Chemical Age

incorporating

PETROCHEMICALS and POLYMERS

VOL. 86 No. 2198 26 AUGUST 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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To prolong their working life, automobile and aircraft tyres, along with most rubber goods, contain anti-oxidants. Acetone, one of the Shell **KETONES**, is an intermediate in their manufacture. The heavy organic chemical industry looks on the Shell range of **KETONES, ALCOHOLS, GLYCOL ETHERS AND AROMATIC HYDROCARBONS**, as raw materials as well as established solvents— **ALCOHOLS** are converted into lubricating oil dopes, **AROMATICS** end up as polymers for man-made fibres. On the other hand, when solvency is required on the 'heavy' scale the Shell range has the versatility to provide the answer too; Methyl Ethyl Ketone is used in the dewaxing of lubricating oils. As intermediates or solvents this comprehensive range of products may help you. Please write for further information.

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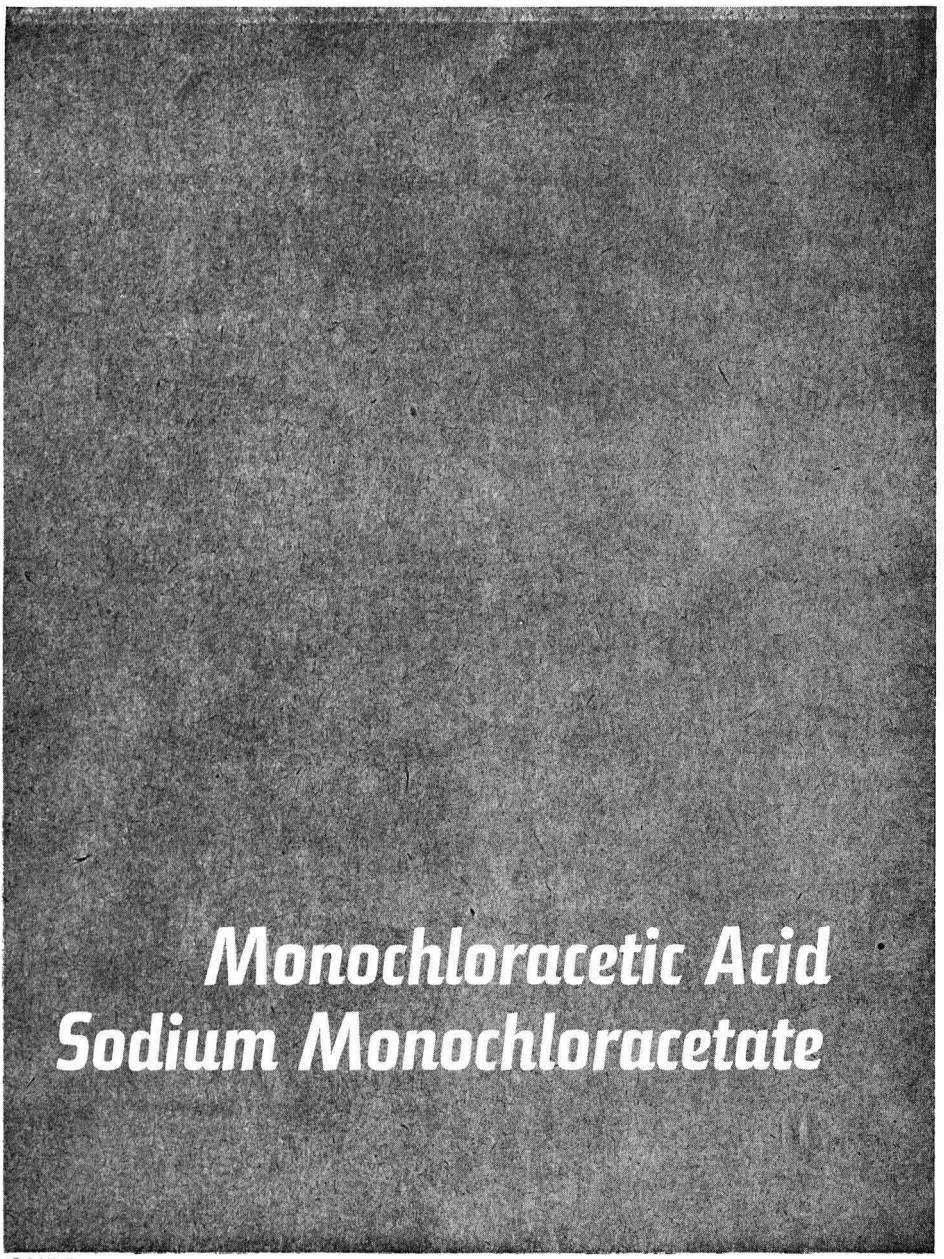

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IN THIS ISSUE

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incorporating
PETROCHEMICALS and POLYMERS

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BASIC SLAG

WHILE the exciting market potentialities of the newer compound fertilisers continue to dominate the fertiliser scene, a steady revolution seems to be taking place in the much more mundane world of basic slag. During the past year, usage of home-produced basic slag reached 740,000 tons—an increase of over 100,000 tons compared with the average for the three years 1957-59. The fact that this has taken place in a year when field conditions during the winter months were probably the worst in living memory is proof that the exceptionally high demand of the previous year was not due merely to the unsually dry conditions that prevailed during the summer of 1959 and continued to some extent throughout the winter. It is now obvious that there has been a considerable swing over to spring and summer application.

Demand for slag has for many years been greater than production and slag has been imported, according to demand, although imports do not represent a great proportion of deliveries. Thus, against the 740,000 tons used in the year July 1960-June 1961, only some 31,000 tons was imported during that period.

With the continuation of intensive grassland cultivation, usage of basic slag in another five years could rise to over 1¼ million tons/year. It has similarly been estimated that, with the changes taking place in the steel industry, production by that time may increase to 1 million tons a year. The increased production of basic slag is, in fact, an interesting side-effect of the intensive programme of technical innovation and expansion on which the British steel industry has embarked. Another noteworthy feature is that some of the newer steelmaking processes tend to produce basic slag of higher strength. In this category, for instance, are the techniques being adopted at the Redbourn works of Richard Thomas and Baldwins Ltd., where two Rotor furnaces—the first in the U.K.—will pre-refine the iron with oxygen (thereby reducing the work the open hearth furnaces have to do) and will incidentally lead to the production of high strength slag.

Quick to seize the opportunity that this affords were Scottish Agricultural Industries Ltd. who, as reported in CHEMICAL AGE last week (page 261) are soon to open their new £500,000 basic slag works at Scunthorpe, which will grind the new slag from Redbourn. The S.A.I. board has previously indicated that the availability of this slag will materially improve the company's competitive position in the basic slag market. It appears inevitable that, with new processes being introduced at other steel works, opportunities will arise for further enterprises in the production and marketing of higher quality slag, leading to greater competition.

Three reasons for the increases in basic slag usage have been suggested, as follows. In the first place, farmers are now more conscious of the value of basic slag for improving the quality of grassland. Every step towards intensification on the grass farm necessitates an increase in the usage of phosphate, as well as nitrogen and potash, in order to sustain high output and mineral-rich herbage. Secondly, more land is being laid down to grass, especially in the areas where livestock farming predominates. The

(*Continued on page 292*)

B.o.T. Report on Second Quarter Trade and Trends in Chemicals

IMPORT volume index for chemicals was 183 (1954 = 100) for the second quarter of 1961, compared with 208 for the first quarter and 167 for the second quarter of 1960, according to a survey of U.K. imports and exports published in the *Board of Trade Journal*, 18 August. The volume of chemical exports is indicated by the figure of 196 for the 1961 second quarter, against 204, 1961 first quarter, and 180, 1960 second quarter. Index numbers for chemical imports and exports over the whole of 1960 were, respectively, 170 and 181.

Imports of crude fertilisers and crude minerals, excluding fuels, are given indices as follows: second quarter 1961, 142; first quarter, 125; second quarter 1960, 126, this last figure being the same as the index for the whole of 1960.

Discussing the prices of manufactured products in July, it is noted that against the generally rising price trend, there was a slight fall in the average price level of chemical end-products. However, chemical and allied products, treated as a broad sector of industry show the same provisional price index for July, 142.6, as for June (May 143.0, April, 142.9). The report comments that "the average price level of chemical and allied products has fluctuated moderately over the past year as a result of disparate price movements shown by many of the wide range of manufactures in this group of industries." On balance, it is added, there is no evidence of a general trend in either direction.

One Form Instead of 23 Speeds Fisons' Export Business

A NEW method of documentation which cuts time in dealing with export orders has been adopted by Fisons Overseas Ltd., who handle the export business of the chemical companies in the Fison Group: Fisons Pest Control Ltd., Whiffen and Sons Ltd., Benger Laboratories Ltd., Genatosan Ltd., and Loughborough Glass Co. Ltd. More than 5,000 export orders a year are dealt with, covering some 200 different products for 90 countries, and it was found that expanding business was producing a serious hold-up in the order, invoice and shipping department, up to 23 different documents, sometimes requiring 30 copies of invoices, being required for orders.

Mr. G. J. A. Doole, manager of the department, therefore devised a new method of documentation and, since this was adopted, although overseas orders have increased by 50%, the number of staff has not been increased.

Mr. Doole undertook a detailed study to simplify the whole procedure. His intention was to devise one form to include all the necessary information and still be of manageable size. The form had to cover all the needs of export documentation of all the manufacturing companies within the Fison Group, and shipping and overseas Customs invoices. Orders covering over 100 items with part shipments also had to be catered for.

Such a form was designed and the procedure now utilises a master stencil pre-printed with a reproducing form 13 in. long, while the paper used for the works orders and export invoices measures only 10¼ in. long. Works order copies and other documents which carry information common to both order and export invoices are duplicated with the master mounted with the upper top as the lead edge. After duplicating the works order, the master is stored awaiting completion for the export invoice. The lower end of the master then becomes the lead edge for duplicating the export invoices. Reversing the master has permitted the deletion of works order information at the top of the master and the inclusion of combined certificate of value and origin in the lower part of the master.

The check on each customer's document requirements is made by referring to a customer's record card. This gives all the details about export and import licences, purchase tax, shipping particulars, agents' commissions and the distribution, routeing and number of documents required.

Uddeholm (U.K.) Form Chemical and Nuclear Plant Division

To extend their services in the chemical, nuclear and petroleum fields Uddeholm Ltd., British associates of Uddeholms A.B., Sweden, have inaugurated a Chemical and Nuclear Plant Division, which will be concerned with the design, fabrication and sales in stainless and clad steel of all types of tanks, pressure vessels, heat exchangers, fractionating columns, etc.

In Sweden the activities of Uddeholms A.B.—who operate extensive mines, steelworks, wood processing and other plants—include fabrication at their Degerfors works of pressure vessels for the chemical, oil, pulp and other industries; the current programme includes a thermal shield in stainless steel for Sweden's first nuclear reactor.

B.B.H. to Combine Two Chemical Producing Subsidiaries

BURT, Boulton and Haywood Ltd. announce that the business of their chemical manufacturing subsidiary, Alchemy Ltd., who have works at Belvedere, Kent, and the chemical manufacturing section of Burts and Harvey Ltd. at Bursledon, near Southampton, are to be amalgamated. It will be recalled that B.B.H. purchased from private interests the shares of Burts and Harvey Ltd., not previously owned, in March of this year.

The new organisation, which will use the name Burts and Harvey Ltd., will operate from 1 September 1961. (For directors, see 'People', p. 302.) B.B.H. emphasise that this change is purely organisational, and that the manufacturing and commercial operations of the two works will continue as at present.

Big New Potash Venture in Canada?

THE directors of Borax (Holdings) Ltd. announced that their U.S. operating company, U.S. Borax and Chemical Corp., have entered into a joint venture with Homestake Mining Co. of San Francisco, California, to complete studies relating to possible potash production in Saskatchewan, Canada, where U.S. Borax have been investigating permits held since 1957.

U.S. Borax, with mines at Carlsbad, New Mexico, is today the second largest producer of potash in the U.S. Homestake Mining have had extensive experience in gold and uranium mining.

If the completed studies indicate the technical and economic feasibility of a large Canadian potash operation, the two companies may participate equally in any company formed for such purpose. One or more additional associates may also be invited to participate in the future.

Basic Slag

(*Continued from page 291*)

traditional and the best means of giving the long ley a good start, and of ensuring a reserve of phosphate to keep the sward going, is a heavy dressing of basic slag at seeding time, supplemented with annual applications of suitable compound fertilisers. Third, basic slag, which is produced almost entirely within these shores, provides relatively quick-acting phosphate at very low cost and, in addition, has a liming effect equivalent to its own weight of ground limestone.

The practice of applying only in winter to established grassland was based on the belief that slag was slow-acting. Experience has shown that slag of high citric solubility can be very effective when applied during the summer months, when the going on the land is easier, and supplies are more readily available.

Project News

Catalytic Reformer Makes Progress at BP's Kent Refinery

GOOD progress is being made with the construction of new units at the Kent refinery, the **British Petroleum Co. Ltd.** reports. Work on a new catalytic reformer is going ahead and all the foundation work has now been completed. This plant will convert low-octane naphtha and benzine into high octane components for blending premium grade petrol. It is the third unit of this kind to be built at the Kent refinery and will be capable of processing 23,000 barrels of feedstock per day. The two existing catalytic reformers, commissioned in 1955 and 1958, already process 6,000 bbl./day and 10,000 bbl./day of feedstock, respectively. This new unit, the biggest catalytic reformer to be built in any BP refinery so far, is due to be ready for processing early in 1962.

Progress is also being made on the construction of the BP-California Ltd. aromatics petroleum chemicals plant at the Kent refinery. All the foundation work has been completed and at the beginning of September the first of five processing towers is due to arrive from the North of England. These towers vary in length from 66 ft. to 123 ft., and each will be transported in one piece from the manufacturers to Kent.

B.H.C. Place Contract for Baglan Bay Buildings

● FOR the new petrochemical project of **British Hydrocarbon Chemicals Ltd.** at Baglan Bay, Swansea, **Turriff Construction Corporation Ltd.** are to erect a building block, workshops, canteen, administration and works offices, chemical stores, fire station and other buildings. This will be carried out under a contract, estimated at £480,000, placed with Turriff by B.H.C., acting through the Engineering Division of the Distillers Co. Ltd. Work is to begin on 1 September. D.C.L. Engineering Division were responsible for the design of the buildings, in collaboration with their consultant architect, Mr. M. Pattrick, A.R.I.B.A.

Details of the Baglan Bay project were given in C.A., 15 April, p. 616, and 22 April, p. 651.

U.K. Consortium's Bid for Yugoslav Steelworks Contract

● PRELIMINARY agreement has been reached in negotiations by a U.K. consortium of engineering firms for a £28 million contract to build a new integrated steelworks in Yugoslavia. The consortium is the **Metallurgical Equipment Export Co.**, which includes Davy and United Engineering Co., Head Wrightson, Simon Carves, E.F.C.O., Joseph Parks and Wellman Smith Owen, and which, with other U.K. companies, participated in the contract for the big steelworks at Durgapur, India, as part of the consortium known as the Indian Steel Construction Co.

Barring any unforeseen hitch in the negotiations, final agreement on the Yugoslavian contract is expected to be reached during the next few months.

U.S. Range of Chemicals to be Made in U.K.

● NEW plant is to be built by **Pure Chemicals Ltd.**, Liverpool-based fine chemical manufacturers, following an agreement with the Weston Chemical Corporation of Newark, New Jersey, U.S., for the exclusive manufacturing and selling rights for all the latter's products. These include a range of additives for plastics, oils, etc., along with light stabilisers for polyurethane foams, chelators and flameproofing agents. The technical resources of both companies will be working together for the manufacture of new products and new applications of existing materials.

Pure Chemicals are not revealing, at the moment, the intended size and cost of the new plant, but say that design work has been completed and contractors are being negotiated. Plans are expected to be finalised in a few weeks time.

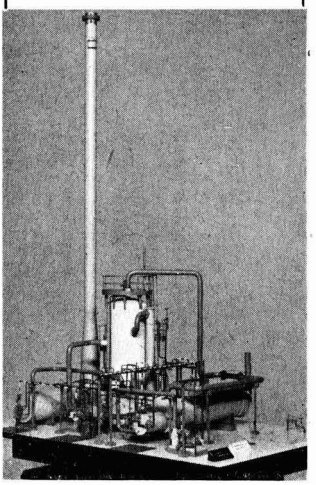
I.S.R. Contemplating Diene Rubber Project ?

● A PROJECT for the manufacture of Diene (polybutadiene) synthetic rubber in the U.K. may eventually result from the **International Synthetic Rubber Co.'s** appointment as sole U.K. agent for Diene rubber, the alkyl lithium catalysed polybutadiene produced in the U.S. by Firestone Synthetic Rubber and Latex Co. I.S.R.'s intention appears to be to establish a market for the product as a preliminary to manufacture in the U.K.

The product is expected to be used mainly as a partial replacement for natural rubber in tyres. Its high resilience and low temperature properties are stated to be superior to those of natural rubber or SBR. Abrasion resistance and improved resistance to cracking are further features claimed.

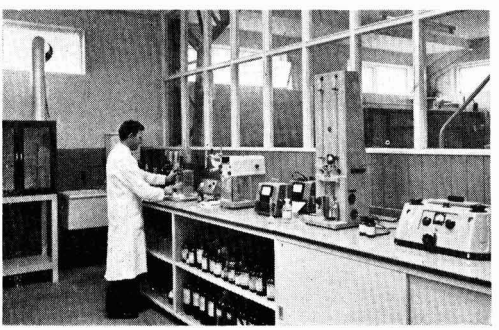
At their Hythe, Southampton, works, I.S.R. operate the U.K.'s first plant for the full-scale production of general-purpose SBR, with a capacity of about 100,000 tons/year, and last year (C.A., 10 September 1960, p. 383) started the production of high-solids SBR latex for foam applications.

SULPHUR RECOVERY UNIT FOR ARGENTINA

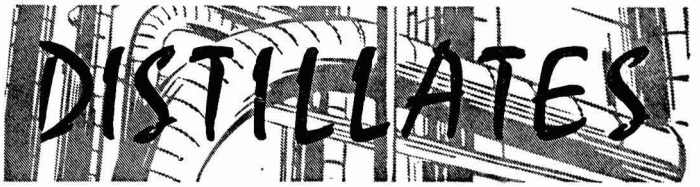


Model of a sulphur recovery unit under construction for Argentina by Parsons Powergas of London on behalf of the H. K. Ferguson Co. of Great Britain Ltd. The plant handles acid feed gas and will produce 42 long tons/day of sulphur with a minimum purity of 99.5% at a recovery efficiency of at least 95%

Modern Lab. for Warner's Dublin Factory



This small but unusually well-equipped laboratory is a feature of the new Warner - International drug factory at Blackrock, Dublin (see C.A., 15 July, p. 90)



★ Reminiscent rather of the more lurid forms of spy fiction than of the more sober world of chemical technology is the story that emerges from a suit filed in the U.S. Federal Court by Rohm and Haas Co., in connection with the polymeric materials inventions alleged to have been stolen from the company's files in the form of documents, which were later photostated and taken to Europe with the object of selling them to competitors of the company in France and Germany.

Defendant in the suit is Albert P. Sachs, of New York, while named as co-conspirators, but not defendants, are Milton W. Harper, of New York; Robert S. Aries, of Geneva, Switzerland, and formerly of Connecticut, who controlled firms competing with the plaintiff; Emil A. Aries and Arthur Pollak, both of Connecticut, and officers or former officers of Aries firms. It is alleged that Mr. Harper, a former Rohm and Haas employee, was induced by Mr. Robert S. Aries and Mr. Sachs to steal the documents, and that Mr. Sachs subsequently represented himself as the inventor, filing applications for patents in the U.S. and foreign countries. It is further alleged that, with Mr. Harper, Mr. Sachs went to Europe, taking the photostats, and that Mr. Harper posed as Dr. Williams, a technical expert in the employ of Robert S. Aries and Associates.

The suit seeks an injunction restraining the defendant and his alleged co-conspirators from using or disclosing any information obtained from the confidential files of the plaintiff, and damages.

★ The calibre of the work of Dr. Mikhail Klotchko, the Russian inorganic chemist who has been granted political asylum in Canada, is at the moment a matter of conjecture. Moscow so far has denied all knowledge of him and Embassy officials in Canada say, not unnaturally, that he is not an eminent scientist. He is however a Stalin prize-winner and a holder of a Red Banner Award, the next most important award to the Order of Lenin, and the Canadians have no doubt that they have attracted an important scientist.

Dr. Klotchko as a scientist has no criticism to make of Russian technical competence. His decision to leave was prompted by the refusal of the authorities to recognise some of his most important work. He wanted to be allowed to work as he wished.

At a press conference given by the Russian in Canada, he denied reports that he was involved in secret rocket research. He has never worked in a military field, only on pure research. He was awarded the Stalin Prize in 1948 for his work on metal refining.

Dr. Klotchko has been granted political asylum under a ministerial order which permits him to remain for a year while steps are taken to admit him into the country formally.

★ A procedure, which if successful will not only dispose of radioactive fission products but make them productive, is being studied in the U.S. The idea is to use the intense heat generated to convert sea water or other saline sources into drinking water. Work is being carried out on a pilot plant by a team from the Office of Saline Water in conjunction with the Atomic Energy Commission. It is intended to evaporate the active wastes and use the canned residue as heating elements in a distillation plant.

The disposal of radioactive wastes is a major headache and one which will increase rapidly. To date, the wastes have been concentrated and stored underground, but this necessitates constant and active supervision over a very long period. Another method, which has been under development at Harwell for some time (see Chemical Age 20 May 1961, p. 814), is to convert the waste into a glass-like substance enabling it to be stored with a minimum of supervision. The dissipation of heat produced, however, remains a problem and, even with this improved method, cooling is necessary.

The success of a method such as the one being developed in the U.S. would be warmly welcomed.

★ The amalgamation of the business of Alchemy and Burts and Harvey (see this issue, page 292) is virtually a marriage of cousins. The common parentage is through Burt, Boulton and Haywood Ltd., who have been associated with both companies since their inception. It was not until March of this year, however, that Burt, Boulton and Haywood acquired complete control of both organisations, thus enabling their combined resources to be welded into one company, which will take the name, Burts and Harvey Ltd.

It is planned that the new company shall form the nucleus of Burt, Boulton and Haywood's chemical development in the U.K., other than for projects to be carried out on the various tar distilleries with which the parent company is concerned.

Perhaps because of the former more-distant relationship, the products of the two companies have hitherto been distinct though complementary in that they have many customers and end-user industries in common. While this later development assists the co-ordination of the sales organisations, it is emphasised that the existing commercial relationships will in no way be altered.

Alchemy's works are situated at Belvedere, Kent, where its range of metallic soap and ester products, maleic anhydride and fumaric acid, etc., are manufactured.

The products produced at Belvedere will continue to carry the name, Alchemy, as a brand name.

The Spring Hill works of Burts and Harvey at Bursledon, near Southampton, originated in 1953, when a virgin site of some 13 acres was acquired. Subsequent activities have been directed to the production of a range of alkyl phenols, comprising octyl, nonyl, dodecyl phenol and octyl cresol, and the manufacture of coumarone/indene and similar hydrocarbon resins.

One of the advantages which will derive from this amalgamation is the complete integration of efforts hitherto limited to separate teams in the field of research and development.

★ Three leading U.S. drug firms have been indicted by a New York grand jury on charges of fixing artificially high prices and monopolising production of terramycin, aureomycin and tetracycline. They are Pfizer, American Cyanamid and Bristol-Myers. The charges were brought under the U.S. anti-trust laws.

The three antibiotics have doubled their sales in the U.S. in six years. In 1960, the sales amounted to $250 million and the three companies concerned earned about 70% of it.

Responsible for the indictment is Senator Kefauver, who, as chairman of the Senate's Anti-trust and Monopoly Sub-committee, collected evidence of profiteering and monopoly in the drug industry. It is on the basis of the hearings of the Sub-committee that the Anti-trust Division of the Department of Justice called a grand jury. The jury sat for 16 months before issuing the indictment.

The three firms have all protested their innocence very loudly. A conviction could carry a maximum penalty of $50,000 against each company and a $50,000 fine and a year in prison for the companies' presidents.

Alembic

Chemical Industry in Brazil

Great Development Opportunities, World-wide Firms Taking Interest

BRAZILIAN manufacture of chemicals can be ranked between the automobile industry and the lively textile industry. So far the chemical industry has kept up with the country's natural growth without exhibiting any great achievements.

The largest concerns in this industry have not yet reached the stage of wholly being able to take care of demands. For the time being a large part of the industry is striving to ensure self-sufficiency to their associated companies. It is therefore not to be wondered at that all local companies are not exclusively manufacturers of chemical products. There are however large initiatives under way in the chemical sector: it could be said that the strong competitive war being waged among the U.S. and European manufacturers on the international market is likewise already being felt on the Brazilian market.

World-wide chemical concerns are beginning to come to Brazil with a specialised programme in mind. New enterprises are being set up with the participation of Brazilian businessmen.

These new entities not only bring a breath of fresh competitive air with them on to the market, but they also contribute to reducing the transforming industries' production costs, who always relied upon foreign raw materials or semi-processed goods.

Lack of Official Interest

The government has not yet shown any interest in speeding up the development of the national chemical industry, and exchange advantages have not been availed of with the same impetus noted in other industrial sectors. The only exception has been in the case of the Companhia Nacional de Alcalis, the stockholding control of which is held by the Federal Government.

The federal authorities do not believe that the big names of the European and U.S. chemical industry are interested in setting up plants in Brazil. But if the question is examined a little more closely, the individual position of a few concerns in no way means a trend.

It might be said for the chemical industry that the phenomenon noted with regard to the pharmaceutical industry is repeating itself: some foreign manufacturers thought that the Brazilian industrial rush would be a short-lived one and that they could therefore carry on exporting their goods to this country. The producers already established there, however, went to show that the situation was otherwise, and when the "disbelievers" arrived on the field they were obliged to content themselves with a much lower position on the market, as well as having to face competitive fire from those who got there first.

The total amount of investments made through Instruction 113 (equipment imported without exchange coverage) for the period 1955-1960 comes to roughly 9.5% of the overall figure invested in all the country's industrial sectors. This is modest in view of the fact that the chemical industry is generally among those branches where investments are heaviest.

However, everything seems to point to the fact that this relative disinterest will change in the near future; in the last few months large investments by foreign concerns have been recorded and are likely to sharpen competition in several basic sectors of the chemical industry. The total absence of Japanese on the local chemical market is certainly worth noting.

Seen as a whole, one can say that Brazilian capital accounts for roughly 52% of the country's chemical potential. European interests take up another 29%, U.S. companies 19%.

The chemical industry in Brazil has the largest Latin American consumer market and offers reasonable export possibilities to neighbouring countries.

If the present encouragement were to be intensified, then we could undoubtedly witness considerable development in the chemical sector. The easy access to new sources of raw materials, the pronounced tendency of exchange protection with regard to locally produced commodities, plus the strong influence created by the self-financing policy in the chemical field are all essentially favourable factors.

Foreign investments in the chemical industry, through Instruction 113, amount to $41,856,561 since the setting up of this Instruction until October 1960.

The chemical industry received 8.7% of the total investments made. The total and percentage split-up of these investments is as follows:

Country	Amount ($)	% of Total
U.S.	12,175,109	29.06
Switzerland ...	7,069,819	16.89
Germany	6,413,741	15.32
Belgium	5,312,652	12.69
Canada	4,816,706	11.57
France	4,789,880	11.44
Venezuela ...	695,548	1.66
Sweden	234,057	0.55
Holland	120,166	0.28
England	118,883	0.28
Panama	110,000	0.26
	41,856,561	100.00

The following local companies received large investments: Union Carbide, Bayer, Copebras, Electrocloro, Ind. Quim. Rezende, Fongra, Rhodia, Petrocloro, Rhodiaceta, Nitrogenio, Electroquimica Fluminense, Alba.

The remaining investments are lower than $800,000.

Electrocloro and Petrocloro (they belong to the Solvay group) as a single firm are the largest investors from abroad.

Part of the Rhodiaceta's investment is for nylon thread. Separate investment figures are not available.

Investments in the chemical industry mainly cover production of lamp black, polythene, caustic soda, polyvinyl chloride, chlorine, wood alcohol, dyes, phenol.

Some foreign investing companies take part in several local industries, in the capacity of stockholders or suppliers of manufacturing licences:

American Marietta, Naegeli, American Marietta do Brazil.

Union Carbide, Union Carbide do Brazil, White Martins.

B.A.S.F., Idrongal, N. Hamers.

Rohm & Haas, Filibra, Quimica Sul-Brasileira.

CIBA, CIBA, Ind. Quimica Rezende.

Several local companies have several foreign companies in them: Fongra (Trans-American Chemicals and Hoechst), Resana (Wallace & Tierman and Nuodex Products), Nuodex (Etablissements fuer Industrielle Verfahren and Heyden Newport Chemicals), Industrias Quimicasre-Zende (CIBA, Geigy, Sandoz).

Round Up

General Chemicals (see table p. 296). Imports of pure carbon to Brazil in 1959 amounted to $1.81 million. The progressive production of this element, however, by the Brazilian firm, Copebras, who tripled their output from 1958 to 1960, indicates that the country will be almost self-sufficient in this field and there will be an eventual drop in pure carbon imports.

Non-processed crude sulphur imports, wholly from the U.S. totalled 11,000 tons in 1959 at a value of $2.3 million, while figures for pure sulphur precipitate, ground and purified are $100,000 for 400 tons for the same period.

Planned H_2SO_4 Expansions

Company	Capacity
SIMA	125 t.p.d.
Bayer	44,000 t.p.a.
Superfosfatos	81,000 t.p.a.

The planned expansions of caustic soda capacity (table p. 296) will considerably increase the country's ability to meet their own needs for this chemical, although a deficit of around 10,000 tons is still apparent, even when all the companies referred to are in full production. The current deficit is very much higher; an effective production estimated at 80,000 tons, excluding production by Alcalis who are still in the commissioning phase, but consumption is estimated

at 198,000 tons. Thus, despite the gradual increase in caustic soda production in Brazil, imports will still be called for over a number of years.

Insecticides. Benzene hexachloride, one of the three basic products manufactured in Brazil for the production of insecticides, is mainly produced by Electroquimica Fluminense and Matarazzo. Eletro Quimica da Hahia also produces BHC but to a lesser extent. Despite local production, imports of BHC still amounted to 578 tons in 1959. This figure, however, is considerably lower than those for the previous three years.

Production of DDT is carried out by one manufacturer—Fongra—who have an annual production of 2,000 tons. The fall of imports has also been apparent in this product due to an increase in local production. Imports have fallen from 3,600 tons in 1956 to 197 tons in 1959.

Aldehydes and Ketones. Chiris and Givaudan are the main producers of aldehydes. Alba and Medicinalis group are planning to start up a plant shortly for the production of paraformaldehyde. These companies are the sole producers of formaldehyde.

Acetone is produced by Rhoda, Victor Sence and Rasina.

Organic Acids and Anhydrides (see also table). The main producer of formic acid in Brazil is Qui Manil, who have a current annual output of 1,000 tons. Steady production increases of oxalic acid by Mantiqueira who plan to raise their capacity to 1,200 tons will probably enable the country to cover their total requirements.

Maleic and Phthalic Anhydride

Product	Capacity tons	Planned tons
Maleic anhydride	1,600	—
Phthalic anhydride	1,700	3,050

Dyestuffs. Nearly $7 million is the 1959 Brazilian import figure covering 1,505 tons of aniline dyes. This is 25.2% of the total chemicals and pharmaceuticals coming from abroad in that year.

This statistical position will become modified in Brazil's favour during the coming years, owing to considerable production increase of not only the traditional companies (Bayer, ENIA, Quimanil and Maegeli) but also new ones: Franco Brasileira de Anilinas and Industrias Químicas Rezende. Although this industry was truly started up during the first world war, it was only around 1953 that it really got going and attained its best period in 1960/61, with the defining of the position of the large industries in this field. Large scale dye production was begun by ENIA in São Paulo and by Aliança Comercial de Anilinas (Bayer) and Naegeli in Rio de Janeiro. The smaller type companies were not able to compete with the large ones in this sector. This is the case of Zambotto, whose set-up was acquired by CIBA.

Development registered in this industry has become possible due to the availability on the local market of raw materials produced from coal (National Iron and Steel) and of acids (sulphuric, hydrochloric and others) which can be obtained at internationally quoted prices. Prospects, too, are bright for alkali production, which in turn will enable production to go ahead on necessary intermediary products. The dye industry is currently as follows:

Company	Production
ENIA	Chiefly acid dyes for wool, direct cotton dyes, wool sock dyes, as well as Azoic dyes for solid cloth stamping. Produces over 120 types of dyes.
Bayer	Chiefly produces chromium and acid dyes for general woollens, direct cotton dyes and wool sock dyes.
Sandoz	Acid and direct dyes for wool, cotton and leather, for a large consumption.
Geigy	Acid and direct dyes covering a large consumption of wools, cottons and leathers.
Franco Brasileira de Anilinas	Solantren dyes and Solasol solid dyes for cotton and linen.
Industrias Quimicas Rezende	Acid and direct dyes for large consumption, for wool and cotton and leather. Azoic dyes.
Naegeli	Solid cotton dyes (Bydron type blues and Indocarbon type—black and sulphur black).
Idrongal	In 1960 started up Alizarin—dye production.
Quimanil	Azoic dyes for cotton, wool, etc.
Guarany	Mainly concerned with mixing and packing for domestic use.

Initial production of Industrias Químicas Rezende is estimated at 150-200 tons per year out of a 400-ton consumption figure, with Bayer and ENIA complementing local requirements. It can be said that import of acid and direct dyes will be dispensed with. Initial production capacity of Franco-Brasileira de Anilinas is 120-140 tons per year of Solantren dyes and from 80-90 tons yearly of Solasol dyes, for a consuming market assessed at 150-200 and 70 per year, respectively. Within a short space of time this company will be able to take care of the country's requirements as the plant is equipped for production increase. This company also plans to increase naphthazogene dyes, neutrogene dyes, and Solantren dyes production is just under way. Large-scale dye production, on the one hand, closing down imports of these products will call for imports of other raw materials and intermediate products, on the other hand, which are indispensable for the new industries, such as pyridine, anthraquinones, etc.

Furthermore, development in the field of dyes will require companies to start up their own raw material production by means of agreements with third parties, as occurs in several industrial sectors, in order to guarantee supply. Several special acids are already being turned out by ENIA and Bayer for their own requirements.

The importance of the consumer market—reckoned at 1,200 tons, fully justifies the fierce competition being felt in this sector.

Fertilisers. Despite the fact that phosphates for use as fertilisers have been mined for a very large number of years in Brazil, this activity has only recently begun to take on an industrial aspect.

Thus traditionally the supply of fertilisers to Brazilian agriculture was based on imports. However, in the years to come, large projects will be undertaken in this field thereby reducing the important role imports play in national agriculture. This change has already been felt with phosphate fertilisers and with nitrogenous fertilisers. As for potassiums, in spite of efforts at local production, it would seem that Brazil will continue, for quite a few years, to depend on foreign supplies.

Fertiliser consumption, which virtually began in 1950 (amounts were extremely low before this date) still keeps to very modest levels.

Year	Imports	Production	Consumption
1956	450,578	178,862	629,440
1957	548,172	219,651	767,823
1958	565,673	290,161	855,834
1959	424,521	466,097	890,618

From 1959 onwards, production was higher than imports in the overall Brazilian picture for fertilisers, which is explained by the starting up or expansion of some local factories.

The national fertiliser industry comprises mining, chemical transformation and blending. As was initially stated, the home production only covers phosphatic and nitrogenous fertilisers, whilst potassium fertilisers are wholly imported. Thought is being given, however, to the extraction of potassium salts from the salt plants, as this is a by-product of the salt industry. In this regard, Companhia Comércio e Navegação, who plan to avail themselves of existing potential in their salt mines in Rio Grande do Norte, might be mentioned.

There are 10 phosphatic fertiliser industries in Brazil: Serrana S/A, Cia. de Superfosfatos, Elekeiroz-Socal, Fosforita

(Continued on page 298)

Production of General Chemicals

Product	Company	Capacity '000 tons	Planned Capacity '000 tons
Chlorine	—	45	20
Sulphur	Brasileira de Enxfre	—	6
Phosphoric acid	Superfosfatos	—	12
Titanium dioxide	C.I.L.	1.2	—
Caustic soda	Alcalis	20	40 (possible)
	Igarassu	—	15
	Medicinalis	—	32
	Electrocloro	35	35
	Eletroquimica	14	15

URGENT—CHEAPER GAS PRODUCTION

Select Committee Pinpoints Weak Spots in Gas Industry Structure, Methods

GAS production costs must be reduced by about 30%—and quickly—if gas is to hold its position as a fuel. Any new processes brought in need to cost at least 4d/therm less than the average cost of making gas in a carbonisation plant.

The best chance of achieving a substantial reduction in costs appears to lie in large-scale production on a national basis backed by a national grid and helped by underground storage.

It seems desirable that the present structure of the nationalised gas industry, with its 12 area boards, should be modified by the introduction of a 13th board with special responsibilities for large-scale generation of gas and for its distribution to areas.

These are among the main conclusions of the Select Committee on Nationalised Industries following its investigation into the financing and operations of the gas industry. In its report (H.M.S.O., 6s 6d) the Committee comments at length on schemes that the industry has been examining for immediate development, and gives particular attention to the Lurgi gasification process and also to the idea of importing large quantities of methane. Among other matters discussed is research, on which the Committee believes that expenditure is too low in relation to the industry's turnover.

Structure of the Industry. Reviewing the present set-up of the industry, the Committee notes that the diversity of gas supply has been one of the chief characteristics of the industry, and comments that the differing availability of the different gases from place to place underlines the difference in the tasks which the 12 area boards have been facing. The problem of a national grid, and of gas production on a national or at least multi-area scale are being canvassed at present; the industry has reached a point of decision, at which old processes and the old structure are being called in question.

By-products from gas making processes (other than coke and breeze) earned £12.5 million in 1959-60, or about 4% of the gas industry's total revenue. Earnings have declined with the reduction of coal carbonisation, from £14.9 million in 1957-58 and £12.8 million in 1958-59. By-products that the gas industry has to dispose of are chiefly tar, benzole and ammonia, and the report notes that chemical works operated by the North Thames and South Eastern Gas Boards have enabled new markets to be opened up, for example, by a greatly increased extraction of naphthalene as a basic raw material for plastics. Both boards were satisfied with the profitability of their works and one of them claimed to be competitive in the price and quality of its products both with the other board and with two private firms who operate chemical works.

Scientific Staff. For scientists, engineers and chemists, the industry's situation is satisfactory, although there is a shortage of top grade people; the proportion of scientists and engineers in the total manpower rose between 1956 and 1959 from 1.2% to 1.6%. The gas industry was not employing in 1959 nearly as many chemists and chemical engineers as it had, in 1956, estimated that it would need by then, but this was a clear case of over-estimating.

Research. The Committee quotes figures to show the increasing importance that the Gas Council have attached to research—expenditure on research for the year 1960-61 is estimated at £1,325,000, and that for 1961-62, £1,483,000, against only £54,000 in 1949-50, £350,000 in 1955-56 and £708,000 in 1959-60. But, taking into account capital charges written off during the year, the figures indicate a slow start, a rapid increase up to 1957-58, then a three-year standstill, followed by big increases last year and this. The Committee feels that expenditure on research, even now, is too low in relation to the industry's annual turnover.

Hydrogenation

The report sets out the bare facts of the Partington hydrogenation experiment, which was suspended after an expenditure of £900,000; the Committee refrains from criticising or condoning the expenditure on the prototype plant, its timing, and the mistakes in the original estimate, commenting only that setbacks of this kind are implicit in any imaginative programme of research. It adds that in this case the prize—of a rich gas made from poor coal or from any grade of oil—could justify the large effort and expense on a scheme which may even yet succeed.

Also noted is the research on slagging gasifiers: on the Otto Rummel process, for which a pilot plant is now being established for the London Research Station at Bromley, there is at present no indication as to how near success this research is.

Storage and Transmission of Gas. After touching on the financial, technical and administrative considerations involved in the setting up of a national grid for gas distribution, the report notes that such a grid could not be built until "a really economic project" for making gas was found on which to build it. It was equally true that, in the present state of technical knowledge, this cheaper gas would not be forthcoming without its production in large-scale units and therefore a national system of supply. Two possibilities of providing this *raison d'être* are the production of gas from coal by large-scale Lurgi plants and the import of liquid methane, the Committee's observations on which are discussed briefly below.

The Gas Council hopes to be able to store underground some 10,000 million cu. ft. of gas using a geological structure (an 'aquifer') shaped like a dome of which the top and sides are of impervious rock or clay and the base is sealed by reservoir water. One site at Chilcomb, near Winchester, has been virtually proved satisfactory; of other possible sites one is in the North of England and three in the Midlands.

Saving Peak Load Costs

The Committee comments that large-scale Lurgi production would benefit from underground storage which would enable Lurgi gas to be fed to the area boards as they required it, thus adding savings of peak load costs within the areas to the benefits of a cheaper, mass produced gas. Underground storage would also be the ideal method for imported methane gas, which because of its high calorific value, gives twice the heat of an equal volume of town's gas.

Lurgi Process. This is a subject which the Committee discusses at some length and it recounts what it describes as the "dismal story" of the Lurgi project at Coleshill, Birmingham, which, although projected as a matter of urgency in 1951, suffered a number of setbacks over the years because sites proved unsuitable, impracticable from the point of view of effluent disposal, or unobtainable because of some local or Government objection. It was not until December 1958—some time after legal proceedings followed by a public enquiry—that permission was finally obtained to erect the plant at Coleshill. The plant will not begin operating until 1963. In addition, the estimated cost of production at Coleshill is now 11.25d/therm and, while it has other merits, this gas is now expected to be only marginally cheaper than gas made in some of the existing traditional plants of the West Midlands Area, although it would be perceptibly cheaper than in newly constructed plants with higher capital charges.

The Lurgi plant now in operation at Westfield, Fife, will make gas at 9.64d a therm, the Coleshill plant at 11.25d. Neither figure is within reach of the figure of 8d to 8½d specified by the Gas Council as the required cost of gas delivered to boards.

All authorities are agreed, however, that the Lurgi plant will operate most economically if it is on a larger scale. The study carried out at Desford, in the East Midlands area, showed that a net cost of 8.89d/therm could be achieved with large-scale production, but the pro-

posal for a plant on the Desford pattern was rejected by area boards. The Committee, in their report, criticise the Gas Council for its attitude towards large-scale production after the rejection of the Desford scheme, which seemed to "disappear from the scene" until the joint study began work this year.

The Committee welcomes the decision to look again at the possibilities of large-scale Lurgi plants as an urgent matter.

Imported Liquid Methane. The Committee discusses in detail the Gas Council's plans for importing methane, now awaiting Government approval and the conflicting points of view of the Gas Council and the National Coal Board on this topic. The Committee expresses a belief that it is commercially prudent for the gas industry to build up its supplies of feedstocks from a number of different sources.

Sweden Increases Range of Plastics Production, Boosts Exports

PRODUCTION of 66,000 tons of plastics materials in 1960 gave Sweden an increase of more than 100% over the 1955 production of 31,000 tons and more than 300% over the 1950 figure of 14,400 tons. Production of plastics *per capita* in 1959 was 7.4 kilos, on which basis Sweden took fifth place among the world's plastics producing countries.

Exports in the period 1950-1960 rose from 6,000 to 23,000 tons, but, since total consumption of plastics materials by the Swedish manufacturers of semi-manufactures and finished products in 1960 is estimated at some 89,000 tons, it is not surprising to find that imports have also increased tremendously: from 16,000 tons in 1955 to about 46,000 tons in 1960.

The rapid growth of the Swedish plastics industry is the more remarkable when one considers that Sweden lacks the two most important raw materials—coal and petroleum—for the production of plastics, and production is therefore very largely dependent on imported raw materials, especially methanol, phenol, acetone and naphthalene, though there is some home production of some of these materials. Other materials such as formaldehyde, phthalic anhydride, melamines, chloride, monomer, etc., are, on the other hand, manufactured on a scale sufficient to cover domestic demand, while formaline is produced to an extent which gives a considerable export surplus.

An ironical aspect of Sweden's plastics production is that while the most plentiful indigenous raw material is cellulose, the Swedish market has so far proved too small for economic production of cellulose plastics other than cellulose nitrates, water-soluble cellulose esters and viscose film.

All the most important types of thermosetting plastics have been produced in Sweden for many years, and in some cases fairly important exports are recorded. Phenolic plastics have been manufactured since 1917, other products now include ureas and melamines, unsaturated polyesters, alkyd resins and other special types of resins for the paint and varnish industry. Outside the thermosetting sector many other types of synthetic resins, especially for paint and varnish applications, are now manufactured, and a fairly new arrival is the manufacture of plastics-bonded mineral and glass wool from phenolic and cresol resins for the building industry.

Domestic production of thermoplastic materials did not start until after the war. P.v.c. production started in 1946 (Stockholms Superfosfat), polystyrene in 1950 (Svenska Polystyrenfabriken A.B. at Kävlinge) and acrylic plastics since 1947 (A.B.: Bofors Nobelkrut and its subsidiary, Bonoplastfabriken).

Swedish consumption of polythene has risen sharply since 1950 and now amounts to some 12,000 tons/year, the main suppliers being the U.K., the U.S. and West Germany. Polypropylene is not yet generally available on the Swedish market, but home production of this material is likely to come about when the big new petrochemical works now being built at Stenungsund start operating in a few years' time.

Brazilian Chemical Industry

(*Continued from page 296*)

Olinda, Profertil, Cia. Industrializadora de Minérios (CIM), Ipiranga, Camig, Bayer de Brasil (formerly Companhia de Ácidos).

Petrobrás is practically the sole local manufacturer (Cubtaõ Fertilising Plant) of nitrogenous fertilisers.

Cia. Siderúrgica Nacional supplies ammonium sulphate. The remaining firms mentioned are blenders of fertilisers.

Plastics and Resins. One fact beyond discussion is that after the extraordinary development which took place in the motor industry, the next sector to undergo considerable progress in the last few years was that covering manufacture of plastics materials and synthetic resins.

Imports of Plastics and Resins

Year	*Tons*	$1,000
1956	5,293	5,775
1957	7,115	5,911
1958	5,911	6,018
1959	3,997	3,978

The increase noted in Brazilian imports between the years 1956 and 1957 is to be explained, both from a value and volume viewpoint, by: (a) an increase in the number of manufacturers; and (b) there was concern to stockpile through fear of eventual insufficiency in local production. It can also be noted, however, that the tendency to reduce dependence on foreign supplies to low levels, or even to reduce this altogether, is visible. This fact arises from the production capacity increase in national industry. This position is apparent, too, in figures: imports in 1959 were two million dollars below the previous year's imports.

A brief analysis of this sector quickly shows the existence of large companies that specialise in this field and control a large part of the market. It is true that this picture is already showing signs of transformation by way of an increase in the number of manufacturers of the different products. Nevertheless, competition during the foreseeable future will not be so fierce. The size of the national market is extremely vast and there is a substantial consumption area which still remains virtually untapped.

Formaldehyde Products

In the urea formaldehyde field, Alba is the leading figure, though Aliberti, Resana and Sacra are also manufacturers. Alba also leads in the bakelite and phenol formaldehyde field, with a capacity for manufacturing 12,000 tons annually of these two types of resins.

Resana is to be noted as the principal manufacturer of melamine formaldehyde. This company's capacity (currently at 400 tons per year) is to be raised to 600 tons per year. It also holds a like position in the production of Alquidic Resins, for which it has a like-product registration.

The increase in Nylon production by Rhodiaceta and Rilsan is the cause of gradual import reductions. In 1958, 862 tons were imported but barely 278 tons in 1959.

The various types of polystyrene are produced by Bakol and Koppers. Each one of these companies has a production capacity of around 5,000 tons per year, to be raised to 6,000 tons. Idrongal is to be noted as having production projects for 1,000 tons of polystyrene annually, late 1961 or early 1962.

Union Carbide has an annual capacity of 4,500 tons of polythene and plans to raise capacity to 11,000 tons in 1961/62. There is a new competitor in the field—Petrocloro—and as from this year this outfit plans to manufacture every year 4,000 tons of polythene and 8,000 as from 1963. Copenal (connected with Bakol) too, has projects for manufacturing 3,600 tons of polythene, but this is subject to obtaining quota for raw material from Petrobrás.

In little more than 10 years, Eletrocloro has built up one of the most complex chemical industries in all Latin America, and this concern now plans to increase their p.v.c. to 24,000 tons per year (currently at 14,500 tons). Another producer of this chemical is Geon with a production figure of 5,000 tons per year, and this will be shortly doubled.

Rhodia is the only concern producing cellulose acetate (6,000 tons per year). Part of the Rhodia production is used in its own products, the other part being sold to its associate company.

Overseas News

U.S. AND FRENCH INTERESTS FORM NEW COMPANY TO MAKE ISOCYANATES

ISOCYANATES will be manufactured and sold by a new French company that is to be formed by Etablissements Kuhlmann, Paris, and E.I. Du Pont de Nemours and Co., Wilmington, Delaware. Kuhlmann and Du Pont will each own 50% of the stock of the new company, which will be called Dekachimie, and capitalisation will amount to NF.30 million. The new company is designed to serve markets in France and other Common Market countries for isocyanates, which are used in making both rigid and flexible urethane foams.

Dekachimie will build a plant near Lille at Kuhlmann's existing La Madeleine factory. Construction will be under way early next year and the plant will be completed in 1963. Meanwhile, isocyanates from the U.S. will continue to be sold in the European market by the new company.

Members on the Dekachimie board representing Etablissements Kuhlmann are: C. Jacquelin, deputy general director; Ph. Duval, secretary-general; J. Brocart, director of research and development; and M. Lagache who has been appointed *président-directeur général* of the new company. Board members representing Du Pont are: Milton H. Campbell, European director; Carl R. Faust, assistant European director; C. J. Harrington, assistant general manager of the Elastomer Chemicals Department; and Jean Villechaise, *président-directeur général* of Du Pont de Nemours (France) S.A.

Chloralkali Project in Brazil

The Diamond International Co., U.S., have plans to erect a plant near Cubatão in Brazil for the production of caustic soda and chlorine. Costing some $U.S.15 million, the project will be undertaken in collaboration with Brazilian interests and the Italian Ibis International concern.

With a capacity to produce 90 tons/day of chlorine and 100 tons/day of caustic, this will be South America's largest electrolytic chlorine/caustic plant. Hydrochloric acid will also be produced, to be used, among other things, for the production of dicalcium phosphate.

Japanese Firms Tie-up for Petrochemicals Venture

Japan Gas-Chemical have decided to establish a new company, Tokuyama Petrochemical after recent investigations into the possibility of constructing a petrochemical plant based on acetaldehyde and its derivatives and tying up with Idemitsu Kosan. The project is waiting the approval of MITI.

The entire capital of 6,500 million yen (£6.5 million) is to be invested by Japan Gas-Chemical. Both the president and vice-president of the new company will come from them.

The first stage of the programme is expected to be completed by October 1962. The company will manufacture approximately 60,000 tonnes of acetaldehyde a year by the Wacker process from the 40,000 of ethylene supplied by Idemitsu Kosan.

Illinois Sorbitol Plant Contract Placed

Baird Chemical Industries, New York, have awarded a contract for the design and construction of their Sorbitol plant to Badger Manufacturing Co., Cambridge, Mass. For this plant, which will have a capacity of 20 million lb. of Sorbitol, Baird's management has allocated $1 million. The plant will be constructed to allow for ready expansion to meet the growing demands of the Sorbitol market, especially in rigid polyurethane foams, pharmaceuticals, and cosmetics.

The 40-acre site in Peoria, Ill., allows ample room for Sorbitol expansion and for other chemical facilities which Baird is planning.

Oil Processing Plant Needed in Syria

It is reported from Rome that Oil-Chabich du Petrole S.A., who have obtained from the local government an authorisation to build a complete oil-processing refinery in Syria, are now looking for a firm which is in the position to supply a complete plant of this kind and to provide technical assistance to put it on stream.

Danish Refinery Opened

Denmark's first oil refinery, built at Kalundborg by Foster Wheeler, of the U.K., for the Tidewater Oil Co., was officially opened last week. The refinery is not yet completed and full production is not expected for some months.

Fertilisers in Colombia

Abonos Excelsior de Medellin have begun the production of granulated fertiliser at Cali, the first to be produced in Colombia.

Chemical Industry in Russia

According to figures published by the Soviet Embassy in London, industry as a whole in Russia fulfilled the programme for the first half of 1961 ahead of schedule. Among the industries mentioned as being responsible for reaching the target are mineral fertilisers, soda ash and caustic soda, synthetic fibres, and synthetic resins and plastics. Output in the chemical industry as a whole increased by 14% over the first half of 1960.

Increases in branches of the industry were 12% in fertilisers with a production of 7.6 million tons, sulphuric acid, 5% (2.8 million tons), synthetic fibres, 22% (121,000 tons), chemical equipment, 13% with a value of 118 million roubles (£47 million). Although the value of chemical equipment produced increased by the value of 14 million roubles during the first half of 1961 compared to the corresponding period of 1960, this industry did not reach the target for gross output.

Growth of capital investment in the chemical industry was 12%, and hourly labour productivity increased by 7%.

Israel to be Greatest Bromine Exporter

As from this autumn, when production will start at the extended Dead Sea Works, Israel will have a bromine production of annually some 10,000 tonnes and become the world's greatest exporter of bromine and bromine compounds. Expected production up to the end of next year has aready been sold in advance.

Czechoslovakia Plans Chemical Expansion Programme

Total Czech chemical production is to be increased by 97% over last year's figures by 1965, it is announced in Prague, particular stress being laid on production of synthetic fibres, plastics, synthetic fertilisers and synthetic rubber. Plastics production is to be brought up to 200,000 annual tonnes, or three times the 1960 figure, this representing a per-capita output of anything up to 15 kg per year. By the same target year per-head synthetic fibre output is to be brought up from the present level of 4.6 kg to one of 7.5 kg.

Japanese Chemical Output to be Trebled by 1970

Annual production of the Japanese chemical industry should reach a value of some 3,100,000 million yen by 1970, according to current estimates. The 1959 output of the industry reached a value of no more than 788,000 million yen and the present output is at a level of about 1,000,000 million yen. By April of this year the share of liquid raw materials in the total raw material supply to the industry had risen to 57%; as recently as 1953 this share was of only slightly more than 5%.

Synthetic Resins Company Established in Colombia

A new company, Química Borden, has been established in Colombia with a capital of 5 million pesos for the production of synthetic resins..

Diammonium Phosphate Plant for Eastern Canada

Cyanamid of Canada Ltd. will shortly start construction of Eastern Canada's first diammonium phosphate plant, to be

built, at a cost of more than $2 million in its first phase, on the site of the company's Welland plant near Niagara Falls, Ontario, where ammonia is already produced. The new plant will include facilities for the production of granular triple superphosphate. Completion of the first phase of this expansion programme is scheduled for mid-1962.

Cyanamid have hitherto imported triple superphosphate from the U.S. for sale in Canada.

New Starch Plant in Sweden

What is claimed to be Europe's most modern starch plant, is being built at Backaskog, South Sweden. The estimated cost of the project is Kr.2,200,000 (£150,000). The plant, which will go into operation in September, replaces 13 previous starch factories owned by the Swedish Starch Producers' Association.

Pharmaceutical Plant in Formosa

A new pharmaceutical production unit is being built near Taipeh, in Formosa, by Pfizer Pharmaceutical Co. (Taiwan) Ltd., a subsidiary of the Chas. Pfizer group. The works is due to open in May of next year.

Solvay Build Plastics Plant in France

The French company of the international Solvay group has started the erection at Tavaux, France, of a new plant for the production of Ixan, a copolymer based on vinylidene chloride. Production is to begin next year with an initial capacity of 5,000 tonnes/year, this later to increase to 10,000 tonnes. Obtainable in three types, the product is designed for the coating of paper, film and foils.

P.V.C. Powder Plant for Hungary

A plant for the production of polyvinyl chloride powder is at present being erected at Berente, in Hungary. With an annual capacity of 6,000 tonnes, the works will cost a total of some 500 million forints. With the production of the Berente unit, Hungary will become independent of imports of this material.

Israel Sells Fertilisers to Japan

The Israel Ministry of Development has sold $30 million worth of potash and phosphates to Japan to be delivered over a period of eight years.

Hydrocarbons Exhibition Cancelled

The 10th International Methane Exhibition and 6th International Hydrocarbons and New Sources of Energy Exhibition, which had been scheduled to be held at Piacenza, Italy, from 11-17 September, will not now take place, owing to a re-organisation of the organising body, Ente Manifestazioni Fieristiche Piacentine. This organisation, which will in future be known as the Ente Autonomo Mostre Piacentine, is to make a further announcement about the exhibition in due course.

Ammonium Perchlorate Project in U.S.

A $2 million expansion programme that will raise capacity for ammonium perchlorate from 2,700 to 6,100 tons/year is to be undertaken by Pacific Engineering and Production at their Henderson, Nevada, plant. The expansion, which should be completed early next year, includes a sodium chlorate unit, thus providing an on-the-spot source of raw material for ammonium perchlorate.

Courrières-Kuhlmann to Export Oxo-alcohols

The French chemical concern Courrières-Kuhlmann is to undertake a further extension of production units for oxo-alcohols. The effect of this will be to satisfy increased inland demand and permit exports.

Polish Phenol Plant for Yugoslavia

By the end of the current year Poland is to have delivered to Yugoslavia complete equipment for a 5,000-tonnes phenol plant. The delivery will be made by the Zekop trading organisation, of Warsaw.

Hong Kong Firm Restrained from Selling Cyanamid Drug

A pharmaceutical firm in Hong Kong has been permanently restrained from selling the drug sulphamethoxypyridazine, this drug having been developed by Cyanamid's Lederle Laboratories and sold under the trade name, Lederkyn. A consent decree, arising out of a complaint filed by American Cyanamid Co., enjoined T. W. Wu and Co. from selling the drug in violation of Cyanamid Hong Kong patent No. 11 of 1958.

The Hong Kong Supreme Court ordered that Wu be permanently restrained from infringing Cyanamid's patent and "in particular from importing, selling, offering for sale or dealing in any product not of the plaintiff's manufacture, which in pharmaceutical terminology, is within the generic description 'sulphamethoxypyridazine'". Wu and Co. were also ordered to delete all references to this word from their packaging, catalogues, price lists, containers, labels and advertising matter.

Oil Refinery for Teheran?

A proposal that a medium sized oil refinery should be built near Teheran has been put forward by Dr. A. Fallah, of the National Iranian Oil Co.'s technical development and research organisation. Aim is to solve the problem of maintaining supplies of petroleum products to Teheran and the north. A further suggestion is the laying of a second Trans-Iranian pipeline to connect Abadan with Teheran.

Canadian Firm to Receive Supplies of a 'New Phenol'

Dominion Anilines & Chemicals Ltd., Toronto, state that as a result of a licensing agreement between their parent firm, Koppers Co., Inc., and General Electric Company, they will be able to secure commercial quantities of a new phenol used in producing flexible plastics.

Abbott Colombia Plant Nears Completion

The new pharmaceutical plant of Abbott Laboratories, construction of which started in Colombia in January 1960, is expected to be completed next September. The cost of the plant is an estimated 25 million pesos.

Indian Fertiliser Plant Meets Difficulties

Caltex has informed the Indian Government that the company will be unable to supply naphtha for the proposed Vizagapattam fertiliser factory. The decision was reached in view of the Oil Ministry's announcement that imports of crude are to be restricted at the 1960 level

Du Pont Seek New Ways of Disposing of General Motors Shares

A NEW measure to be considered by the U.S. House of Representatives' Ways and Means Committee may reduce the tax burden on stockholders of E.I. du Pont de Nemours, still faced with the problem of disposing of 63 million shares in General Motors within 10 years by order of the U.S. Supreme Court (C.A., 27 May, p. 857). If the new measure is adopted, the distribution of shares would be treated as a return of capital instead of as ordinary income. Taxes due from shareholders would thus be reduced to about $350 million instead of about $1,000 million as at present.

Hopes are not high that the proposed measure will be approved, but Du Pont are looking for some relaxation of the present situation which will enable them to distribute the shares with minimum loss to the shareholders. In a recent letter to shareholders Mr. Crawford-Greenewalt, president, listed three alternative schemes that were under consideration, these being: (1) an offer to exchange G.M. shares for Du Pont stock, which would then be retired; (2) distribution of G.M. shares instead of cash as a part of Du Pont's dividends; and (3) sale by Du Pont of G.M. shares, with Du Pont paying a capital gains tax on the proceeds.

Du Pont are required to file a proposed judgment of divestiture with the U.S. District Court in Chicago by 5 September and, when the Court has entered its final judgment, divestiture must begin within 90 days and be completed within ten years.

Bookshelf

COMPETENT AND ELEGANT BOOK ON ELECTROCHEMISTRY

REFERENCE ELECTRODES. Edited by *D. J. G. Ives* and *G. J. Janz*. Academic Press, New York and London, 1961. Pp. xi + 651. $20.

With long-established subjects such as the present one there is always a need for a source-book by eminent authorities which records and distils the vast amount of experimental information and the many theoretical discussions which have been generated over the years. The senior authors of this monograph have accomplished their task in a most competent and elegant fashion. Following analyses of the mechanisms which give rise to potentials together with accounts and considerations of conventions, standard electrode potentials and experimental problems, there are eight chapters on the most important electrodes in common usage. These, to which contributions are made by G. J. Hills, R. G. Bates and F. R. Smith, are detailed accounts of the hydrogen, mercury-mercurous salts, silver-silver halides, glass, quinhydrone, oxide, sulphide, sulphate-reversible and membrane electrodes. Besides being thorough reviews of experiment and theory, each chapter contains a good deal of useful comment and descriptions of technique based on personal experience which is commonly available.

There are also three chapters about reference electrodes in non-aqueous solutions (G. J. Hills), microelectrodes and electrodes in biology (D. B. Cater and I. A. Silver) and electrodes in fused salt systems (R. W. Laity). These are fields in which there is much active interest at the present time and newcomers could find no better starting-point.

Although the price is too high to attract graduate students it is an essential purchase for their department libraries. Electrochemists, whether they be purely academic, biologists or industrial will find the book is a necessity.

Fluorine Chemistry

ADVANCES IN FLUORINE CHEMISTRY. VOLUME 2. Edited by *M. Stacey, J. C. Tatlow, A. G. Sharpe*. Butterworths, London, 1961. Pp. 220, 45s.

At first sight it might appear that the editors of this series should be congratulated on the prompt appearance of the second volume. Detailed inspection reveals, however, that the first article was prepared from literature available in 1959 and the second was presented as a paper at the Chemical Society symposium in July of that year.

C. R. Patrick reviews the therochemistry of fluorine compounds in the first article which makes the best of a rather uneven lot of results. He has several errors in his references. G. C. Finger on fluorine resources and utilisation presents a useful summary. J. R. Majer in an article on the mass spectrometry of fluorine compounds devotes most of his space to the discussion of cracking patterns. As yet these are not well understood. J. M. Tedder describes the fluorination of organic compounds with the element. The techniques for the production of significant quantities of material are well established if not completely understood. The discussion of the theoretical aspects therefore forms the most interesting and novel part of the article. The only inorganic article, by N. Hodge, reviews fully the fluorides of the actinide elements. This is likely to remain the most useful section of the book. Finally there is an interesting brief discussion of the physiological action of fluoride by B. C. Saunders. This is not an exhaustive review but contains 88 references which enable the reader to pursue the subject further.

Odour in Packaging

ODOUR IN PACKAGING. Institute of Packaging, London, 1961. Pp. 231. 25s.

This book contains a full record of the papers and discussion of the conference that was held in London in November 1960. The organisers had definite aims in mind which were stated in the first session. They may be briefly summarised: to make the printing and packaging industries fully aware of the problem; to ascertain these industries' future plans; to discuss methods used by suppliers and users for the prevention or dispersal of odours. The least valuable parts of the book are the photographs of those who presented papers etc., and a list of those who attended. Nevertheless these confirm the impression of the main text that the papers were authoritative and that the industries concerned were fully represented. That being so, one feels there can be few who really need their attention drawn to this workmanlike and valuable volume. On the other hand the importance of the unexpected is constantly re-emphasised in the discussion. Many people not directly concerned will find something of profit.

A healthy sign is that the first paper essentially describes the problems of the ultimate consumer who is often not sufficiently informed to play his proper part. Fortunately a member of the Marks and Spencer laboratories is able to state precisely what is acceptable to a first-class firm.

The Institute is to be congratulated on rapid publication at a low price.

Adhesive Joints

THE SCIENCE OF ADHESIVE JOINTS. By *J. J. Bikerman*. Academic Press, New York and London. 1961. Pp. viii + 259. $8.00.

What makes for adhesion and what are the practical aspects of the successful use of adhesives? Only within recent years has a systematic study of these questions been undertaken. Dr. Bikerman's monograph provides an exceptionally clear picture of the controlling features and of the methods by which they may be assessed. The material presented includes an account of solid surfaces: tack and setting in adhesives: the formation, strength and testing of adhesive joints: and a "summary for the practical man."

The book is a model of the scientific approach to a difficult topic and, with its selection of references to research accounts, it will be of the greatest value to all those engaged in the use or study of adhesives.

Organometallics

HANDBOOK OF ORGANOMETALLIC COMPOUNDS. By *H. C. Kaufman*. Van Nostrand, Princeton, 1961. Pp. iv + 1546. 169s.

Usually any large new reference book is a welcome addition to the literature of chemistry but it is difficult to find anything in the present work to commend. It appears to have been written to cash in on the present great interest in organometallic compounds without careful consideration of what was needed. The listing of 12,000 compounds occupies over 1,500 pages, that is eight compounds to the page, yet little more, and often less, information is given for individual compounds that can be found in the 'Handbook of Chemistry and Physics' which lists over 40 compounds to the page.

The purchaser pays heavily for the inconvenient non-tabular arrangement. Frequently the entries for compounds are incomplete, for instance more heats of formation have been reliably determined than are given. The references are very thin. One reason for the great size of the book is that the author has not kept to his title; 352 pages are devoted to phosphorus compounds which are never normally classed as organometallic.

Synthetic Rubber Output

Production of synthetic rubber during May was 152,500 long tons, compared with the revised April output of 150,000 long tons, according to the Secretariat of the International Rubber Study Group in a preliminary report, while 155,000 long tons were consumed, against the revised April figure of 145,000 long tons.

PEOPLE in the news

● The United Kingdom Atomic Energy Authority have agreed to release **Mr. P. T. Fletcher,** previously managing director of the Development and Engineering Group at Risley and, since April, special adviser to the member for reactors, to take up the appointment, as from 1 October, of director, responsible to the board of the United Power Co. Ltd., for construction and supply. The United Power Co. is a company recently formed to unite the nuclear engineering activities of Atomic Power Constructions Ltd. and the G.E.C. and Simon-Carves Atomic Energy Group.

● Following a recent illness, **Mr. D. R. Mackie,** at his own request, has resigned from his position as managing director of Monsanto Chemicals Ltd. with effect from 1 October. He continues as a member of the board. He will be succeeded as managing director by **Mr. John C. Garrels, Jnr.,** deputy managing director, who has been actively carrying out the duties of managing director since Mr. Mackie's illness in March. Mr. Garrels joined Monsanto Chemicals Ltd. from the Plastics Division of its American parent company at the beginning of 1961.

S. J. Reason

J. C. Garrels

● **Mr. S. J. Reason** is manager of the new Chemical and Nuclear Plant Division inaugurated by Uddeholm Ltd. (see page 292). Mr. Reason, until recently the senior technical representative with Nordac Ltd., chemical engineers, Uxbridge, has been in the chemical engineering industry ever since leaving the R.A.F. in 1946.

● **Sir Laurence Merriam, M.C.,** chairman of the British Xylonite Co., has been elected president of the Plastics Institute for the session 1961-62. He joined British Xylonite in 1919 and became the first managing director of B.X. Plastics in 1939. He spent the period 1940-45 with the Ministry of Supply and acted as special examiner of controls for the Board of Trade from 1948-50. He was knighted in 1949 and has been chairman of British Xylonite since 1959.

The following have been elected vice-presidents of the Plastics Institute for 1961-62: **Mr. P. C. Chaumeton, Sir John Dean, Messrs. P. A. Delafield, G. Dring, S. Ellice-Clark, G. W. Hodds, J. Lesser, W. F. Mitchell, A. E. Skan, Sir Miles Thomas, D.F.C., Messrs. W. C. Waghorne, G. J. Wevell.**

● **Mr. E. J. Robinson** has been appointed a director of the Head Wrightson Export Co. Ltd., which is responsible for the development of trade in overseas markets for the Head Wrightson companies. **Mr. R. F. N. Otway** has joined Head Wrightson Export as manager—Europe. Before taking up this appointment he was with the Morgan Crucible Co. Ltd.

● **Mr. A. Nicholson,** chief chemist of the Pyrene Co. Ltd., has been appointed a divisional director (chemistry). He joined the company in 1939 and was appointed chief chemist in 1943. In his new post he will be responsible for the direction of the company's chemical activities. Mr. Nicholson, who is in charge of all the Pyrene laboratories, has for many years made a close study of the development of fire extinguishing media and metal treatment processes.

● Directors of the new Burts and Harvey Ltd. organisation formed by Burt, Boulton and Heywood Ltd. (see 'Commercial News', p. 292) will be: **Lt.-Col. J. H. Hulbert** (chairman), and **Messrs. A. J. Hayward, C. D. Knapton, N. M. Mischler, A. Rosenfeld, D. H. Spranklin** and **W. A. White.**

● **Dr. Leo Marlon,** senior director of Canada's National Research Council, Ottawa, has been elected president of the Chemical Institute of Canada. **Dr. Laurence H. Cragg,** vice-president of the University of Alberta, was elected vice-president.

Obituaries

Dr. William Angus Macfarlane, C.B.E., managing director of the National Industrial Fuel Efficiency Service and president of the Institute of Fuel, died last week at the age of 53.

A chemist of some distinction, his career included a period of research at the University of California, where he obtained a Ph.D., and in 1934 he was appointed a junior scientific officer at the Fuel Research Station, Greenwich. In 1938 he became senior research chemist to the L.M.S. Railway and on the formation of the Ministry of Fuel and Power in 1941 he was appointed Director of Fuel Efficiency. In 1948 he went to the U.S. as director of the U.K. Scientific Mission and Attaché for Scientific Questions at the British Embassy in Washington.

He became president of the Institute of Fuel in October 1960.

Dr. Rudolf Speich, vice-president of the Swiss chemical company Ciba AG, of Basle, has died in Basle at the age of 70.

Mr. Clarence Walker Beck, a director of Laporte Acids Ltd., and manager of that company's Hunt Works, Castleford, died recently at the age of 64. He was due to retire next year.

He joined Hunt Brothers (Castleford) Ltd., in 1924, and became a director of the company and also of John Nicholson and Sons Ltd., of Hunslet. He remained a director when those companies amalgamated under the name Laporte Acids Ltd.

Mr. Beck obtained his M.Sc. degree at Leeds University and was an Associate of the Royal Institute of Chemistry.

B.T.C. Again Draws on Chemical Industry

● Two more members of the chemical or allied industries are to join the British Transport Commission under the chairmanship of Dr. Richard Beeching, a director of I.C.I. They are **Mr. L. H. Williams,** former managing director of

L. H. Williams

Shell Chemical Co., and **Mr. P. H. Shirley,** chairman of Batchelors Foods, a subsidiary of Unilever.

Mr. Williams, who will be responsible for the B.T.C.'s commercial affairs, took up an appointment with Shell Petroleum when he graduated from Cambridge. He joined Shell Chemical in 1945 and became managing director 10 years later in 1955. Last year he transferred to Shell International and retired from there in June of this year at the age of 52. It is understood that the possibility of his joining the British Transport Commission was discussed while he was still with Shell. Mr. Williams will receive a salary of £7,500, the amount normally paid to full time Commission members. As a 'pensioner' of Shell he has been appointed to the board at the customary salary.

Mr. Shirley, who is 48 and Australian born, will have the special responsibility of finance and will receive a salary of £12,000 which is "that necessary to place him in the same financial position as under his present employment."

Commercial News

- B.B.H. Confident in Profits Forecast
- Borax Holdings Trading Profits Down
- Du Pont of Canada's Higher Sales
- Hüls Anticipate Reduced Turnover

B.B.H.

The chairman of Burt, Boulton and Haywood Ltd. reports to shareholders that he is satisfied that the forecast, given at the time of the unsuccessful take-over bid by the Horlicks concern, of profits before tax applicable to the Ordinary of not less than £500,000 for the current year, was properly prepared and gave as accurate a view of the existing situation as possible. Group profit for the year to 31 March 1961, as reported in CHEMICAL AGE last week, was better than forecast.

B.B.H.'s decision to amalgamate Alchemy Ltd. and the chemical manufacturing section of Burts and Harvey Ltd. is reported on page 292.

Borax Holdings

Trading profits of Borax Holdings for the nine months ended 30 June, after charging depreciation of £1,687,860 (£1,629,147), fell by £202,202 to £2,977,061. After taxation, net profit of the group was £1,943,426 (£2,164,823).

Allied Colloids

Profit shown by Allied Colloids for the year ended 31 March 1961 was £147,334, £71,000 after tax. This compares with £138,905 before tax for the previous year. Dividend for 1960-61 is 17½%.

Allied Colloids distribute dyestuffs, auxilliary chemicals and specialised chemical products for Badische Anilin- und Soda-Fabrik A.G.

Baird Chemical

Baird Chemical Industries, New York, plan to acquire Barlow Chemical Corporation. Directors of both companies have approved the transaction and the acquisition will be made on a cash basis pending stockholder approval.

Barlow, 10-year-old manufacturers of Barquat quarternary ammonium compounds and Barlene tertiary amines, operate production and research facilities in Ossining, New York.

B.A.-Shawinigan

British American Oil's recent acquisition of a 25% interest in Shawinigan Chemicals of Canada involved a cash payment of $12,078,000, and transfer to Shawinigan of B.A.'s half-interest in the B.A.-Shawinigan Company.

C.I.L.

Consolidated sales of Canadian Industries Ltd. and its subsidiary companies for the first six months of 1961 amounted to $88.3 million, a decline of 3% compared with the corresponding period of 1960, Mr. Peter C. Allen, president, announced in an interim report. Consolidated net income for the period at $3,487,000 was equivalent to 39 cents/share of common compared with $4,492,000, or 51 cents/share in the corresponding 1960 period.

Linde's Eismaschine

Gesellschaft für Linde's Eismaschine AG, Wiesbaden, one of West Germany's main producers of chemical plant, have withdrawn founder shares worth DM 130,000 without repayment. Remaining founder shares have been converted to bearer shares and the reduced capital of DM 51,270,000 has been increased by the issue at 300% face value of one new share per four old shares.

Dow Chemical

Dow Chemical report a quarterly dividend per share of 40 (35) cents for the second 1961 three-month period. No stock dividend will, however, be granted in autumn; in previous years a dividend of 2% in shares has been paid.

Du Pont, Canada

Net sales of Du Pont of Canada Ltd. for the first half of 1961, at $53.6 million, were 8% higher than the $49.8 million for the corresponding period of last year, due mainly to increased business during the second quarter. Net income for the period was $3,996,000 ($3,680,000) and earnings on common 54 (50) cents/share.

Substantial costs continued to be experienced in the initial operating phases of the polythene resins plant near Sarnia, Ont.

Hoechst

The West German chemical company Farbwerke Hoechst have issued a prospectus for the sale of DM 7 million worth of new shares. The issue is to facilitate the introduction of the company's shares on foreign Stock Exchanges, and increases the issued capital to DM 700 million.

Dividend for 1961 is expected to be "satisfactory".

Noury en Van der Lande

The Deventer, Holland, chemical producers Koninkiljke Industrieele Maatschappij vh Noury en Van der Lande NV announce for 1960 a net profit on trading of Fl.2,528,000 as against one of only Fl.1,185,000 in 1959. Company reserves rose over the same year from Fl.14,481,000 to Fl.16,382,000.

Reichhold Chemicals

Over the first half of the current year Reichhold Chemicals Inc, U.S., recorded a net profit of $290,000, or 7 cents/share, as against one for the corresponding 1960 period of $1,720,000 (45 cents/share). Sales were of, respectively, $51,470,000 and $51,840,000.

Hüls

A loss in current export business of DM 20 million is expected by Chemische Werke Hüls A.G., West Germany. Most of the loss would be due to the revaluation of the mark last March. Since the loss could hardly be made up by greater sales in the home market, a repeat of last year's turnover of DM 709 million is unlikely to be achieved in 1961.

HIAG

The HIAG-Werke AG chemical concern, of Austria, announce a 7% dividend for 1960 after a turnover increase of 41.5% net over the previous financial year.

INCREASES OF CAPITAL

PRIORY LABORATORIES LTD., Pyramid Works, Old Farm Road, West Drayton, Middx. Increased by £4,900 beyond the registered capital of £100.

HENRY W. PEABODY (INDUSTRIAL) LTD., manufacturers of detergents, etc. Increased by £25,000, beyond the registered capital of £75,000.

FRIEDRICH UHDE GMBH, chemical plant manufacturers of Dortmund, West Germany, have raised their capital from DM5 million to DM7 million.

NEW COMPANIES

INDEPENDENT ADHESIVES AND CHEMICALS LTD. Cap. £10,000. Manufacturers of and dealers in chemical products, glue, thinners, and other adhesives, etc. Sec.: Helen Nicholson. Reg. office: 13 Mansfield Street, London W.1.

FERNSTRAW PRODUCTS LTD. Cap. £500. Manufacturers of and dealers in chemicals, dyestuffs, etc. Directors: S. H. Newman, J. A. Burgess, E. O. Hampton. Reg. office: 34 Nicholas Lane, London E.C.4.

R. H. FLEMING LTD. Cap. £1,000. Manufacturers of and dealers in chemicals, gases, drugs, medicines, etc. Directors: R. H. Fleming and Mrs. Marion Z. Fleming. Reg. office: 1 North Street, Storrington, Sussex.

A. D. WOOD (LONDON) LTD. Cap. £10,000. Manufacturers of and dealers in scientific glassware and laboratory equipment, etc. Director: A. D. Wood. Reg. office: 4/5 Skinner Street, London E.C.1.

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 20 September

Vinyltoluene-unsaturated ester interpolymers. Dow Chemical Co. **731 111**
Steroid compounds. Merck & Co. **823 940**

ACCEPTANCES

Open to public inspection 27 September

Polymerisation of unsaturated aliphatic compounds. Dunlop Rubber Co. Ltd. **878 146**
Spasmolytic basic esters. Lepetit S.p.A. **878 274**
Modification of polymers. Burke, O. W. **878 150**
Process for the production of citric acid by fermentation. Kyowo Hakko Kogyo Kabushiki Kaisha. **878 151**
Process for the production of itaconic acid by fermentation. Kyowo Hakko Kogyo Kabushiki Kaisa. **878 152**
Benztriozle derivatives non-acetinic agents and their use. Geigy AG, J. R. **878 362**
Selenides of copper, zinc and cadmium. Merck & Co. Inc. **878 096**
Methods of treating minerals containing alumina and silica. Pechiney. **878 082**
Vinyl polymer textile yarns and filaments and a process for their production. Union Carbide Corp. **878 217**
Hydrogenation. British Petroleum Co. Ltd., Haresnape, J. N., and Yeo, A. A. **878 459**
Purification of polyethers. Imperial Chemical Industries Ltd. **878 460**
Quinoline derivatives and the manufacture thereof. Wellcome Foundation Ltd. **878 461**
Process for selective extraction of nitrates from aqueous nitrate-sulphate solutions. Rohm & Haas Co. **878 244**
Process for the manufacture of polyethylene terephthalate of high molecular weight. Farbwerke Moechst AG. **878 125**
Method and apparatus for the filtration of undigested sewage sludge. Komline-Sanderson Engineering Corp. **878 099**
Monoazo dyestuffs derived from diphenyl ether and their use. Geigy AG, J. R. **878 129**
Vinylic aluminium compounds. Metal & Thermit Corp. [Addition to 777 158.] **878 130**
Organic polymeric phosphonitrilic derivatives. Napier & Son Ltd., D. **878 324**
Process for the manufacture of titanium disulphide. Laporte Titanium Ltd. **878 101**
Fluorinated cyclohexadiens National Research Development Corp. **878 131**
Method of and compositions for reducing foaming of aqueous liquids when boiled. Geigy Co. Ltd. **878 168**
Amine-epoxide compositions. Farbenfabriken Bayer AG. **878 132**
Borazole compounds and method of preparing same. American Cyanamid Co. **878 417**
Process for preparing an unsaturate polyester resin. California Research Corp. **878 090**
Penicillins. Beecham Research Laboratories Ltd [Addition to 870 395.] **878 233**
Apparatus for dispensing polyurethane-forming materials. Imperial Chemical Industries Ltd., and Brown, T. **878 368**
Method of making 3-methylpyridazine. Borchert, P. J. **878 091**
Polymerisation process. Solvic S.A. **878 387**
Production of unsaturated hydrocarbons from liquid hydrocarbons. Badische Anilin- & Soda-Fabrik AG. **878 080**
Dipiperidyl-alkanes. Ciba Ltd. **878 059**
Sulhponamide of the pyridazine series and process for its manufacture. Ciba Ltd. **878 388**
Removal of hydrogen sulphide from hydrocarbons. North Western Gas Board and Clayton Aniline Co. Ltd. **878 251**
Nucleotides and salts thereof and a process for the manufacture of same. Hoffmann-La Roche & Co. AG, F. **878 060**
Production of dimethyl terephthalate. Badische Anilin- & Soda-Fabrik AG. **878 063**
6-Methyl steroids. British Drug Houses Ltd. **878 391**
Method for the purification of acetone. Phenolchemie GmbH. [Addition to 817 149.] **878 065**
Thiocarbamoylhydrazines. Imperial Chemical Industries Ltd. **878 177**
Process for the production of 3,5,3^1,5^1-tetra-substituted 4, 4^1-dihydroxydiphenylmethyl carboxylic acids. Farbenfabriken Bayer AG. **878 393**
Manufacture of polyoxymethylenes. British Industrial Plastics Ltd. **878 163**
1-*o*-Tolyloxyethyl-4-phenylpiperidine. British Drug Houses Ltd. **878 284**
Process and apparatus for acid-reaction. Montecatini. **878 254**
Bonding urethane polymers to rubber and adhesive therefor. Atlantic Refining Co. **878 257**
Process for producing cyclohexanol and cyclohexanone. Inventa Akiengesellschaft für Forschung und Patentverwetung. **878 066**
Low-pressure polymerisation catalyst. Esso Research & Engineering Co. **878 373**
Preparation of basic benzilic acid ester derivatives. Krugmann, T., and Krugmann, M. [trading as Krugmann & Co.] **878 068**
Carbon black manufacture. Columbian Carbon Co. **878 202**
Pyridazine derivatives and a method of preparing same. Osterreichische Stickstoffwerke AG. **878 259**
Polysaccharide material from sassafras plants and process for obtaining it. Ciba Ltd. **878 430**
Substituted quinones. Farbenfabriken Bayer AG. **878 262**
Therapeutic compositions containing sulphonamides. Cassella Farbwerke Mainkur AG. **878 432**
Polyvinyl ester emulsions. Shawinigan Resins Corp. **878 114**
Acetic acid esters. Ciba Ltd. **878 167**
Steroids and the manufacture thereof. Upjohn Co. **878 069**
Polychloroformates. Columbia-Southern Chemical Corp. **878 115**
Pharmaceutical coating compositions. Röhm & Haas GmbH. **878 234**
Production of diakyl esters of iso and/or terephthalic acids. Badische Anilin- & Soda-Fabrik AG. **878 268**
Production of dialkyl esters of iso- and/or terephthalic acids. Badische Anilin- & Soda-Fabrik AG. **878 269**
Process for the stabilisation of chloroprene. Knapsack-Griesheim AG. **878 118**
Nematocidal composition containing a chlorinated ethene compound. Farbwerke Hoechst AG. **878 434**
Aluminium alkoxy and aryloxy hydrides, thus complex salts, with alkali hydrides and the production of same. Badische Anilin- & Soda-Fabrik AG. **878 136**
Method of manufacturing silver catalysts to be used for vapour phase direct oxidation of olefins Furukawa Denki Kogyo Kabushiki Kaisha. **878 435**
Alkanoyloxy-dimethyl- and alkanoyloxy-trimethyl-undecatetraenes, the manufacture thereof and their cyclisation. Hoffmann-La Roche & Co. AG, F. **878 437**
Process for the production of polymeric materials. Dow Chemical Co. **878 438**
Production of oligomers of 1,3-dienes. Badische Anilin- & Soda-Fabrik AG. **878 120**
Aqueous emulsions of epoxy resins. Shell Research Ltd. **878 139**
Catalysts for olefin polymerisation. Grace & Co., W. R. **878 442**
Process for the peroxidation of alpha-olefin polymers. Montecatini. **878 443**
Methods of polymerising vinyl formate. Kurashiki Raijon Kabushiki Kaisha. **878 240**
Resin compositions Shawinigan Chemicals Ltd. **878 287**
Preparation of 1,12-dodecanedioic acid. Esso Research & Engineering Co. [Divided out of 876 335.] **878 241**

Vibrator Motor Solves Problem of Material Lodged in Hopper

A SIMPLE and effective solution to the frequently met problem of dislodging material stuck in a hopper has recently been found in a series of experiments with a vibrator motor supplied by the English Electric Co. Ltd., Strand, London W.C.2. The experiments were done on a hopper handling filter cake at a fertiliser factory in the north of England.

In the process the filter cake flows from the hopper on to a short feeder conveyor incorporating an electronic probe which detects whether or not the material is still flowing. Before the vibrator was installed, the detector operated an alarm which gave an audible signal when the flow stopped. An attendant then had to climb steps from the factory floor to the hopper platform and hit the sides of the hopper with a hammer to start the flow again. The moisture content of the material varies considerably and under certain conditions this had to be done at frequent intervals.

Not only did this interfere with production, it also caused severe damage to the sides of the hopper. It was, in fact, necessary to renew the side panels from time to time, which meant emptying the hopper, burning out the damaged panel and welding in a new one.

In the first experiment a ½-h.p. 3,000 r.p.m. vibrator motor was bolted to a ½-in. steel plate of about twice its own length, and the complete assembly then bolted at its extreme ends to the side of the hopper about half way up. The resultant 'flapping' effect of the centre of the plate against the hopper was sufficient to maintain the flow of material. A short burst of a few seconds' duration every few minutes was found adequate.

Further experiments were carried out to produce a completely flexible system of operation and in the final installation three methods of control were incorporated: (a) a manual push-button starter under the control of the operator; (b) a timer unit which automatically operates the vibrator motor for 10 seconds every 10 minutes; and (c) a relay controlled by the electronic probe, which operates the vibrator in the event of an interruption of the flow of material between the automatically timed bursts. These three methods of control are connected in parallel and are, therefore, supplementary. The installation maintains flow of material without attention.

TRADE NOTES

GfT Chemicals for U.K.

Kingsley and Keith (Chemicals) Ltd., 38 King William Street, London E.C.4, have been appointed U.K. distributors for Gesellschaft für Teerverwertung mbH, Duisburg-Meiderich, Western Germany, with effect from 16 August. The German company manufacture a wide range of coal tar derivatives for industry and research, and among their principal products for regular importation into the U.K. are: diphenyl, symmetrical collidine, dimethylnaphthalene, dimethylphenol, dimethylpyridine, dimethylquinoline, indole, lutidine, methylisoquinoline, methylnaphthalene, methylquinoline, picolines, pseudocumenol, quinoline and xylenol fractions.

Sulphur Inhibitor

Some typical results from the use of Desulfurol—a sulphur inhibitor and fuel oil improver for furnaces, ovens and kilns, produced by Combustion Chemicals Ltd., 33 Dorset Square, London N.W.1—are shown in a booklet, Ref. 250/61, produced by the company. Full details of the Desulfurol fuel treatment process are contained in booklet 101/61.

Peroxy Catalyst

Perkadox IPP—di-*iso*propyl peroxydicarbonate—is now being produced on a small scale by Novadel Ltd., St. Ann's Crescent, Wandsworth, London S.W.18. The compound is recommended for use in the polymerisation of vinyl monomers, alkyl and acrylic esters, olefins and polyester mixtures. Perkadox IPP is active at a lower temperature than other peroxy catalysts and improved linearity may be expected, it is claimed.

Q. & Q. Distributors

Jencons (Scientific) Ltd., Mark Road, Hemel Hempstead, Hertfordshire, have been appointed distributors for Quickfit and Quartz interchangeable laboratory glassware.

Pumping Brochure

'Pumping' is the title of a new 12-page illustrated brochure now available from Parkinson Cowan Measurement, Tameside Works, Dobcross, Oldham, Lancashire. The second of a new series of three, it outlines the construction of the Rotoplunge pump, a versatile unit which has only three moving parts. There is also a section describing the Shoflo sight flow indicator for pipeline applications.

Thiodipropionic Acid

A four page technical brochure on thiodipropionic acid is being offered by Evans Chemetics Inc., 250 East 43rd Street, New York 17, N.Y., U.S. Thiodipropionic acid is an antioxidant and it is also of interest as a synergist in combination with the butylated hydroxyanisole type of antioxidant. In addition, it inhibits the development of oxidised flavours in milk and milk products and stabilises soybean oil against flavour and oxidative deterioration. The brochure lists properties and further uses.

Oxygen Equipment Lubricants

Bulletin No. 42, a report on Fluorolubes—safe lubricants for oxygen equipment—is available from Omni (G.B.) Ltd., 35 Dover Street, London W.1. The report, prepared by Hooker Chemical Corp., presents laboratory test data from various sources. Fluorolubes are a series of lubricants which are non-inflammable and resistant to oxidation.

Fuel Treatment

Test data booklet 250/61 issued by Combustion Chemicals Ltd., 33 Dorset Square, London N.W.1, gives typical results from the use of Desulfurol fuel treatment in furnace, oven and kiln operation. The data presented indicate the ability of Desulfurol, when added to the fuel oil at one part per thousand, to alleviate such problems as burner coking, sulphur fumes and sulphur contamination of the product or wares.

Amber Additive

Yorkshire Imperial Metals, users of heavy residual fuel oil for the refining of copper at their Kirby Works, find that the addition of Amber SSR 511 reduces coking in the burner, resulting in a worthwhile reduction in maintenance costs, according to the manufacturers of this chemical compound, the Amber Chemical Co. Ltd., 11a Albemarle Street, London W.1.

Amber SSR 511 is designed primarily to overcome sludge, and to solve other problems arising in the burning of heavy fuel oil, notably those of soot and scale formation and carbon deposits on burner tips, all of which, it is claimed, are alleviated by the use of the treatment.

Thixotropic Polyester Resin

An advance information sheet (P18) on Resin DSR 19132 has been issued by Bakelite Ltd., 12-18 Grosvenor Gardens, London S.W.1. This is a ready-for-use thixotropic polyester resin for wet lay-up laminated applications where cure at low temperatures is required.

Extrusion Compounds

Vybak (p.v.c.) extrusion compounds are the subject of a new folder from Bakelite Ltd., 12-18 Grosvenor Gardens, London S.W.1. The folder describes the properties and uses of the dielectric and sheathing compounds and general purpose compounds which are available in flexible opaque grades, flexible clear and rigid.

Temperature Controller

Independent circuits allowing control of any two points through one instrument are a feature of a new mercury-in-steel, on/off temperature controller produced by the British Rototherm Co. Ltd., Merton Abbey, London S.W.19. Each of the two controller circuits consists of alloy steel Bourdon tubes, capillaries and temperature sensitive bulbs, operating mercury switches rated up to 30 amps at 230/250 A.C. The differential is fixed but varies with switching capacity.

Indicator lamps and bottom entry electrical conduit are standard. Temperature ranges are available between minus 20°F and plus 1000°F (minimum coverage 100°F) and the equivalent °C. The case is aluminium alloy and the standard capillaries 10 ft. copper sheathed with mild steel bulbs screwed ½ in. B.S.P.

Market Reports

FAIR ACTIVITY IN EXPORT MARKET

LONDON Conditions on the industrial chemicals market are little changed, but there has been a steady movement against contracts, and a reasonably good volume of overseas enquiry covering a wide range of chemicals. Prices for the most part are steady at recent levels.

There has been nothing of fresh interest to report on the agricultural chemicals market, while business in the coal tar products continues on a steady basis, with the supply position satisfactory.

MANCHESTER Owing primarily to continued holiday influences, fresh buying of textile bleaching, dyeing and finishing chemicals, as well as of other industrial descriptions has been on a reduced scale, while stoppages at the consuming end have also left their mark on the pressure of deliveries under contracts. Sellers generally, however, are anticipating with some confidence on improvement in trading conditions within the next few weeks. Meanwhile, market values are held on a steady to firm basis.

SCOTLAND With most areas now returned to more or less normal trading conditions, business during the past week has been quite brisk. Demands for the home trade have been steady in regard to both spot and contract requirements, with quantity levels maintained and in particular those pertaining to the textile industries. The usual range of acids, hypos and caustics featured well.

Prices have shown little change, although a reduction in some of the plasticisers was welcomed. The position in regard to agricultural chemicals remains unchanged with the prevailing seasonal quietness while the overseas market continues fairly active.

BRITISH CHEMICAL PRICES

GENERAL CHEMICALS

Acetic Acid. 10-ton quantities, 80% tech. in bulk, £77 per ton; in casks, £90 per ton; 80% pure in bulk, £83; in casks, £94; glacial, 98/100% in bulk, £93; in drums, £100.

Acetic Anhydride. Ton lots d/d, £128.

Alum. Ground, f.o.r., about £25.
MANCHESTER: Ground, £25.

Aluminium Sulphate. Ex-works, d/d, £15 10s to £18.
MANCHESTER: £16 to £18.

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

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

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

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

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

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

Arsenic. Ex-store, £45 to £50.

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

Barium Chloride. 2-ton lots, £45.

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

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

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

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

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

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

Chromic Acid. In 1-ton lots, per lb., 2s 2¾d.

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

Citric Acid—Granular. In kegs, 1-4 cwt. lots, per cwt., £9 6s; 5-19 cwt. lots, per cwt., £9 2s; 1-ton lots, per cwt., £9 1s; packed in paper bags, 1-4 cwt. lots, per cwt., £8 19s; 5-19 cwt. lots, per cwt., £8 15s; 1-ton lots, per cwt., £8 14s.

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

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

Copper Sulphate. £78 per ton less 2% f.o.b. Liverpool.

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

Formaldehyde. In casks, d/d, £40.

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

Glycerine. Chem. pure, double distilled 1.2627 s.g., per cwt., in 5-cwt. drums for annual purchases of over 5-ton lots and under 25 tons, £11 2s. Refined technical grade industrial, 5s per cwt. less than chem. pure.

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

Hydrofluoric Acid. 60%, per lb., about 1s 2d.

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

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

All prices per ton unless otherwise stated

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

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

Lactic Acid. Edible, d/d, 50% by wt., per lb., 16¾d; 80% by wt., 26½d; C.P., 50% by wt., per lb., 14½d; 80% by wt., 23d; dark tech., ex-works, 44% by wt., per lb. 9d. 1-ton lots, loaned containers.

Lead Acetate. White, about £154.

Lead Nitrate. 1-ton lots, about £135.

Lead, Red. Bases prices: 15-cwt. drum lots, Genuine dry red, £99 5s per ton; orange lead, £111 5s per ton; Ground in oil: red, £121 5s, orange, £133 5s.

Lead, White, Bases prices: in 5-cwt. drums, per ton for 2-ton lots, Dry English £112 5s; Ground in oil, £132 10s.

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

Litharge. In 5-cwt. drum lots, £101 5s per ton.

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

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

Magnesium Chloride. Solid (ex-wharf), £19 7s 6d per ton.

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

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

Mercuric Chloride. Tech. powder, per lb., for 1-ton lots, in 28-lb. parcels, 19s 6d; 5-cwt. lots, in 28-lb. parcels, 20s; 1-cwt. lots, in 28-lb. parcels, 20s 3d.

Mercury Sulphide, Red. Per lb. for 5-cwt. lots in 28-lb. parcels, £1 10s 6d; 1-cwt. lots, in 28-lb. parcels, £1 11s.

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

Nitric Acid. 80° Tw., £35 2s.

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

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

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

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

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

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

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

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

Potassium Permanganate. BP, 1-cwt. lots, per lb., 2s 0¼d; 3-cwt. lots, per lb., 1s 11¾d; 5-cwt. lots, per lb., 1s 11¼d; 1-ton lots, per lb., 1s 11d; 5-ton lots, per lb., 1s 10½d. Tech., 1-ton lots in 1-cwt. drums, per cwt., £10 3s; 5-cwt. in 1-cwt. drums, per cwt., £10 5s; 1-cwt. lots, £10 14s.

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

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

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

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

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

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

Sodium Bisulphite. Powder, 60/62%, d/d 2-ton lots for home trade, £46 2s 6d.

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

Sodium Chlorate. 1-cwt. crums, c.p. station, in 5-ton lots, about £87 per ton.

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

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

Sodium Fluoride. D/d, 1-ton lots and over, per cwt., £5; 1-cwt. lots, per cwt., £5 10s.

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

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

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

Sodium Metaphosphate. Flaked, paper sacks, £136.

Sodium Metasilicate. (Spot prices) D/d UK in 1-ton lots, 1-cwt. free paper bags, £29.

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

Sodium Nitrite. 4-ton lots, £32.

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

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

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

Sodium Silicate. (Spot prices) 75-84° Tw. Lancs and Ches, 6-ton lots, d/d station in loaned drums, £12 10s; Dorset, Somerset and Devon, per ton extra, £3 5s; Scotland and S. Wales, extra, £2 17s 6d. Elsewhere in England, not Cornwall, extra, £1.

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

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

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

Sodium Sulphide. 60/62%, spot, d/d, in drums in 1-ton lots, solid, £38 2s 6d; broken, £39 2s 6d. Flakes, £40 12s 6d, crystals, £29 10s.

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

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

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

Tartaric Acid—Powder and Granular. Per cwt.: 10 cwt. or more, in kegs, 294s; in bags, 286s per cwt.

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

Zinc Oxide. Per ton: white seal, £97 10s, green seal, £95 10s.; red seal, £92 10s.

SOLVENTS AND PLASTICISERS

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

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

Butyl Acetate BSS. 10-ton lots, £165.

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

***sec*-Butyl Alcohol.** All d/d. In 5-gal. drums, £168; in 10-gal. drums, £158 in 40-45 gal. drums, under 1 ton, £133; 1-5 tons, £130; 5-10 tons, £129; 10 tons and up, £128; in 400-gal. tank wagons, £125.

***tert*-Butyl Alcohol.** 5-gal. drums, £195 10s; 40/45-gal. drums: 1 ton, £175 10s; 1-5 tons, £174 10s; 5-10 tons, £173 10s; 10 tons and up, £172 10s.

Diacetone Alcohol. Small lots: 5-gal. drums, £185; 10-gal. drums, £175. 40/45-gal. drums: under 1 ton, £148; 1-5 tons, £147; 5-10 tons, £146; 10 tons and over, £145, in 400-gal. tank wagons, £142.

Dibutyl Phthalate. In drums, 10 tons, d/d per ton, £216; 45-gal. 1-4 drums, £222.

Diethyl Phthalate. *In drums, 10 tons, per* ton, £201; 45-gal. 1-4 drums, £207.

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

Dioctyl Phthalate. In drums, 10 tons, d/d, per ton, £287; 45-gal. 1-4 drums, £293.

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

Ethyl Acetate. 10-ton lots, d/d, £137.

Ethyl Alcohol Fermentation grade (PBF 66 o.p.). Over 300,000 p. gal., 3s 10½d; d/d in tankers, 2,500-10,000 p. gal. per p. gal., 4s 0¾d. D/d in 40/45-gal. drums, p.p.g. extra, 2d.
Absolute alcohol (74.5 o.p.), p.p.g. extra, 2d.

Methanol. Pure synthetic, d/d, £46.

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

Methyl Ethyl Ketone. All d/d. in 40/45-gal. drums, under 1 ton, £143 10s; 1-5 tons, £138 10s; 5-10 tons, £136 10s; 10 tons and up, £143; in 400-gal. tank wagons, £134 10s.

Methyl *iso*Butyl Carbinol. All d/d. In 5-gal. drums, £203; in 10-gal. drums, £193; 40-45 gal. drums, less than 1 ton, £168; 1-9 tons, £165; 10 tons and over, £163; in 400-gal. tank wagons, £160.

Methyl *iso*Butyl Ketone. All d/d. In 5-gal. drums, £209; in 10-gal. drums, £199; in 40/45-gal. drums, under 1 ton, £174; 1-5 tons, £171; 5-10 tons, £170; 10 tons and up, £169; in 400-gal. tank wagons, £166.

***so*Propyl Acetate.** 10 tons, d/d, 45-gal. drums £132.

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

RUBBER CHEMICALS

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

Carbon Black. GPF: Ex-store, Swansea. Min. 3-ton lots, one delivery, 6¾d per lb.; min. 1-ton lots and up to 3-tons, one delivery, 7d per lb.; ex-store, Manchester, London and Glasgow, 7¾d per lb. HAF: ex-store, Swansea; Min. 3-ton lots, one delivery, 7¾d per lb.; min. 1-ton lots and up to 3-tons, one delivery, 8d per lb. Ex-store Manchester, London and Glasgow, 8¾d per lb ISAF: Ex-store Swansea, min. 3-ton lots in one delivery, 9¾d per lb., min. 1-ton lots and up to 3-tons in one delivery, 10d per lb. Ex-store Manchester, London and Glasgow, 10¾d per lb.

Carbon Tetrachloride. Ton lots, £83 15s.

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

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

Mineral Black. £7 10s-£10.

Sulphur Chloride. British, about £50.

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

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

COAL TAR PRODUCTS

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

Carbolic Acid. Crystals, d/d bulk, per lb. 1s 3d; 40/50-gal. ret. drums extra, per lb., ½d.

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

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

Naphtha. Solvent, 90/160°, per gal., 5s heavy, 90/190°, for bulk 1,000-gal. lots, d/d, per gal., 4s. Drums extra ; higher prices for smaller lots.

Naphthalene. Crude, 4-ton lots, in buyers' bags, nominal, according to m.p.: £22-£30; hot pressed, bulk, ex-works, £40; refined crystals, d/d min. 4-ton lots, £65-£68.

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

Pyridine. 90/160, per gal., 20s about.

Toluol. Pure, per gal., 5s ; 90's 2,000 gal. in bulk, per gal., 4s 9d.
MANCHESTER: Pure, naked, per gal., 5s 6d.

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

INTERMEDIATES AND DYES
(Prices Normal)

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

***o*-Cresol** 30/31°C. D/d, per lb., 1s.

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

Dichloraniline. Per lb., 4s 6d.

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

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

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

Nitrobenzene. Spot, 90 gal. drums (drums extra), 1-ton lots, d/d, per lb., 10d.

Nitronaphthalene. Per lb., 2s 5½d.

***o*-Toluidine.** 8-10 cwt. drums (drums extra), per lb., 1s 11d.

***p*-Toluidine.** In casks, per lb., 6s 1d.

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

Sewage Sludge Treatment in the Chemical Industry

Six papers to be presented at a symposium on 'The treatment of industrial and sewage sludges' in London on 20 December include one on 'Chemical industry solids disposal problems', by M. E. Chodak, *senior mechanical engineer*, Albright and Wilson (Mfg.) Ltd. The symposium is being held by the Metropolitan and Southern Branch of the Institute of Sewage Purification and the hon. symposium secretary is Mr. A. F. Green, 37 Frensham Road, New Eltham, London S.E.9.

Mobil's Review of Plastics

DEVELOPMENTS in plastics applications are the subject of 'Mobil Industrial Review', published by Mobil Oil Co. Ltd., Caxton House, Tothill Street, London S.W.1. The publication covers uses in electrical engineering, carbon compounds, building, textiles, man-made fibres, packaging, adhesives, etc.

U.K. production of plastics in 1960 is estimated as follows:

Thermosetting	**Tons**
Alkyds	51,000
Amino	60.000
Phenolics	77,000
Polyesters	9,000
Casein	1,000
Others (epoxy. polyurethanes, etc.)	12,000
Thermoplastics	
P.V.C.	148,000
Polythene	105,000
Polystyrene	40.000
Acrylics	20.000
Polyvinyl acetate	15,000
Cellulose acetate	11,000
Others (nylon, etc.)	1,000
Total	550,000

Electronic Data Processing

'Invoicing', by A. J. Brockbank, Glaxo Laboratories Ltd., and 'Provisioning 1,300 shops', by D. S. Greensmith, Boots Pure Drug Co., will be two of the papers presented at the 'Electronic Data Processing Symposium' to be held at Olympia, London, 4-6 October. The symposium is connected with the Electronic Computer Exhibition, Olympia, 3-12 October.

Under the heading 'Earning with computers', speakers from leading firms and organisations will talk of their practical experience of data processing by computer. Programme and tickets for the symposium are available from the Electronic Computer Exhibition organising office at 64 Cannon Street, London E.C.4.

Course for Food Chemists

A two-year course for young chemists working in the food industries, leading to the Higher National Certificate in Applied Chemistry (Food Industries) commences at the West Ham College of Technology, Romford Road, West Ham, London E.15, on 19 September. The course involves attendance at the college for one whole day per week and students should already hold the Ordinary National Certificate in Chemistry.

Course on Recent Polymer Developments

Recent developments in the chemistry and technology of polymers is the subject of a special short course to be held at the Bradford Institute of Technology, Department of Chemical Technology, on 17 and 18 November 1961. Fee for the course is £2 5s. Organiser is Dr. W. R. Moore, Reader in High Polymer Chemistry, Institute of Technology, Bradford 7.

CLASSIFIED ADVERTISEMENTS

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

EDUCATIONAL

Surrey County Council
KINGSTON TECHNICAL COLLEGE
FULL-TIME COURSES IN CHEMISTRY

Applications are invited for the following courses which will commence in September 1961:

Graduateship of the Royal Institute of Chemistry, Part II
A three-term full-time course for those who, at the time of enrolment, have passed Part I, or who have been granted exemption from and have reached the standard of Part I.

Higher National Diploma in Chemistry
A two-year full-time course for the Higher National Diploma in Chemistry with special reference to Analytical Chemistry, open to those who have (a) A-level Chemistry with Physics and Mathematics taken beyond O-level, or (b) O.N.C. Chemistry.

Further details and forms of application from Head of Department of Chemistry, Biology and Geology, Kingston Technical College, Fassett Road, Kingston upon Thames, Surrey.

MATERIALS FOR SALE

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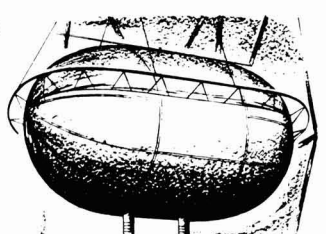

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