd. are to build at Botany, N.S.W. (CHEMICAL AGE, 11 November, p. 765) will be designed by Scientific Design Co. Inc., New York. Hydrocarbon feedstock will come from a nearby refinery and carbon tetrachloride will be supplied for the production of chlorofluorocarbons.

I.C.I.A.N.Z. are one of Australia's biggest industrial companies and comprise the following operational groups: Nobel (explosives, ammonia, metals); Chemical (biological, general); Alkali; Dyes & Plastics; Plastics; and I.C.I. (New Zealand). Among I.C.I.A.N.Z.'s wholly or partly owned companies are Newcastle Chemical Co. Pty. Ltd. (with Broken Hill Pty. Ltd.) and Balm Paints Pty. Ltd., Australia's leading paint producers.

Yugoslavia expects to increase chemical imports

Until local production is expanded, Yugoslavia expects to import an increasing quantity of chemicals for the textile, rubber and leather industries. The major items concerned are lactic acid, formic acid, oxalic acid, stearic acid, dimethylamine, certain organic dyestuffs, titanium oxide, etc.

Imports now total about $3 million a year; demand for textile auxiliaries has been trebled since 1948, while demand for rubber and leather chemicals has increased six-fold. By 1965 expansion of local production is planned to rise by 76% compared with 1957.

Montecatini may also add titanium oxide to Indian plans

Following the announcement in CHEMICAL AGE for 4 November, of Montecatini's plans in India, it is now stated that an estimated 300 million rupees will be invested on these projects. The Italian firm plans to work with both State-owned and private firms and, unless the plants concerned work to totally new processes, will not attempt to become majority shareholder; holding are planned to be between 20 and 49%. Apart from the products mentioned initially it is now expected that titanium oxide will be produced under the scheme.

Canadian firm to build G.A.F. chlor-alkali extension

Vickers-Krebs Ltd., Montreal, are main contractors for the expansion of the Linden, N.J., chlorine-caustic plant of General Aniline and Film Corporation from 50 to 230 tons/day. G.A.F.'s Antara Chemical Division will operate the plant which will cost more than $10 million. Work will start next month and is due for completion early in 1963.

Japanese chemical industry planned in Italy ?

Showa Denko, of Tokyo, are understood to be negotiating with the Corsorzio per l'Area per lo Sviluppo Industriale group of Italy on the setting up of an industrial project in Taranto. It is not known exactly what form this scheme, which is to cost some 10,000 million lire, will take, but it can be assumed that it will be connected with chemical industry.

Ohio Oil co-operation for new German refinery

Wintershall AG, West Germany, with Ohio Oil Co., U.S., are to build a refinery on Friesenheim Island near the South German city of Mannheim with an annual throughput of 2 million tonnes of crude oil. An oil port is to be built in Mannheim itself connecting with the Marseilles-Carlsruhe pipeline. The Mayor of Mannheim has stated that the chemical industry in the Rhine-Neckar area in particular seemed able to consume the planned refinery's products. Construction of the refinery, which will be operated by Erdölraffinerie Mannheim GmbH (Wintershall 60%, Ohio 40%), will start next year and be finished by 1964.

Bayer set-up Australian pharmaceutical subsidiary

Bayer have established FBA Pharmaceuticals Ltd., a wholly-owned subsidiary with A£50,000 capital, in Sydney, N.S.W. Initially the new company will handle sales of Bayer products, but will later take up manufacturing operations.

Fluorine expansion for German firm

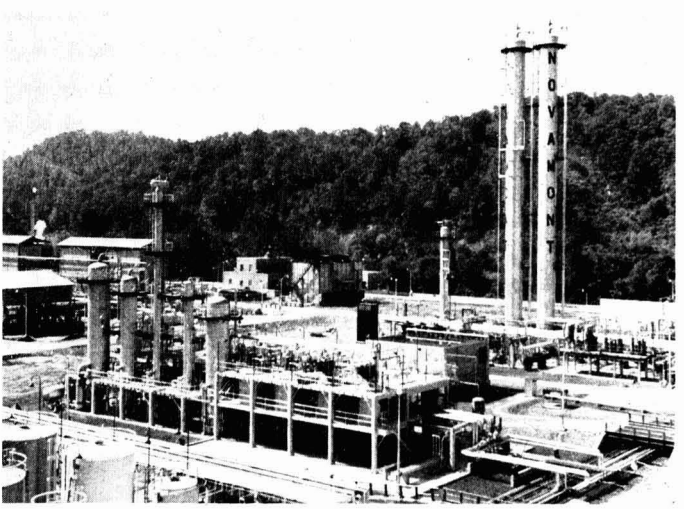
Saline Ludwigshalle AG, of Bad Wimpfen am Neckar, West Germany, are to expand their hydrofluoric acid plant opened in Bad Wimpfen last year and with it the whole production programme of fluorine compounds. The company obtains fluorspar from its subsidiary Flussspatwerk Schwarzenfeld GmbH.

E.N.I. petrochemical plant for Egypt

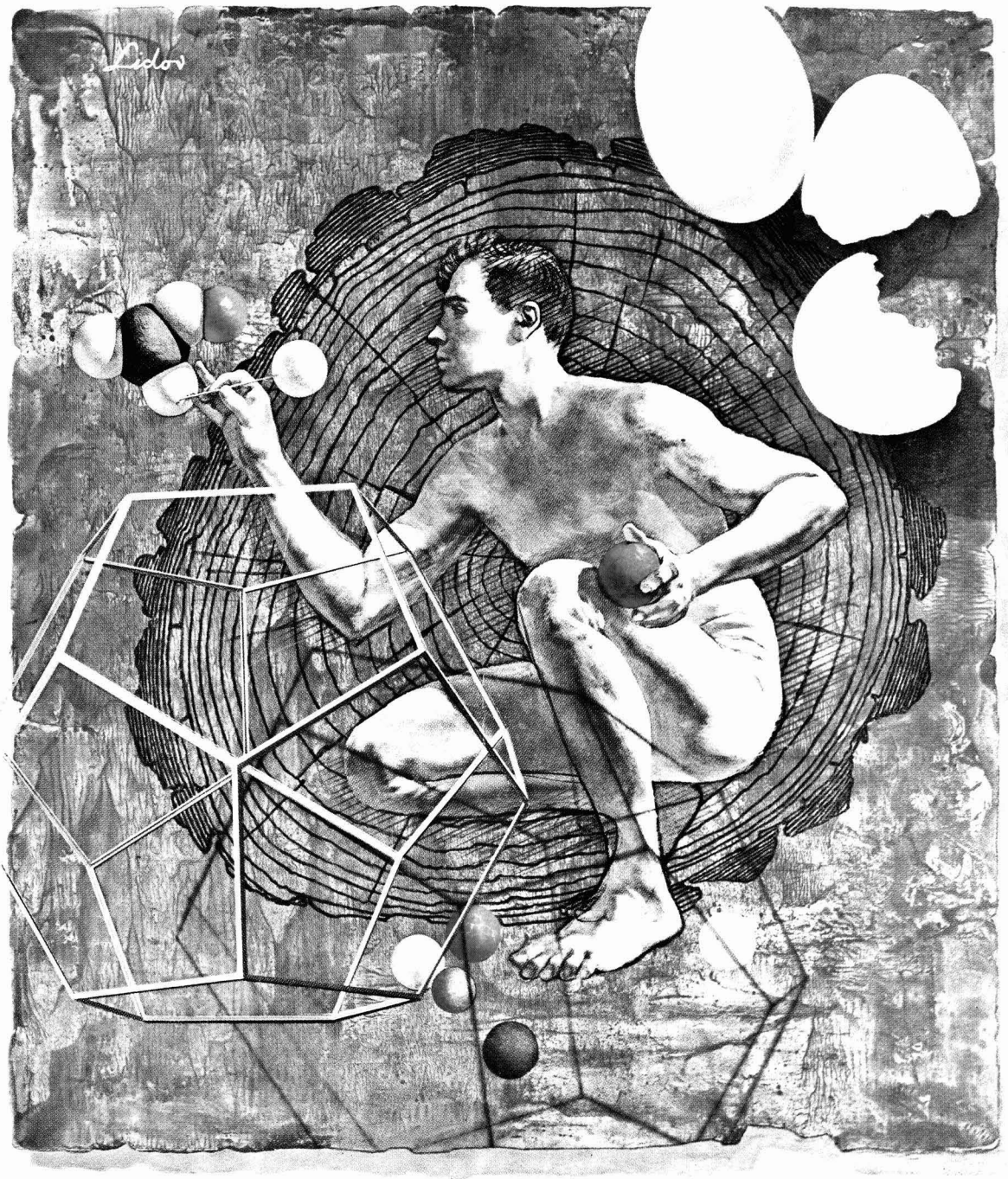
E.N.I. are to supply a petrochemical plant and off-shore drilling equipment to Egypt in exchange for Egyptian crudes. Value of the contract is $50 million.

The agreement also covers the supply by E.N.I. to its associate Compagnie Orientale des Pétroles (COPE) of equipmen to increase production at the COPE wells in Sinai from 2.5 million tons to 4 million tons in 1962 and 5.5 m. in 1963.

Montecatini's U.S. polypropylene plant



Section of Montecatini's new petrochemical plant at Neal, W. Va., U.S., where, as previously reported in C.A., production of polypropylene resin started in mid-October. The 30 million lb./year plant is operated by Novamont Corporation, Montecatini's U.S. subsidiary, and uses Montecatini-Natta patents. A plant to produce polypropylene film is also to be built at Neal



Probing the secrets of the atom is the endless preoccupation of the chemist. His discoveries affect the lives and fortunes of people around the world. Whether it be something as simple as a bleach or as complex as a new process for separating fuel oils, Dow chemists are constantly contributing new chemical products that help industry to operate more effectively and the consumer to live more enjoyably.

DOW

Radiation-induced polymers with double or triple bonds

MANY molecules that contain double or triple bonds in their chemical formulae do not form macromolecules under usual conditions. In general, attempts to polymerise such molecules cause a shift in the equilibrium towards monomer instead of polymer production, but workers of the U.S. National Bureau of Standards have found that by exposing substances to gamma radiation under high pressures, solid polymers can be obtained from monomers which at best normally produce oils. The programme, which was originally initiated to increase knowledge of radiation and polymerisation kinetics and mechanisms, may provide a basis for the production of new types of polymers.

Initial studies have been conducted on *n*-perfluorheptene-1, α-methyl styrene and carbon disulphide. The degassed liquid monomers are distilled under vacuum to a detachable pressure bomb and compressed under high pressure before being exposed to gamma radiation.

The bomb is designed to withstand pressures of 10,000 to 15,000 atm. for an extended period of time. Additional bombs now being made will permit studies at 30,000 atm. and 25°C and at 10,000 atm. and 400°C.

After the required amount of pressure has been applied, the pressure vessel is lowered into a pool and irradiated for a specific time with either a 1,200-curie or a 50,000-curie cobalt-60 source shielded by water.

Medium mol. wt. polymer

When perfluoroheptene was subjected to the appropriate pressure and radiation, a moderate amount of medium-molecular weight polymer was obtained. Molecular weight is higher at the lower dose rates. Thermal decomposition studies for the highest melting sample indicate a number with average molecular weight exceeding 5,000.

The polymerisation rate of α-methyl styrene seems to depend primarily on the dose rate. No polymer was obtained when the monomer was irradiated at normal pressure but at 10,000 atm. and 25°C, 18 molecules of monomer were converted to high polymer for every 100 eV. of energy absorbed from gamma radiation. The molecular weight of this material as determined by the viscosity method is approximately 50,000.

The yield of polymer from carbon disulphide at 15,000 atm. and 25°C was small when a low dose rate was used. Irradiation at higher dose rates and 100°C improved the yield.

Although the data gathered in the preliminary experiments are not sufficient to warrant detailed conclusions, some general theories have been formulated. Predictions of the effect of pressure on individual rate constants are based on the assumption that the volume in the transition state is intermediate between the volumes of the reactants and the products. Thus, the rate constants for propagation and termination are predicted to increase exponentially with pressure, whereas the rate constant for dissociation of a molecule into free radicals will decrease. As pressure represses the production of free radicals, the chance of radicals colliding and recombining into small molecules instead of macromolecules declines. Therefore, it is assumed under specific conditions of pressure and irradiation, sufficient collisions occur between molecules to support the polymer growth.

The monomers and fragments produced by radiation must be able to diffuse through the medium in order to combine. Because the application of high pressures produces a more viscous and less diffusible material, the temperature of the substance must be raised enough during the experiment to overcome such an effect. Thus, a moderate constant temperature is maintained throughout the experiment to prevent crystallisation and to promote diffusion. If the material is in the liquid phase, with propogating centres surrounding the monomer molecules, diffusion should be no problem.

First European Plastics and Rubber Conference

THE first European Plastics and Rubber Conference, to be held in Paris from 18 to 29 May, 1962, will illustrate the progress of the scientific and industrial aspects of plastics and the part played in their development by the various European countries. Papers read in German, English, French and Italian will be accompanied by simultaneous translations in each language.

The conference will be held in the U.N.E.S.C.O. Palace. Further information can be obtained from Du Mont Publicity Co., 18 Queensberry Place, London S.W.7.

Southern Analytical to make instruments developed by W.P.R.L.

Manufacturing licences for instruments developed at the Water Pollution Research Laboratory for the automatic measurement of suspended matter and dissolved oxygen concentration have been granted to Southern Analytical Ltd., Frimley Road, Camberley, Surrey, by the National Research Development Corporation. Southern Analytical are already in production with the dissolved oxygen meter (see also CHEMICAL AGE, 21 October, p. 633).

Will

Mr. W. S. Harris, governing director of Hough, Hoseason and Co. Ltd., Atlas Laboratories, Chapel Street, Levenshulme, formerly joint managing director of E. Griffiths Hughes Ltd., who died on 25 May, left £18,640 net (duty paid £2,239).

ECONOMIC TRENDS AND TECHNICAL DEVELOPMENTS IN AEROSOLS

Discussed at Lucerne conference

THE third international aerosol congress was held in connection with the first aerosol packaging competition and the first international aerosol exhibition in Lucerne, Switzerland, in October. Organisers were the Federation of European Aerosol Associations, of Zurich, Switzerland, whose members are the International Aerosol Association, also of Zurich, and French, West German, Spanish and Finnish associations; the International Aerosol Association has several British firms as members.

M. François Harlan, president of the F.E.A. and on the staff of Ets. de Trevise, Colombes, France, said that the sale of some 200 million aerosol units is expected this year in the U.K., France, West Germany and Italy, taken as a whole; this compares with 149 million units last year and only 98 million in 1959. Insecticides take up between 25 and 50% of total aerosol-packed production, leading the field in all countries except West Germany. After insecticides in order of importance come hair lacquers, room-air refreshers and sun protection media. The use of butane as aerosol propulsion gas is at its highest in France, where it accounts for 30 to 40% of all such gas.

Dr. Kurt Jacobix, of J. A. Schmalbach AG, Brunswick, West Germany, gave the share of various materials in the production of aerosol packages in Europe as: steel, 65-70%; aluminium, 25-28%; and glass and plastics, 7-10%.

M. J. Morelle, of Paris: Etheric oils can possess strong room-air disinfecting properties, in some cases as efficient as those of mercury salts; thus, thyme is some eight times stronger than phenol and eugenol as much as 16 times stronger as far as disinfectant qualities are concerned. Eucalyptus oil has a very high degree of disinfectant efficiency and coniferous oils are comprehensive disinfectants, though these do not sterilise. Studies of the disinfectant degree of various glycols led to the interesting finding that this was dependent on air humidity; at a certain humidity content no disinfectant action exists. Propylene glycol was proved to be an efficient disinfectant. In a discussion following M. Morelle's paper, it was stated that lavender oil had approximately the same disinfectant qualities as phenol and considerable aromatic advantages over thyme oil and eugenol.

Professor Dr. J. J. Sciarra, of New York: Last year some 11,500,000 aerosol packages were produced for the pharmaceutical and medicinal branch in the U.S.; this figure was 17.5% above that for 1959 and 44.8% over that for 1958. Suggested recipes for pharmaceutical aerosols included propulsion gas contents of 89.8% for foot spray, 50% for antibiotic spray, 70.1% for burn spray, 99% for angina spray, 65% for asthma spray of 33.1% ethanol content and 63.9% for asthma spray of 35.75 ethanol content, the gases in some cases being of gas mixtures.

Count R. Scribani Rossi, of Rome, Italy: Last year some 23.5 million aerosol packages were produced in Italy, of which 46.7% were for insecticides and 18.7% for hair lacquers. Some 57.5% of all aerosol packages in Italy are of the aluminium-monobloc type.

M. Claude Franck, of Compagnie Parisienne de Conditionnement Aérosol, Paris: Some 6 million spray packages with nitrogen propulsion were sold in France last year and some 10 million such packs are expected to be consumed in 1961.

Mr. B. Medlundh, of Stockholm, said that the advantages of 'cold' filling of aerosol packs were high filling speeds even with high propulsion-gas contents and the use of all valve types. Its disadvantages are high capital cost, the impossibility to charge with certain products due to the super-cooling and the impossibility of using inflammable propulsion gases.

Dr. W. Roth, of Basle, and *Dr. U. Ferranti,* of Milan, stated in a joint paper: The 'closed-drum' test, whereby the minimal explosion point of an aerosol pack is tested, shows that only compounds with 0% and 10% inflammable contents were explosion-proof, all others exploding within a minute when sprayed into a 200-litre drum containing a candle. Inflammable solvents and inflammable propulsion gases played an equal part in the positive result of a test; the flame length is dependent on the per cent content of inflammable material present, though it makes no different whether this is in the form of solvent or gas. The speakers, who also reported on the "flame projection test" for flammability, stated, however, that the type of spray head used influenced the degree of inflammability of an aerosol product.

New Westinghouse development may speed space applications for tungsten

DEVELOPMENT of a practical method for producing large single crystals of tungsten, which, moreover, are of extremely high purity and density, is claimed by the Westinghouse Electric International Co., New York, as a major step forward in the tungsten field which may have an important impact on the U.S. space programme.

Tungsten rods 10 in. long and 0.2 in. in diameter are being produced as single crystals. Special refining techniques have been developed by Westinghouse engineers which even make it possible to grow these ultra-high purity crystals in predetermined crystalline forms with a purity up to 99.9975%. The large crystals of tungsten are big enough to permit the commercial fabrication of small parts from them.

Tungsten is usually considered a hard brittle metal very difficult to machine or fabricate. However, Westinghouse engineers have shown that ultra-pure single crystals are actually ductile, even at temperatures as low as −330°F. They have proved that ductility depends upon purity. This discovery points to the possibility of a major breakthrough in commercial fabrication.

High purity single crystals are of particular value in studies of fundamental properties of high temperature metals. Tungsten, having the highest melting point and the greatest strength of all the metals, is a promising material for applications such as rocket motors. Much remains to be discovered about its behaviour, but the availability of superior tungsten single crystals opens the door wide to advanced research, he said.

The development sprang from the need of Westinghouse research engineers for more knowledge about the fundamental properties of tungsten—a key component in products of the lamp, electronic, and missile industries. Tungsten metal suitable for such studies was not available, so Westinghouse engineers designed unique zone melting equipment using the electron beam principle of heating in order to produce bigger and superior crystals. However, to attain the ultra-pure single crystals, it was necessary to first develop a process for making special high purity tungsten ingots. These high purity ingots are used in the zone melting process as the starting material from which the single crystals are grown.

Ironically, after the extreme high purity tungsten crystals were attained, Westinghouse engineers found that existing analytical techniques were not adequate to obtain precise measurements of gases and metallic impurities when they are present in only a few parts in a million. As a result, advanced methods of optical spectroscopy, vacuum fusion and neutron irradiation analyses were developed to verify the infinitesimal amounts of impurities.

The single crystal tungsten is available commercially.

Will

Mr. Samuel Henshaw, F.R.I.C., chairman of the National Benzole Co. Ltd., 1919-42, former director of Staffordshire Chemical Co. (1917) Ltd., and other companies, who died on 6 August last, aged 92 years, left £89,464 net.

PEOPLE in the news

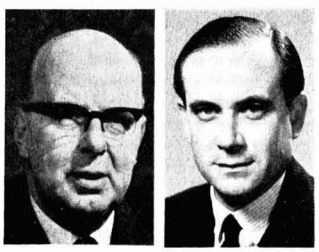
● **Dr. J. Kymmell,** who has been appointed economic advisor to the I.C.I. European Council, set up earlier this year to manage the company's interests in Europe, is director of European integration in the Netherlands Ministry of Foreign Affairs. Aged 40, Dr. Kymmell is also Professor Supernumerary of International Economic Relations, Rotterdam.

● **Mr. W. F. Matheny,** a chemical engineering consultant of Calgary, has been appointed to the executive staff of Pacific Petroleum as a management advisor on petrochemical development.

● **Dr. Mansel Davies,** senior lecturer in chemistry at University College, Aberystwyth, has been granted the title of reader in the University of Wales.

● **Mr. Miles L. Haselden** has joined the board of William Blythe and Co. Ltd., Church, near Accrington, Lancs. **Mr. J. Meakin** has been appointed secretary in succession to **Mr. C. E. M. Cheetham** who was recently appointed managing director.

● **Mr. Donald H. Brewer** and **Mr. Ralph M. Knight,** vice-presidents of Rexall Drug and Chemical Co. have been appointed to the board.



J. Strong (left) became chief executive, Special Projects Division, while R. C. Hesketh-Jones (right) became chief executive, Sales Division of the British Oxygen Co. Ltd. under recent executive board changes (C.A., 4 November, page 716)

● **Mr. Norman Care,** general sales manager, Aberdare Holdings Ltd., and general manager, South Wales Switchgear Ltd., has been appointed a director of the Neckar Water Softener Co. Ltd., a member company of the Aberdare Group.

● **Mr. John S. Dartnell,** who has been appointed merchandising manager of AviSun Corporation, Philadelphia, Pa., joined AviSun from Scott Paper Co. The appointment is announced by Dr. W. Paul Moeller, director of marketing. A graduate of New York University, Mr. Dartnell also attended Dartmouth College and the graduate schools of Columbia University and Pittsburgh University. A U.S. Navy veteran of World War II, he returned to active service in 1950-52 as public information officer for N.A.T.O. AviSun Corporation, an equally-owned affiliate of American Viscose and Sun Oil Co., are leading producers of polypropylene. Their newly-opened polypropylene polymer plant at New Castle, Del., is the largest in the world, having an annual capacity of 100 million lb.

● The Davy Medal has been awarded by the Royal Society to **Professor D. H. R. Barton, F.R.S.,** professor of organic chemistry at the Imperial College of Science and Technology, University of London for his distinguished researches in organic chemistry, particularly on the structure and stereochemistry of natural products of the terpene and steroid series, and the analysis of the conformation of cyclic structures.

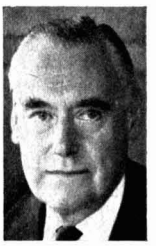
● The Royal Society has also announced the award of the Copley Medal to **Sir Hans Krebs, F.R.S.,** Whitley professor of biochemistry at Oxford University for his contributions to biochemistry, in particular his work on ornithine, tricaboxylic acid and glyoxylate cycles.

● **Mr. R. Hofmann** and **Dr. K. Riess** have retired from the managing board of Farbenfabrieken Bayer AG, Leverkusen.

● **Mr. A. K. Ames,** assistant sales manager of I.C.I. Dyestuffs Division, was elected chairman at the annual meeting of the British Colour Makers' Association held recently in London. Other officers elected were: vice-chairman, **G. E. Hillier** (J. W. and T.A. Smith Ltd.); hon. treasurer, **Sir Christopher Cowan, J.P.** (Cowan Bros. (Stratford), Ltd.; council, **A. K. Ames, Sir Christopher Cowan, J. A. Dodd** (British Paints Ltd.); **H. Gosling** (Cornbrook Chemical C. Ltd.); **J. H. Grimshaw** (Horace Cory and Co. Ltd.); **G. E. Hillier; C. L. Lewis** (Joseph Storey and Co. Ltd.); **H. Pike** (Hull and Liverpool Red Oxide Co. Ltd.); **J. Smethurst** (James Anderson and Co. (Colours) Ltd.); **V. Watson** (Cromford Colour Co. Ltd.); secretary **Allan J. Holden.**

A. K. Ames

● **Miss B. P. Park,** formerly with Optoshield Ltd., has been appointed sales manager of the eye protection department of Pyrene-Panorama Ltd., Windmill Road, Brentford, Middlesex. She has specialised for many years in industrial eye protection. It is intended to widen the company's range of eye protection, and Miss Park's appointment has been made in pursuance of this policy. She will continue to be available to give technical advice to users and to assist safety officers, and others, in educational work within the factory.



G. H. Owtram, managing director, Chas. Page and Co. Ltd., whose views on the merchant trade are given in 'Distillates', p. 806

● **Mr. R. V. Thomas** has been appointed as the new president of Goodyear International Corporation and a director of the parent Goodyear Tire and Rubber Co., U.S. Mr. Thomas, vice-president of G.I.C. since 1958, succeeds **Mr. F. T. Magennis** who has retired after 44 years with the Goodyear organisation.

● Elected as directors of Geigy (Holdings) Ltd., Manchester, as from 1 January 1962, and retaining their present appointments as shown, are: **Dr. F. Buchmeier,** deputy chairman and managing director, Ashburton Chemical Works Ltd., and deputy chairman, James Anderson and Co. (Colours) Ltd.; **Mr. H. Jones,** deputy chairman and joint managing director, The Geigy Co. Ltd., and director, Ashburton Chemical Works Ltd.; **Dr. H. B. Knuchel,** chief executive and secretary, Geigy (Holdings) Ltd., director, The Geigy Co. Ltd., and director, Geigy Pharmaceutical Company Limited; **Mr. J. A. Rodgers,** deputy chairman and managing director, Geigy Pharmaceutical Co. Ltd.

● **Mr. Robert S. Beausire** of Doulton and Co. Ltd., left London on 3 November for a six-weeks tour of Venezuela and Mexico. This is the first of a series of projected market investigations which he will be undertaking in Latin American countries on behalf of the Royal Doulton Group, whose manufacturing activities cover a wide range of ceramic products.

● **Mr. G. J. Hooper** has joined D.A. Stuart Oil Co. (G.B.) Ltd. as applications manager, and will be primarily concerned with the sale, to manufacturers and blenders, of cutting oil bases compounded at Wolverhampton by D. A. Stuart Oil Co. (G.B.) Ltd.—a wholly owned Amber subsidiary.

Commercial News

- Courtaulds' British Enka offer accepted
- No dividend from Cooper McDougall
- Hoechst shares for quotation in London
- New $126 m. loan for Olin Mathieson

Associated Fumigators

Whole of the issued share capital of Associated Fumigators Ltd., 112 Victoria Dock Road, London E.16, has been acquired by Rentokil Group Ltd., of Felcourt, East Grinstead, Sussex.

Associated Fumigators manufacture Tritox and Megatox systemic horticultural insecticides, 1080 rodenticide and methyl bromide, and carry out fumigation services in ships, mills and factories.

British Enka

Ordinary shareholders of British Enka Ltd. have accepted the offer of Courtaulds Ltd. to the extent of more than 90%. The offer has, therefore become unconditional. Courtaulds will in due course exercise their right to acquire compulsorily the balance of the stock. In the meantime, the offer remains open.

Cooper McDougall

Group net profit of Cooper McDougall and Robertson Ltd., a subsidiary of the Wellcome Foundation, for the year ended 31 August, totalled £90,184 (£239,942) after tax of £166,155 (£233,168). Directors are unable to recommend a dividend (10% in 1960).

Ammonia Casale

Ammonia Casale S.A., of Massagno, Switzerland, the company for the exploitation of the Casale patents in the production of synthetic ammonia and allied products, is to pay a dividend on its capital of 1.5 million Swiss francs of 20% (same) for the past financial year. A dividend of $6.50 (same) will be paid on the share units of the Panama company associated with Ammonia Casale, Panammonia S.A.

Celene

The Sicilian Government has authorised investment by Union Carbide Corporation of 970 million lire in Celene Co., Palermo, who operate petrochemical plants in Sicily. Celene are owned on a 50-50 basis with the Edison Group.

W. R. Grace

Third quarter 1961 earnings of W. R. Grace were worth 87 cents/share (73 cents), while the figure for nine months earnings was $2.59 ($2.16).

Atlantic Refining

Sales volume of Atlantic Refining Co. for the first nine months of 1961 totalled $416 million ($410 million). Earnings in the same period totalled $31.7 million, an increase of 16%. Chemical sales are running at an annual total of $30 million.

New chemical projects in hand are the construction of aromatics plants at Port Arthur, Tex., and at Smith Bluffs, Ark. (the latter with Pure Oil Co.); modernising a butylene alkylation unit at Philadelphia to raise capacity; and installation of modern wax-treatment and finishing equipment.

Atlantic Refining recently acquired J. P. Frank Chemical and Plastic Corporation, producers of p.v.c.

Guano-Werke

The Hamburg, West Germany, synthetic fertiliser producers Guano-Werke have sold DM 4.2 million worth of new shares to the German Wintershall AG concern at 500% face value. This means that Wasag-Chemie AG, Essen, lose their position as majority shareholder of the company; both they and Wintershall now have 37.5% of the new capital of DM 11,200,000.

Internationale Viscose

The board of NV Internationale Viscose Compagnie, of Breda, Holland, the holding company for shares of the Spanish artificial fibre producer La Seda de Barcelona, is to recommend for the financial year 1960/61 a dividend for 12%. This compares with 15% paid for the previous financial period.

Hoechst

It is hoped to start official dealings on the London Stock Exchange in the equity (£62 million) of Farbwerke Hoechst on Monday, 20 November. Since 1952, Hoechst's turnover has increased three and a half times to the 1960 level of DM 2,703 million. The rise in profits over the same period has been from DM 12 million to DM 107 million and the dividend has been raised in each successive year.

National Distillers

Third quarter 1961 earnings of National Distillers and Chemical Co. totalled 39 cents per share of common stock (40 cents). The nine months figure was $1.13/share ($1.39).

Olin

Olin Mathieson Chemical Corporation, U.S., have raised a loan of $126,270,000 dollars with the Prudential Insurance Co. The loan will run for 20 years and will have an interest rate of 3.5%. Olin raised a 100-year loan with Prudential on a previous occasion, covering the same amount and with 3.75% interest; it is understood that the new loan replaces this.

S.I.D.A.C.

1961 results of Soc. Industrielle de la Cellulose (S.I.D.A.C.) will cover the period 1 January to 30 June only because of the absorption as from 30 June of Union Chimique Belge, Fabelta and Cie Continental du Pegamoid. Net profit in this period was B.Fr.27.33 million (B.Fr.48.33 million for the whole of 1960). A net dividend of B.Fr.50 has been declared (B.Fr.100).

Thiokol Chemical

Nine months earnings of the Thiokol Chemical Corporation were worth 78 cents/share (57 cents).

Unilever

An interim dividend of 5.68d has been declared on ordinary by Unilever Ltd. and an interim of Fl.8 by Unilever N.V. (same). The U.K. company's interim shows a slight increase over 1960 due to a change in the rate of exchange between the £ and the guilder.

Union Chimique Belge

Net earnings of Union Chimique Belge for the year ended 30 June totalled B.Fr.83.04 million (B.Fr.65.18 million). A net dividend of B.Fr.65 (B.Fr.50) is proposed.

INCREASES OF CAPITAL

ASSOCIATED CHEMICAL COMPANIES LTD., Stockton-on-Tees. Increased by £385,000 beyond the registered capital of £3 million.

WELLCOME FOUNDATION LTD., chemical manufacturers, etc., 183-193 Euston Road, London N.W.1. Increased by £7 million beyond the registered capital of £3 million.

SCHERING AG, West Berlin. Shareholders are to be asked to raise capital by up to a maximum of DM 22 million by the issue of new shares at 150% face value. Share capital totalling some DM 84 million has 1961 dividend rights, this total having been of only DM 70 million last year.

NEW COMPANIES

LIQUID GOLD AND CHEMICALS LTD. Cap. £2,000. Manufacturers of liquid gold and other chemicals, etc. Permanent directors: Mohammad A. Rafee and Abdul H. Quraishi. Reg. office: 4 Blake Hall Crescent, Wanstead, London E.11.

VITAQUIFF LTD. Cap. £1,000. Manufacturers of dealers in chemicals, drugs, medicines, oils, disinfectants, toilet requisites and preparations, perfumes, etc. Directors: L. G. L. Unstead-Joss, H. M. Langley. Reg. office: 23 Essex Street, London W.C.2.

REMUS ASSOCIATES LTD. Cap. £1,000. Technical advisers, representatives, agents and designers of all kinds of chemical engineering plant, etc. Permanent directors: F. E. Wilkes, C. H. Coles.

MARSHALL'S PHARMACEUTICALS LTD. Cap. £5,000. Manufacturers of and dealers in pharmaceutical supplies, etc. Directors: M. Dweck and P. Marshall. Reg. office: 67 Moorgate, London E.C.2.

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CMF.87

Revised Standard for black and white disinfectant fluids

ADOPTION of new definitions for disinfectants of the coal-tar type has made it necessary to revise British Standard 2462, which deals with black and white disinfectant fluids. These new definitions are designed to avoid uncertainties arising from the inclusion in such fluids of active ingredients other than the coal-tar acids traditionally used.

Among other features of the new standard, the range of black and white fluids has been extended by the inclusion of new groups, and an additional method of testing germicidal value—the Phenol Coefficient (Staphylococcus)—has also been included. Copies of this Standard may be obtained from the British Standards Institution, Sales Branch, 2 Park Street, London W.1, price 5s each. (Postage will be charged extra to non-subscribers.)

Black bitumen coating

A new British Standard (B.S. 3416: 1961) provides for two types of black bitumen coating solutions. Type 1 specifies a brushing, spraying or dipping material for the protection generally of iron and steel, while type 2 deals with material for the brush or spray coating of drinking water tanks.

Particle size determination

First part of a new British Standard (B.S. 3406) which lays down methods for the determination of particle size of powders has been published. The standard is one of a series which will describe methods of determining the size distribution of particles in those fractions of powders which pass through a 200-mesh B.S. test sieve (76 microns). This first part deals with the sub-division of gross samples down to 0.2 ml.

Further parts of the standard being prepared are: Part 2, liquid sedimentation methods; Part 3, air or gas elutriation methods; Part 4, optical microscope method. Additional standards will be compiled as necessary.

Copies of Part 1 may be obtained from the British Standards Institution, Sales Branch, 2 Park Street, London W.1, price 6s each (postage extra to non-subscribers).

Deflection pH meters

A new British Standard (B.S. 3422) specifies requirements for deflection pH meters intended primarily for general laboratory use. It covers portable and battery operated instruments, and is complementary to B.S. 3145 'Laboratory potentiometric pH meters'. It deals with both single pH scale and multi pH scale types.

Copies of this standard may be obtained from the British Standards Institution, Sales Branch, 2 Park Street, London W.1 (postage will be charged extra to non-subscribers).

Colour makers consider interfirm comparison scheme

At their annual meeting, members of the British Colour Makers' Association heard a talk on the interfirm comparison scheme by a representative of the Centre for Interfirm Comparison Ltd. The council is now to consider the possibility of introducing such a scheme.

Market Reports

PRICE CUTS FOR NON-FERROUS COMPOUNDS

LONDON There has been no outstanding feature in the industrial chemicals market during the past week and prices for the most part are steady at recent levels. Export trade continues to make a satisfactory showing, with enquiries covering a wide range of products. The supply position is reported to be fairly easy.

Activity in the agricultural chemicals is reasonably good for the period, and the position of the coal tar products remains unchanged.

Further price reductions have been reported for non-ferrous metal compounds, dry white lead being 40s/ton lower, while red lead and litharge are both 45s/ton lower. These changes are effective from 14 November.

MANCHESTER With relatively few exceptions quotations on the Manchester chemical market have been steady to firm. A fair volume of fresh business has been placed by leading industrial consumers in the home section and moderate bookings on overseas account have been reported, while existing commitments are mostly being drawn against satisfactorily. There is a fair movement of bleaching materials, barium compounds, and industrial solvents, with a steady demand reported for most of the potassium, soda, and ammonium products, hydrogen peroxide, pure glycerine, and borax and boric acid.

SCOTLAND With prices continuing on a more or less firm basis, trading has been quite brisk particularly toward the latter end of the week. The usual varied range of industrial chemicals were involved and quantities in regard to both spot and contract were well maintained. Interest is also being shown in enquiries received relative to requirements for the coming year. The export market is still favourable, with a continuance of varied enquiries.

TRADE NOTES

Isophthalic acid price

Isophthalic acid 95 has been reduced in price, state R. W. Greeff and Co. Ltd., sole U.K. distributors for Amoco Chemicals Corporation, Chicago.

Draiswerke agents

K. W. Chemicals Ltd., Caroline House, 55/57 High Holborn, London W.C.1, have been appointed U.K. selling concessionaires for Draiswerke, G.m.b.H., Mannheim/Waldhof, for the sale of their machinery including specialised mixing and grinding equipment for the plastics, paint, printing ink, rubber, pharmaceutical and general chemical industries.

Changes of address

Polypenco Ltd. have moved from sales and administration departments to a new office suite at Gate House, Welwyn Garden City, Herts. Telephone number remains Welwyn Garden 25581-4.

From 18 November, the address of the British Sulphur Corporation will be 43 Great Marlborough Street, London W.1 (Gerrard 6628).

Weedkiller prices cut

Boots Pure Drug Co. Ltd. have cut prices of three selective weedkillers: Iso-Cornox (down 3s/gall.), Cornox R.K. (basic reduction of 10s/gall.) and Boots MCPA 25 (down 1s/gall.).

A.C.E. northern offices

Northern office of Automatic Control Engineering Ltd.—a wholly owned subsidiary of Constructors John Brown Ltd.—was officially opened at 15 Bloom Street, Manchester, on 8 November. Here, sales manager Mr. R. S. Seagrave will have a complete staff of draughtsmen and designers for the convenience of customers in the north of England.

The company offers services in the field of automation and process control to the chemical, oil, plastics and other industries.

Q. & Q. glassware in Ceylon

Hemas (Drugs) Ltd., of Bristol Street, Colombo, have been appointed by Quickfit and Quartz, manufacturers of interchangeable glassware, of Stone, Staffordshire, as distributors in Ceylon.

Bakelite laminated gears

Bakelite laminated material has for many years been used for non-metallic gears, the material being not only strong and stable but having also an elasticity sufficient to absorb shocks and intermittent stresses which, on occasions, would cause the failure of metal gears or gears constructed of other non-metallic substances. In addition, Bakelite laminated gears are resistant to most acids and mild alkalis and will operate satisfactorily in the presence of oil, water or steam.

These are among points made in an illustrated booklet from Bakelite Ltd., 12-18 Grosvenor Gardens, London S.W.1, which describes the physical and mechanical properties of the material, the applications to which it is suited, etc.

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Bookshelf

Third edition of Vogel's analysis gives added value

QUANTITATIVE INORGANIC ANALYSIS INCLUDING ELEMENTARY INSTRUMENTAL ANALYSIS. By *A. I. Vogel*. Longmans Green and Co. Ltd., London, 1961. Pp. xxx + 1216. 70s.

The text of the second edition has been revised and expanded making the present edition about 300 pages longer. Nine new chapters are included. Some of these are expanded versions of sections in the second edition. Thus, complexometric titrations were treated briefly in the second edition, while the present edition contains a 43-page chapter on the same subject; colorimetric and spectrophotometric analysis, nephelometric and turbidimetric analysis, and fluorimetric analysis are now dealt with in three separate chapters (a total of 115 pages) rather than in the single chapter (74 pages) of the second edition. New subject matter discussed include coulometric titrations, ion exchange and chromotographic methods of analysis, emission spectographic analysis, flame photometric analysis, solvent extraction method of analysis, and high frequency titrations. This represents a large increase in the discussion on instrumental analysis methods. In fact, slightly less than half the book is now taken up by instrumental methods of analysis. Some new 'classical' determinations are also described.

These additions make the third edition even more valuable than the second, and at 70s represents extremely good value. The book should have a strong appeal to teachers and students of all grades, as well as being an essential volume for the reference library.

Inorganic structure

STRUCTURAL PRINCIPLES IN INORGANIC COMPOUNDS. By *W. E. Addison*. Longmans, London, 1961. Pp. viii + 183.

All university courses on inorganic chemistry should nowadays contain a considerable group of lectures on the structural side of the subject. There has been no textbook suitable for use in conjunction with such a course although several advanced books have been written. The present book aims to meet this need. The author states that it is based on a course of first year lectures but the book is a much fuller treatment than this statement implies. The material is adequate for some honours courses.

The first two chapters are potted treatments of the 'Electronic theory of the atom and chemical bonding' and of 'Methods used for the determination of structure'. Forty-three pages are not enough in which to present the topics. More adequate introductions can be found in several general physical chemical texts.

The author comes to grips with his main theme in chapter 3 in which he describes several of the more important lattices with the aid of diagrams that are clear but not as good as the best in the literature. It is a difficult subject to treat vividly and the general effect is rather dull. The last five chapters which occupy 90 pages give a good account of factors that determine lattice structures, the covalent compounds and effects in the solid state. It is for these sections that the book will be principally read. The publishers are to be congratulated on bringing out this attractive book at a low price.

Enzymes

REPORT OF THE COMMISSION ON ENZYMES OF THE INTERNATIONAL UNION OF BIOCHEMISTRY. Pergamon Press, 1961. Pp. 159. 50s.

The title itself makes its clear that this book is essential to all who write about or teach enzymes, and in due course should be needed by those who read about them. Individuals may not agree with each and every recommendation, but this is the first attempt on an international basis to put order into enzyme nomenclature and should be supported. Criticisms arising out of the application of the recommendations will be the subject of debates by some future commission.

The book divides into two parts. The first, of 49 pages, is explanation of and reasons for the recommendations, and includes 14 general rules and between two and four extra rules for each of the six classes proposed (making 31 rules in all) which govern the choice of both systemmatic and trivial names for each enzyme. The second part consists of five appendices which cover the documents considered by the commission, recommended symbols for enzyme kinetics, a list of cytochromes, a key to numbering and classification of enzymes and, in 73 pages, a list of more than 700 enzymes giving the numbering, systemmatic and trivial names, the reaction and short comments. The index to the enzyme list gives the reference to the new numbering and the volume is completed by a four page index to the report. The printing is clear and the paper stout enough to stand much handling.

Ceramics

CERAMICS: PHYSICAL AND CHEMICAL FUNDAMENTALS. By *H. Salmang*, translated by *M. Francis*. Butterworths, London, 1961. Pp. x + 380. 70s.

This book is derived from the fourth German edition of this standard work. The translator has done much more than turn the text into English. In order to keep down the size and price of the third edition (which was never translated into English) the author omitted from the fourth edition those sections that required little revision. The translator who was Director of Research at the British Research Association reinstated this material and with the author's approval added some information from U.K. sources.

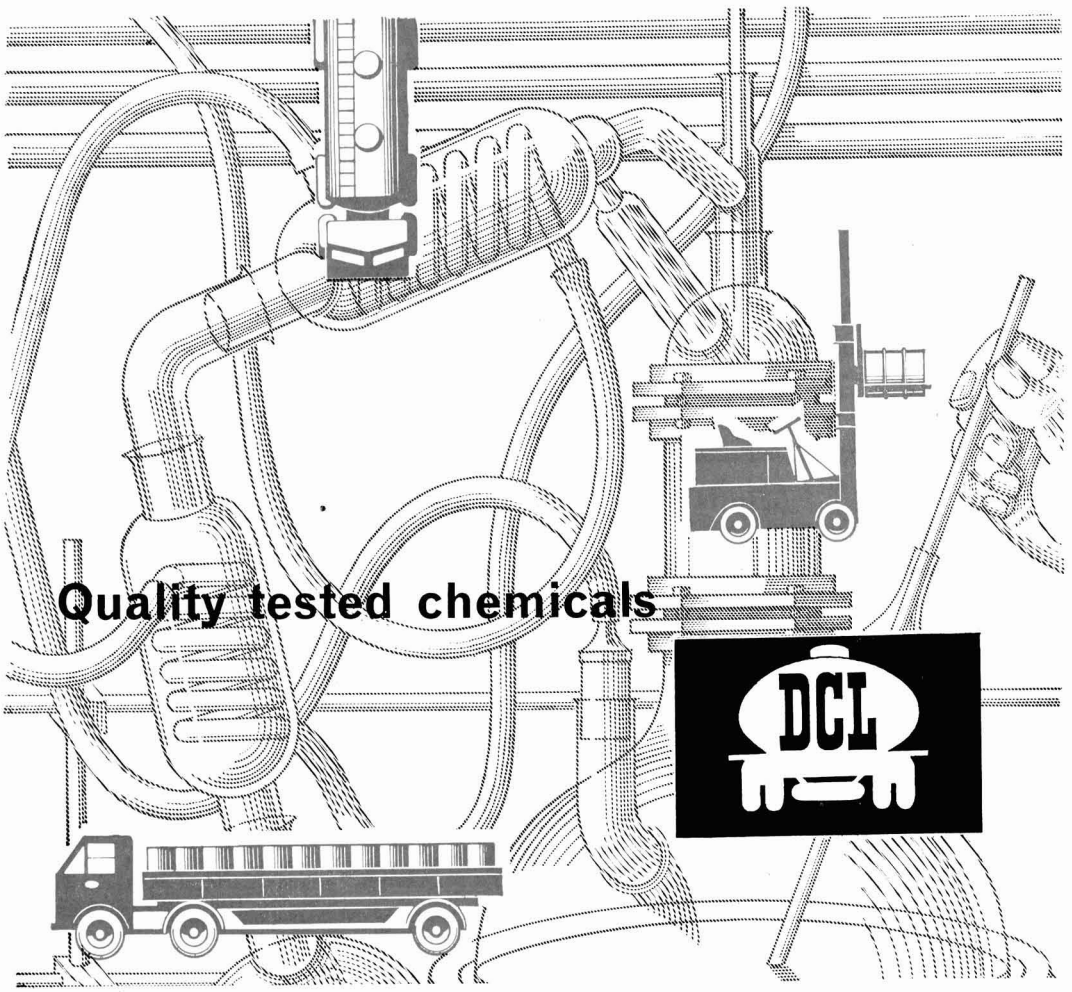
The book of 10 chapters falls roughly into two halves. The first deals with the properties of the raw materials of ceramics (135 pages is devoted to clays). The second half deals with ceramic products, with refractory materials getting 112 pages. Every chapter is fully documented with references, over 600 in one instance. It is clear that the book contains an immense amount of information authoritatively assembled, but one must also ask how far the author has justified his claim to present fundamentals. The answer is that ceramics is still an art but the author has brought science to bear wherever possible. The level of sophistication assumed of the reader is uneven. Sometimes detailed acquaintance with physical chemistry is called for but on another page the author explains in almost 'popular science' terms humidity and the drying properties of air.

Chromatographic reviews

CHROMATOGRAPHIC REVIEWS, VOLUME III. Edited by *M. Lederer*. D. Van Nostrand Co. Ltd., London, 1961. Pp. 187. 50s.

The first article in this volume of the series of reviews, which deals with multiple zones and spots in chromatography, is worthy of study by all who use chromatographic methods. There follow two articles which supplement a review in the previous volume on starch electrophoresis by the block technique, by discussing electrophoresis on starch columns and the use of starch gels. The subsequent article on continuous electrophoresis and two dimensional electrochromatography, is mainly concerned with apparatus but is illustrated by results on dyestuffs, proteins, amino-acids and peptides, sugars, alkaloids and inorganic ions. The fifth contribution on paper chromatographic separation and identification of phenol derivatives supplements a review in the first volume and presents 15 tables of valuable data. The following ing article on chromatography of lipids on silicic acid discusses the absorbent, the eluents, experimental considerations and order of elutions and then tersely covers a considerable number of lipids under several headings. The volume is completed by a progress report on inorganic paper chromatography, and a comprehensive bibliography of recent separations of inorganic ions by electromigration in paper, both of which have not appeared previously elsewhere.

The printing is clear, the illustrations are helpful and the paper is pleasant to handle. References are given after each review and, pleasantly, the bottom of every page gives the page number where references made on it can be found in greater detail. The production in slim volumes enables an individual to restrict his personal purchases more closely to his interests which may be essential when each such volume costs 50s.



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NEW PATENTS

By permission of the Controller, H.M. Stationery Office, the following extracts are reproduced from the 'Official Journal (Patents)', which is available from the Patent Office (Sales Branch), 25 Southampton Buildings, Chancery Lane, London W.C.2, price 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.

AMENDED SPECIFICATIONS

On Sale 13 December

Carbon black. Phillips Petroleum Co. **743 670**

Organo-metallic compounds. Union Carbide Corporation. **827 374**

ACCEPTANCES

Open to public inspection 20 December

Polymerisation of trans-substituted ethylenes. Stafford, W. H., Taylor, W. H., and Miller, W. **884 999**

Prevention of corrosion of metals in contact with oxygen-containing water. Ellis, S. R. M. **884 932**

Polyurethane compositions. Wyandotte Chemicals Corporation. **885 234**

Manufacture of silica. Standard Telephones & Cables Ltd. **885 118**

Amino-pyrazolone derivatives of aminocarbohydrates. Benckiser GmbH, Joh. A. **885 212**

Process for the endothermic catalytic treatment of gases containing hydrocarbons. Otto & Co., GmbH, C. **885 158**

Resin-drug compounds. Clinical Products Ltd. **885 087**

Stabilised acrylonitrile polymers and compositions thereof. Chemstrand Corporation. **885 200**

Production of silicon. Standard Telephones & Cables Ltd. **885 119**

Synthesis of ϵ-substituted caproic acids. Montecatini. **884 761**

Bis-phenol compounds and their preparation. F.M.C. Corporation. **885 005**

Thiophene-1,1-dioxide derivatives. **885 252**

Process for purifying high molecular weight olefin copolymers. Montecatini. **885 124**

Dioxazine pigments and process for their manufacture. Ciba Ltd. **884 821**

Process for the production of aldehydes and ketones. Consortium Für Elektrochemische Industrie GmbH. **884 962, 884 963**

Preparation of boron nitride. Union Carbide Corporation. **884 763**

Synthetic resins from amines and polyepoxides. Ciba Ltd. **885 215**

Synthetic resins derived from amines and polyepoxides. Ciba Ltd. **885 216**

Diphenyl ether derivatives and a process for their manufacture. Farbwerke Hoechst AG. **884 764**

Boron compounds and their preparation. Olin Mathieson Chemical Corporation. **885 063**

Production of sorbic acid. Distillers Co. Ltd. **885 217**

Process for the manufacture of halogenated 4-phenoxy-benzaldehydes. Farbwerke Hoechst AG. **884 765**

Thermoplastic resin mixtures and their production. Du Pont de Nemours & Co., E. I. **884 771**

2-alkoxy-4-amino-pyrimidines. Merck & Co., Inc. **884 772**

Manufacture of fluorine-containing aliphatic bromides and iodides. National Research Development Corporation. **885 007**

1:3:5-triazinylamino dyestuffs. Imperial Chemical Industries Ltd. **885 059**

Hydrazinium salts. Grace & Co., W. R. **884 775**

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Anhydrous anion-active detergent compositions in the form of aerosols. Soc. Monsavon-L'Oreal. **885 008**

Production of acrylic acid esters. Union Carbide Corporation. **885 037, 885 038, 885 039**

Bulk polymerisation of methacrylic esters. Soc. D'Electro-Chimie, D'Electrometallurgie et des Acieries Electriques D'Ugine. **885 091**

Process for producing cellulosic products. American Cyanamid Co. **884 805**

Mercapto compounds. Ciba Ltd. **884 847**

Production of D-arabitol by fermentation. Distillers Co. Ltd. **884 822**

Steroids and the manufacture thereof. Upjohn Co. **885 092**

Naphthalene azo dyestuffs and metal complexes thereof. Farbenfabriken Bayer AG. **885 042**

Stabilisation of chlorinated hydrocarbons. Imperial Chemical Industries Ltd. **884 823**

Disubstituted anilides and herbicidal compositions containing them. FMC Corporation. **885 043**

Method of producing alumina. General Motors Ltd. [Addition to 829 602.] **884 806**

Process for the production of carvomethene oxide. FMC Corporation. **885 044**

Method, apparatus and plant for separating components from a gas mixture by means of adsorbents in fixed bed. Rumania, Minister of Ministrul Industriei Petroluli Si Chimici. **884 798**

Pyrazolopyrimidines and process for the manufacture thereof. Ciba Ltd. **884 848, 884 849, 884 850, 884 851**

Cationic azo dyestuffs derived from imidazole and methods for their production and their use. Badische Anilin- & Soda-Fabrik AG. **885 046**

Production of synthesis gas. Texaco Development Corporation. **885 173**

Production of acrylic acid esters. Union Carbide Corporation. **885 048**

Organopolysiloxane compositions. Farbenfabriken Bayer AG. **884 807**

Production of 4:4-dimethyl-meta-dioxan. Institut Francais du Petrole Des Carburants et Lubrifiants. [Addition to 825 034.] **884 808**

Purification of liquors containing thiocyanate. Gas Council. **884 825**

Bibenzoate polyesters. American Viscose Corporation. **885 049**

Photopolymerisation of vinyl monomers. General Aniline & Film Corporation. **885 128**

Sulphonamides. Ciba Ltd. **884 827**

Process for the manufacture of isoprene from 4,4-dimethylmetadioxane. Institut Francais du Petrole des Carburants et Lubrifiants. **884 809**

Detergent compositions. General Mills Inc. **884 777**

Production of high temperature plasma streams. British Oxygen Co. Ltd. **884 970**

Process for improving the flame resistance of plastics materials. Farbenfabriken Bayer AG. **884 864**

Polyamide fibres of improved resistance to ultraviolet radiation. Ciba Ltd. **884 839**

Compositions comprising benzene hexachloride. Imperial Chemical Industries Ltd. **884 779**

Organo silicon isocyanates and isothiocyanates. Farbenfabriken Bayer AG. **885 011**

Polyurethanes. Farbenfabriken Bayer AG. **884 781**

Process for the production of polymeric material by dispersion or emulsion polymerisation. Dow Chemical Co. [Addition to 841 127.] **884 782**

Secondary aliphatic amines and method of preparation thereof. Rohm & Haas Co. [Addition to 839 865.] **884 783**

Process for the preparation of organometallic compounds. Ethyl Corporation. **884 784**

Alkylphenyl-halo triazines and processes for the manufacture. Ciba Ltd. **884 802**

3:4-dihydro-1:2:4-benzothiadiazine-1:1-dioxides and process for their manufacture. Ciba Ltd. **885 078**

Organic boron hydride derivatives. Metal & Thermit Corporation. **885 135**

Organosilicon resins. Midland Silicones Ltd. **884 845**

Dyestuff salts with quaternary ammonium compounds and their production. Grace & Co., W. R. **884 846**

Silicone elastomers. Midland Silicones Ltd. **884 879**

Process for the preparation of aqueous emulsions having anti-foam properties. Rhone-Poulenc. **884 972**

Block copolymers. Esso Research & Engineering Co. **884 974**

Process for the manufacture of 2-amino-anthraquinone. Ciba Ltd. **884 881**

Dyestuffs of the auramine series which have good solubility in alcohols and mixtures of alcohols and water. Badische Anilin- & Soda-Fabrik AG. **884 882**

Diamino-5,8-quinoline-quinone derivatives. Farbenfabriken Bayer AG. **884 883**

Diazapolymethine dyestuffs, their production and use. Badische Anilin- & Soda-Fabrik AG. **884 885**

Production of a well-adhering connection between a halogenated poly ethylene and other materials. Balzers Aktiengesellschaft Für Hochvakuumtechnik und Dünne Schichten of Balzers. **885 264**

Preparation of feed streams for hydrocarbon processing with aluminium bromide. Esso Research & Engineering Co. [Addition to 817 126.] **884 886**

Preparation of alkyl amines and chlorides. Continental Oil Co. **884 887**

Process for cracking dicyclopentadiene. Esso Research & Engineering Co. **884 901**

Stabilised polyolefin compositions. Hercules Powder Co. **884 888**

System for washing butyl rubber reactors. Esso Research & Engineering Co. **884 902**

Process for the polymerisation of butadiene. Shell Internationale Research Maatschappij N.V. **884 930**

Stabilisation of polyolefin materials. Montecatini. **885 113**

Science Minister to open O.C.C.A. exhibition

VISCOUNT HAILSHAM, Minister for Science, will be guest of honour at the fourteenth technical exhibition luncheon of the Oil and Colour Chemists' Association to be held on 26 February 1962.

The exhibition will be held at the Royal Horticultural Halls, and Lord Hailsham will open the exhibition by cutting a tape at the entrance to the Old Hall at 3 p.m. The exhibition will remain open until 7 p.m. on 26 February and will be open (from 10 a.m. to 7 p.m.) on the following three days.

Forms of application for lunch tickets will be enclosed in each copy of the official guide, which will be sent to all O.C.C.A. members. Non-members wish to obtain copies should write to the general secretary, R. H. Hamblin, at Wax Chandlers' Hall, Gresham Street, London E.C.2, before 31 December.

DIARY DATES

MONDAY 20 NOVEMBER

Inst. Metal Finishing—London: Northampton College of Technology, St. John St., E.C.1, 6.15 p.m. 'Detection & removal of hydrogen absorbed during chemical and electrochemical processing' by L. E. Probert & J. Rollinson.

S.C.I.—London: R.C.A., 6, John Adam St., W.C.2, 6.45 p.m. 'The structure which limit the penetrability of skin' by R. T. Tregear.

WEDNESDAY 22 NOVEMBER

S.C.I.—London: 14, Belgrave Sq., S.W.1, 6.15 p.m. 'Food technology in Norway' Film.

THURSDAY 23 NOVEMBER

F.S.—London: Lecture Hall of the Geological Soc., Burlington House, Piccadilly, W.1. 'On getting through to the farmer' by Kevin Fitzgerald.

S.C.I.—Belfast: Queen's University, Stranmillis Rd., 7.45 p.m. 'Some aspects of tannin chemistry' by Prof. R. D. Haworth.

S.C.I.—London: R.S.M., 1, Wimpole St., W.1, 2 p.m. 'Industrial cell culture and vaccine production' by Dr. C. Kaplan, Dr. P. B. Stones, Dr. A. Goffe, & Dr. F. T. Perkins.

FRIDAY 24 NOVEMBER

S.C.I.—Liverpool: Denbighshire Tech. Col., Wrexham, 7.30 p.m. 'Oxygen—gaseous & liquid—its production & growth' by J. B. Smith.

S.C.I.—London: 14, Belgrave Sq., S.W.1, 6.30 p.m. 'The production of organic compounds labelled with C-14 or Tritium' by Dr. J. R. Catch.

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The proprietor of British Patents Nos. 784398 and 802153, entitled "Polyisocyanate alkyd resin compositions" and "Resinous Products", offers same for license or otherwise to ensure practical working in Great Britain. Inquiries to Singer, Stern & Carlberg, 140 South Dearbon Street, Chicago 3, Illinois, U.S.A.

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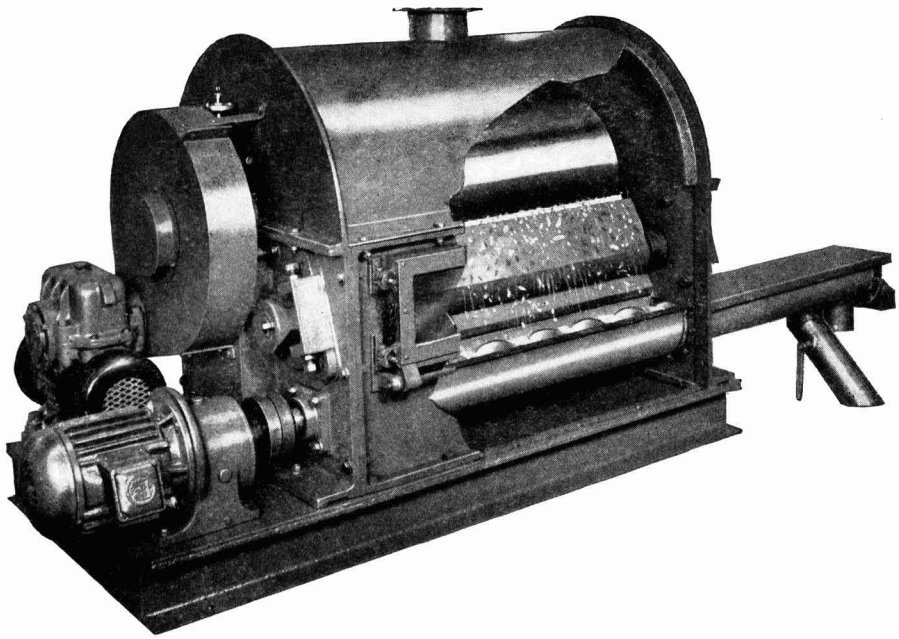

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