

Chemical Age

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PETROCHEMICALS and POLYMERS

9 December 1961. Vol. 86. No. 2213

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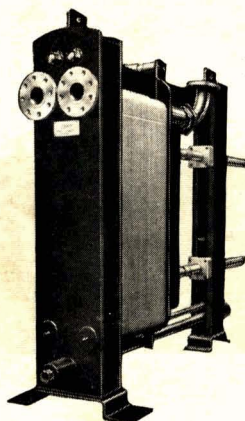
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THE WEEKLY NEWSPAPER OF THE CHEMICAL INDUSTRY



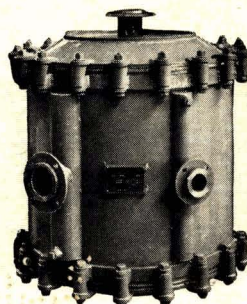
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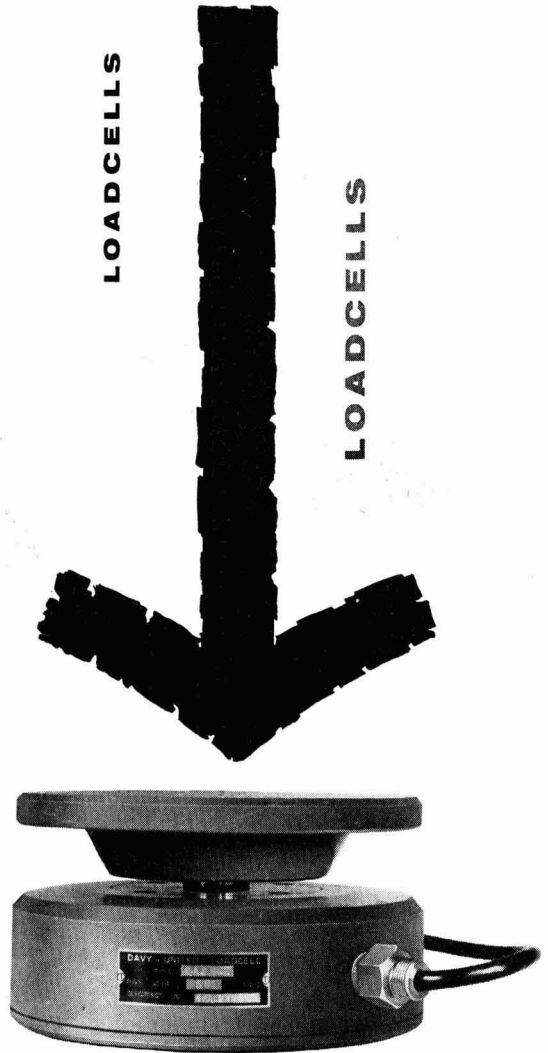
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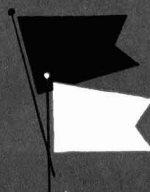
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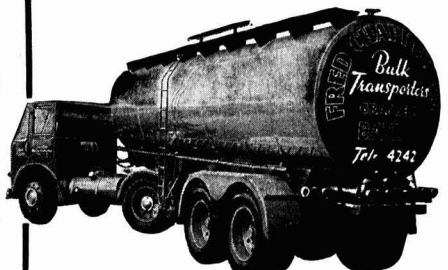
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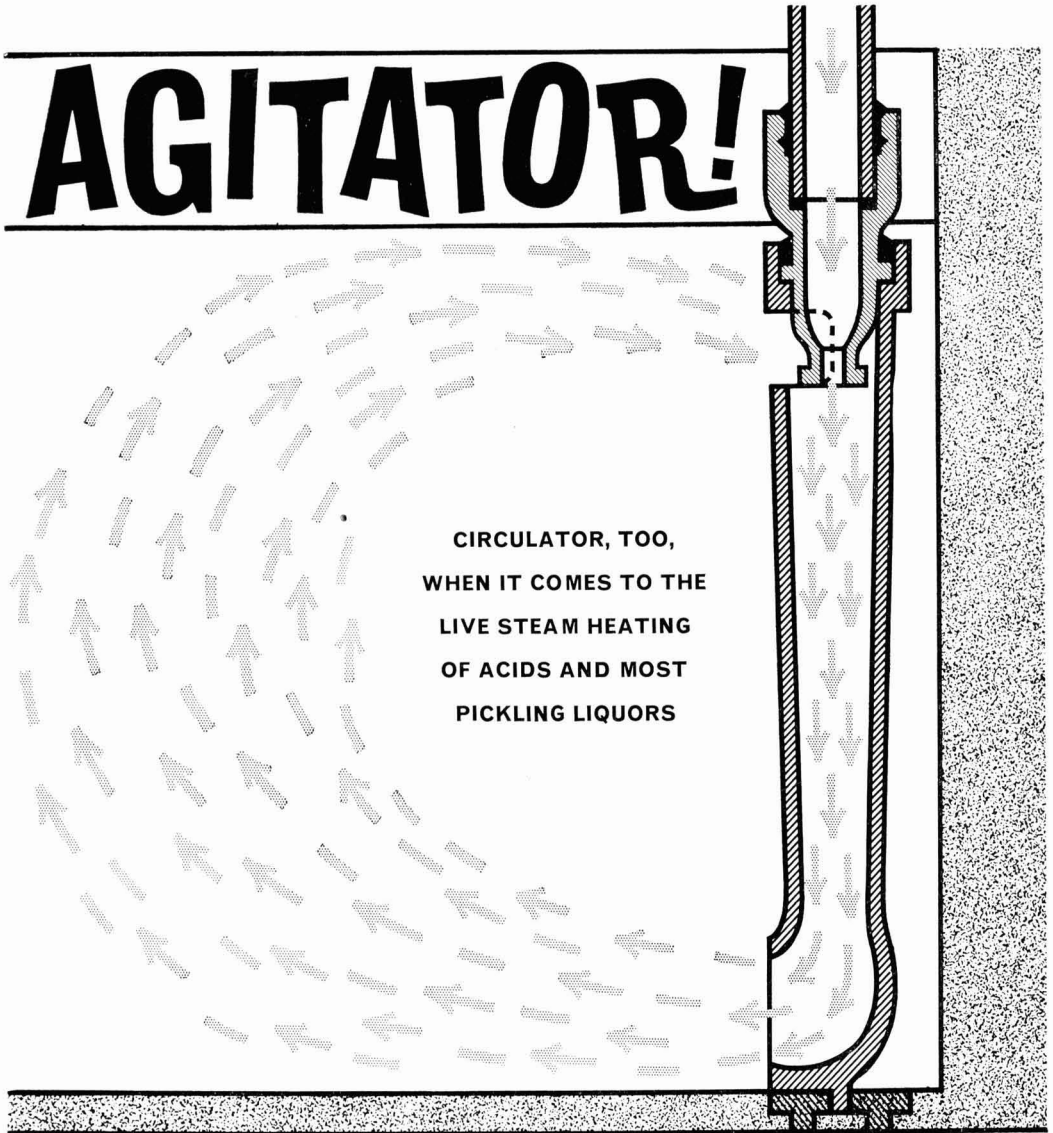
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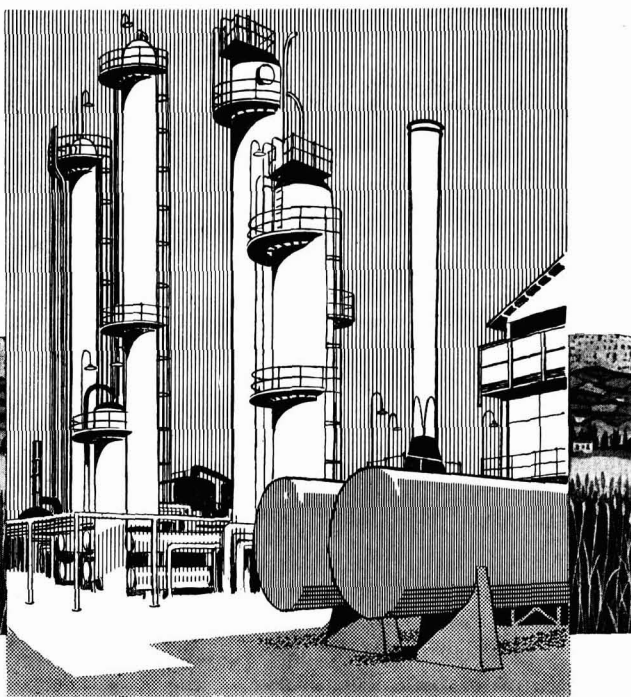
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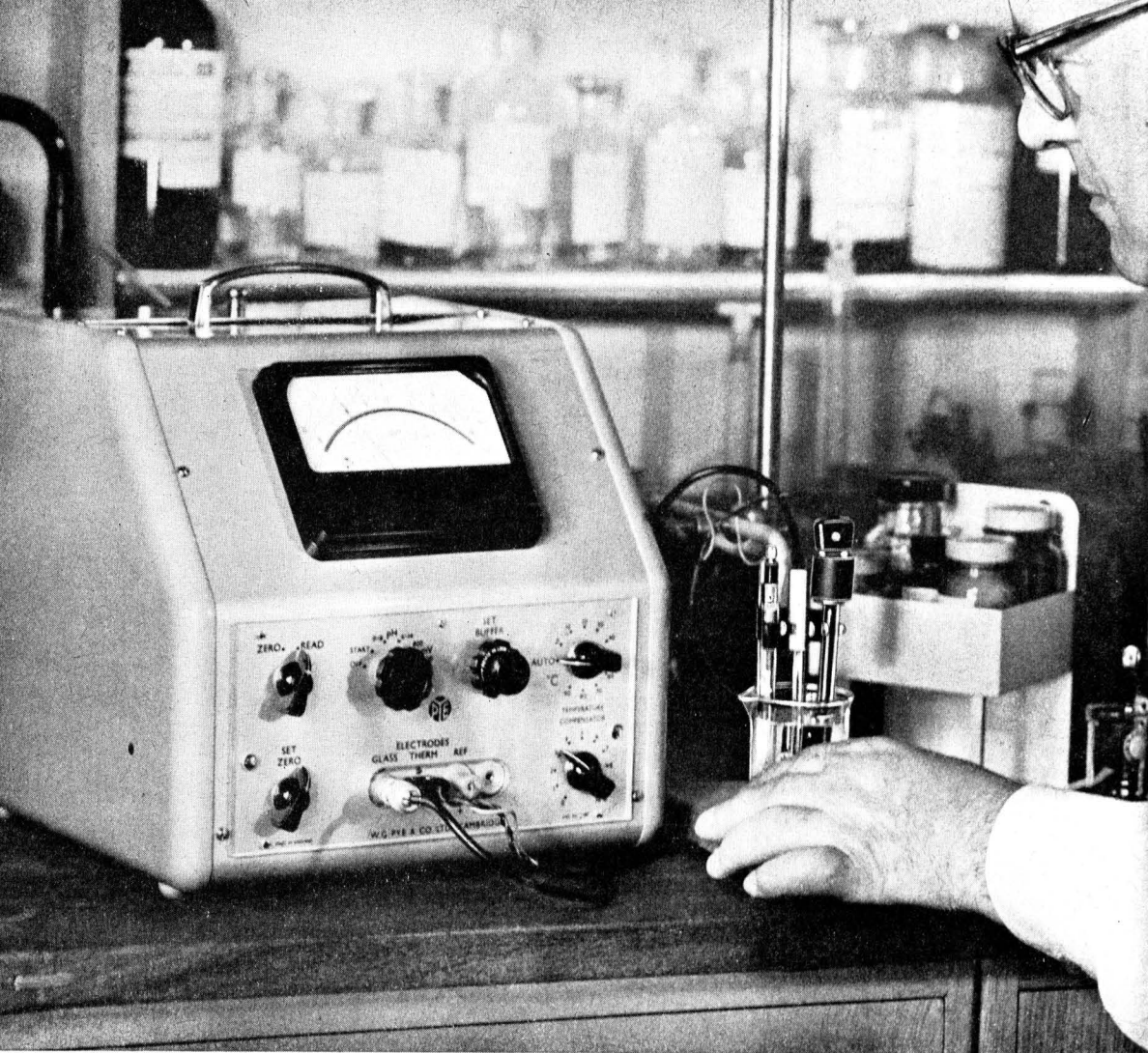
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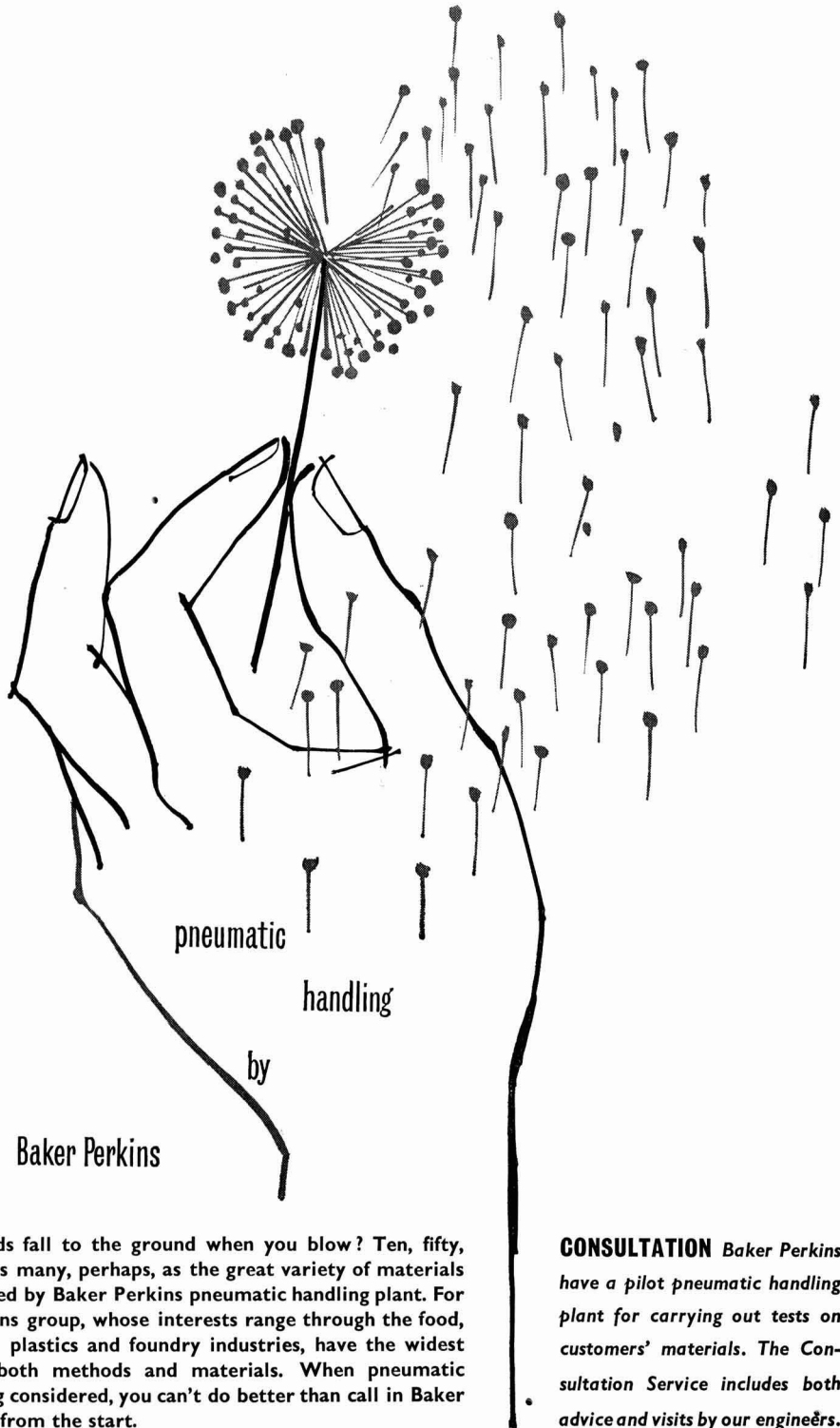
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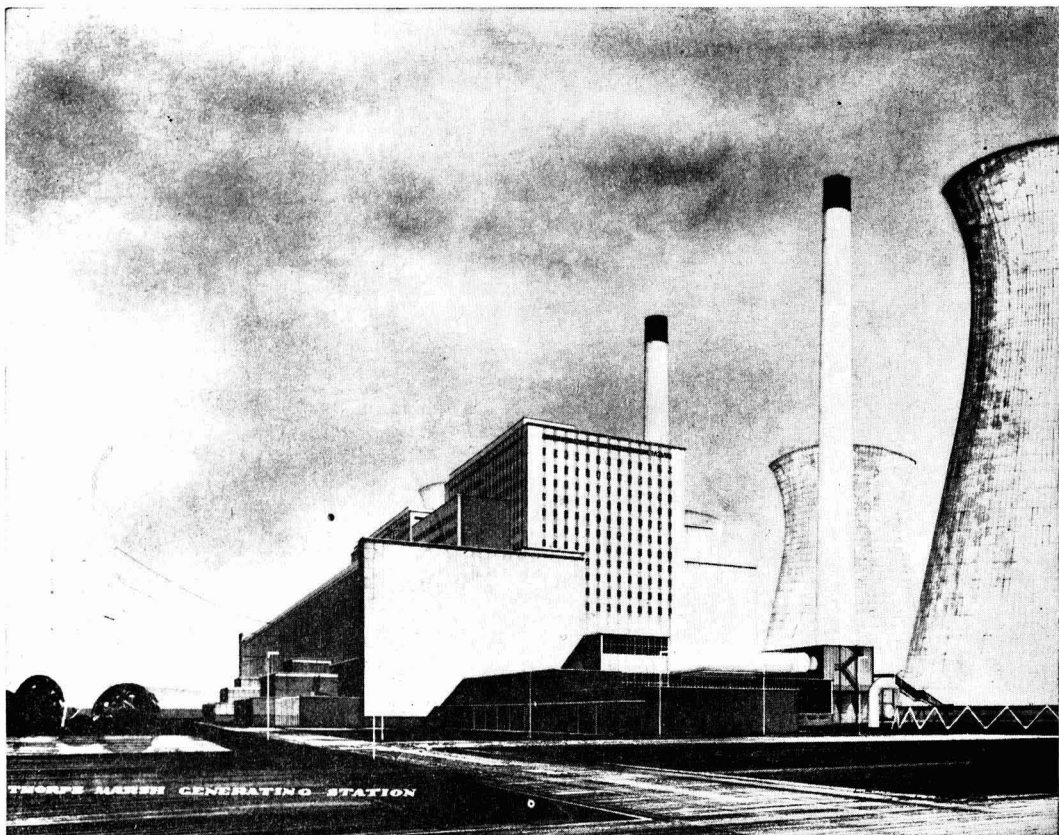
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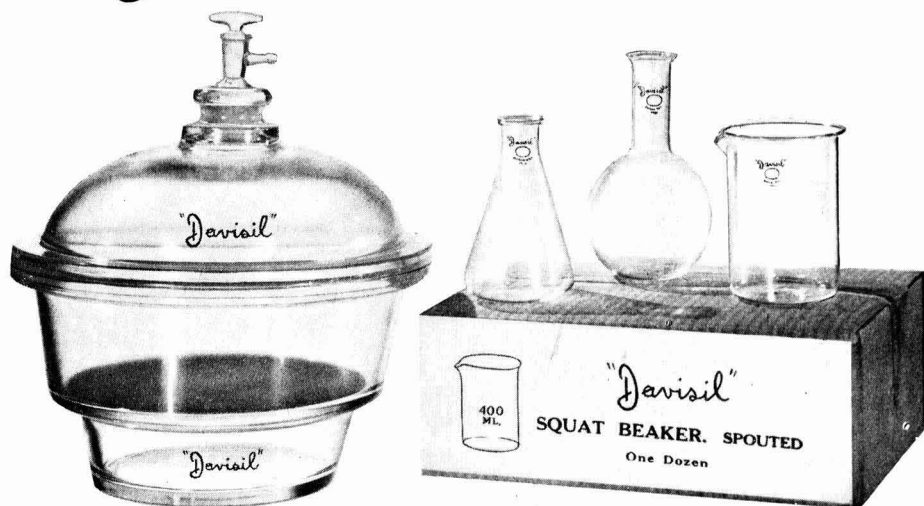


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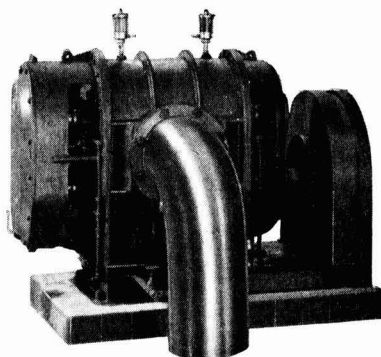
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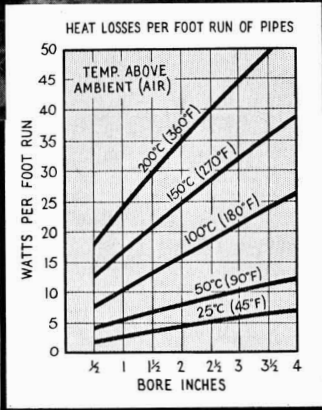
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 3, 3-Dimethyl butane
 I, 2-Dimethyl cyclopentanone
 2, 2-Dimethyl pentyl acetate
 2, 2-Dimethyl propanol pure
 2, 2-Dimethyl propyl acetate
 2, 2-Dimethyl propyl chloride
 Dimethyl sulphone
 N,O-Dimethyl isothiuronium iodide
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 2,7-Dinitrofluorene
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 Docosa-IO, 12-diyne-dioic acid
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 N'-tetrapropionic acid
 Ethyl N-t.-butyl carbamate
 Ethyl t.-butyl carbonate
 Heptanediol-I, 7
 Hexahydroindane (cis/trans)
 3-Hexanol
 n-Hexatriacontane
 2-gamma-Hydroxy propyl pyridine
 3-gamma-Hydroxy propyl pyridine
 4-gamma-Hydroxy propyl pyridine
 Isophthalic acid (= meta-phthalic acid)
 Isopropylcyclohexane
 6-Ketoundecane-1, 11-dioic acid
 2-Methyl-5-aminohexane
 3-Methyl butene-I 99%
 Methyl N-t.-butyl carbamate
 2-Methyl cyclopentanone
 2-Methyl heptane
 I-Methyl heptylamine-I (= 2-Octylamine)
 2-Methyl hexane
 4-Methyl hexene-I 99%
 5-Methyl hexene-I 99%
 Methyl hydrogen adipate
 Methyl 2-hydroxycyclohexane carboxylate
 2-Methyl imidazole
 Methyl t.-butyl carbonate
 N-Methyl-3-hydroxy piperidine
 2-Methyl octane
 3-Methyl octane
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 DL-a-Methyl serine
 2-Methyl tetrahydrofuran
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 4-Nitrophenylazo-4-benzoyl chloride
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 Octane-1, 8-diol
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COAL AND METHANE

THE strong attack, on behalf of the coal industry, on the Government's decision to support the Gas Council's import of Saharan liquid methane reached a climax in the House of Commons last week when Mr. J. Boyden (Lab., Bishop Auckland) raised the question of an adjournment debate. It is unlikely that the last has been heard on this score, despite the fact that Mr. J. C. George, Parliamentary Secretary to the Ministry of Power, put the Government's case clearly and with some force.

He refused to disclose the internal commercial arrangements made between the various gas boards and pointed out that had imports been refused, something else would have taken the place of methane by way of petroleum products. Conditions in the supplying area were not and could not be the province of the Minister of Power. There was also no reason to think the public would be inconvenienced in any way should supplies be interrupted. Standby plant would be used and the methane processing plant could also be set to use other petroleum products.

The current study of the Lurgi projects was in no way prejudiced by permission to import methane. The study group would report in a few months and only then would the Ministry have any idea about the price at which Lurgi plants could supply towns gas.

Liquid methane would be supplied to the boards at 7½d/therm. There would be a ½d rebate from the Gas Council's half share in British Methane Ltd., who hired the tankers and that ½d would be passed back to the area boards, making a net price of 7d. Reformed into towns gas, it would cost 8½d, but quite a large percentage would be used for enriching Lurgi gas and the proportion used for that purpose would be supplied at 7d/therm. The proportion of methane in the Lurgi gas will be 50%.

Since the weaker Lurgi gas will be used to dilute the rich methane in order to make it a commercial proposition, it is clear that the presence of methane will help the study group to favour the Lurgi plant. If the Lurgi process is shown to provide a cheap, competitive and safe method of generating gas, then the Lurgi plant will come in the development plans of the gas boards.

The whole of the Gas Council's investment is in the United Kingdom; the council will bear no part of the costs of investment in North Africa. As previously reported, the cost to the council will be £18 million, in storage tanks and pipelines. However, this does not give the true picture because some £6 million worth of plant, previously planned, will not now be built. Therefore capital spending due to this new venture will be £12 million inside the U.K.

Despite the heavy attack by the coal lobby, it is clear that the Gas Council is entitled to much credit for the way it has handled the long and difficult negotiations. The result has been to give the morale of the gas industry a big boost for it has passed through a difficult period since nationalisation.

The Select Committee's estimate that the consumption of coal by the Gas Council might drop by 2% following the import of Saharan methane is not the whole picture, for it has been estimated that gas consumption

(Continued on page 918)

Sir Alan Wilson to become new Courtaulds chairman

WHEN Sir John Hanbury-Williams, C.V.O., retires from the chairmanship of Courtaulds Ltd. and relinquishes his directorship at the end of the next annual general meeting to be held in July 1962, he will be succeeded by Sir Alan Wilson, F.R.S. Mr. C. F. Kearton, O.B.E., F.R.S., and Mr. H. R. Mathys have been appointed additional deputy chairmen.

Sir John joined Courtaulds in 1926 and was concerned with developing exports of rayon yarns. He was elected to the board four years later and became a managing director in 1935, deputy chairman in 1943 and chairman in 1946. He was created a Knight Bachelor in 1950. He is a director of the Bank of England and of Snia Viscosa.

Sir Alan, who worked on atomic energy during the war, was elected a Fellow of the Royal Society in 1942 and

Ltd., he is also chairman of the Electricity Supply Research Council and a part-time member of the Atomic Energy Authority.

Mr. Mathys joined Courtaulds in 1946 to take charge of the patent department at Coventry. He became a director in 1954 and is at present chairman of British Cellophane Ltd. and deputy chairman of B.N.S. A member of the F.B.I. Grand Council, he is a vice-president of the Trademarks, Patents and Designs Federation.

Pfizer plan to make polyethers

FOLLOWING the reorganisation of their U.K. operations, with the formation of a separate Chemical Division (C.A., 2 December, p. 885), Pfizer Ltd. have now disclosed their intention of venturing into the plastics field—initially by the manufacture of propylene oxide and polyethers, for which plans "are well advanced". Pfizer are not disposed, at present, to go into any details of when and where plants for this purpose will be built, merely indicating that these plans are in line with their policy of diversification. It is to be presumed that Pfizer's production of polyethers would be aimed mainly at the considerable market for these plastics in the manufacture of urethane foam.

Pesticides under control, but more research needed

THE need for more fundamental and applied research into various problems arising from the use of toxic chemicals in agriculture and food storage is confirmed in the report of the Government-appointed research study group, published as we go to press (H.M.S.O., 4s 6d). The report reaches the broad conclusion that the arrangements now in force have been generally successful in ensuring the safe use of pesticides. The research group found no evidence, for example, of adverse effects on the health of consumers and considered that agricultural and other workers were well protected by the regulations in force.

On wild birds and wild life, the report states that, while the great majority of chemicals apparently do no harm, a few are dangerous and more work needs to be done in this field.

After a thorough study of the considerable amount of research now going on into the use of toxic chemicals in agriculture and food storage, the group concluded that no important aspect has been entirely neglected. They found, however, that there is need for more knowledge of toxic chemicals and their effects. They detail a number of directions in which further fundamental and applied research might profitably be conducted. They point out that experience in the use of pesticides often brings to light matters on which knowledge is inadequate, and that the introduction of new chemicals and new methods of control is continually changing the position. The group consider that it is not necessary for any body to be set up, to co-ordinate the continuing and expanding research which is required, existing bodies being adequate to conduct research and to keep Government Departments informed.

In the course of their report, the group note that much research is done by industry in discovering and developing improved types of pesticides and in supplying the information required under the Notification Scheme, particu-

larly on toxicity and residues. The number of new chemicals currently proposed as pesticides indicates considerable activity in the search for more selective, more efficient and less poisonous products.

The research study group was appointed in February 1960 by the Minister of Agriculture, Fisheries and Food, the Minister for Science, the Secretary of State for Scotland and the Minister of Health, to study the need for further research into the effects of the use of toxic chemicals in agriculture and food storage and to make recommendations.

U.K. seeks tariff cuts in C.M. talks

CERTAIN chemical and petroleum products are among 25 items for which Britain is asking for duty to be removed or reduced to a low level as exceptions to the common external tariff in the Common Market negotiations. These items are reported to include certain chemical products, sulphur (for which the common external tariff is already nil), cadmium (c.e.t., 5%) and others. These are in addition to the five basic items of aluminium, lead, zinc, woodpulp and newsprint.

Coal and Methane

(Continued from page 917)

will rise by 1% per year. The coal industry, therefore, is likely to suffer very little from this far-reaching project and it would almost certainly have spelt the end of any gas industry expansion had the Government heeded the strong, at times virulent and almost always illogical opposing arguments.



Sir Alan Wilson



Sir J. Hanbury-Williams



H. R. Mathys



C. F. Kearton

joined the Courtaulds' board in 1945 with special responsibilities for research and development. He became a deputy chairman in 1957. Sir Alan, who is chairman of Pinchin, Johnson and Associates and of British Nylon Spinners Ltd., was chairman of the committee that reported recently on coal derivatives. He is also a member of the Advisory Council on Scientific Policy and a part-time member of the Iron and Steel Board.

Mr. Kearton also worked on atomic energy projects in the war and was awarded the O.B.E. in 1945. He was elected a Fellow of the Royal Society in 1961. Joining Courtaulds in 1946 with responsibility for chemical engineering research, he was appointed to the board in 1952. Chairman of British Celanese

Project News

Q.V.F. glassware orders from Italy and Guatemala

● AN ORDER worth £9,000 has been awarded to **Q.V.F.**, chemical engineers in glass, by the Zambelletti Co., Varese, Italy, for the supply of eight complete reaction and distillation units, with three glass pumps.

Their first order for industrial glassware from Guatemala has also been received by Q.V.F. Ltd. The Central Institute of Technological Research have ordered two distillation units and a Soxhlet extractor, worth £1,000 in all.

In addition, Q.V.F. have got their first order from Japan—glass pipeline and fittings for delivery to the Osaka Soda Co. Ltd.

Warne oil spill booms for Esso

● A CONTRACT worth £20,000 to equip ocean berths at the **Esso Fawley** terminal with Warne oil spill booms has been awarded to **William Warne and Co. Ltd.**, who recently received a contract for an installation for the oil basin at Dunkirk. Warne booms comprise a neoprene tube reinforced with a synthetic fabric and a weighted skirt to prevent oil passing beneath it.

I.C.I. order motors for gas compressors

● AN ORDER for two synchronous motors to drive synthesis gas compressors for ammonia production have been placed with **Bruce Peebles and Co. Ltd.**, Edinburgh 5, for the **I.C.I. Billingham Division's** plant at Severnside. The two 5,900 h.p. 250 r.p.m. 11 kV unity power factor motors—the largest ever built in Scotland—will be designed for direct-in-line starting with a starting current of four times full-load and will be separately excited from high-speed induction motor-driven exciter sets.

The control cubicles will include special equipment to facilitate the 'phasing' of the outputs of the two six-cylinder compressors. Hydraulically-operated stator racking gear will facilitate rotor inspection and maintenance. Motor-operated barring gear is also to be fitted.

A. & W. finishing process for London Aluminium

● SUPPLY to the **London Aluminium Co. Ltd.** at Wombourne, Wolverhampton, of a complete installation for providing finishing processes on aluminium is announced by **Albright and Wilson Ltd.** The processes concerned are Phosphoric 159 chemical polishing and sulphuric acid anodising, together with necessary pre- and after-treatment.

The plant is 78 ft. long, 12 ft. 6 in. wide and 16 ft. 6 in. high, and is designed for very large-scale production. It has a total output of thousands of square feet of chemically polished and anodised aluminium per day, for the motor and other industries.

The provision of this installation emphasises the plant interests of Albright, which lie in electroplating as well as in chemical polishing. In both these fields Albright processes are already well established.

U.K./Argentina agreement on ossein gelatine

● AN AGREEMENT has been concluded between **P. Leiner and Sons Ltd.**, Treforest, and **Stauffer Argentina S.A.I.C.**, Buenos Aires, under which Leiner will supply know-how to Stauffer for the production of ossein gelatine in the Argentina.

A plant is already under construction at Buenos Aires and production is expected to begin in January 1962. Orders for crushers and centrifuges have already been placed in the U.K. although no details are as yet available.

Under the agreement Leiner will also provide Stauffer with the complete details and design of their bone degreasing process in return for the supply of degreased crushed bone.

Indian Terylene plant will use I.C.I. licence

● A TERYLENE plant will be part of a complex to be built at Thama, near Bombay, involving a total investment of approximately Rs.50 million. A factory site is at present being acquired. The Terylene plant will be operated by a company called **Chemical and Fibres of India Ltd.**, who are licensed to produce I.C.I. polyester fibre. The capacity of the plant, which is expected to come into production in 1964, will be 4.5 million lb. a year. Full development of the site will be phased over a number of years.

£50,000 extension to plastics pipe factory

● PLANNING permission for a £50,000 extension to their thermoplastic pipe and fittings factory at West Drayton, Middlesex, has been granted to **Durapipe and Fittings Ltd.** The extension, enabling a four-fold increase in output of moulded pipe fittings, is due for completion by the end of March 1962.

This year, the company, one of the Incedon and Lamberts group, installed a number of new moulding machines to help cope with the rapidly growing demand for its fittings from both the home market and overseas. More plant is on order.

New basic research labs. for Miles

THE furnishing and equipping of new laboratories for Miles Laboratories Ltd., Stoke Court, Stoke Poges, Bucks, has recently been completed by Scientific Installations Ltd., laboratory design consultants, in collaboration with Mr. C. B. M. Smith, architect for the entire project.

The laboratories are to be used for a large basic research programme to supplement the extensive research carried out by Miles Laboratories Inc. in the U.S. They provide facilities for fundamental work in chemistry, biochemistry and pharmacology.

Main aim is the development of new and improved diagnostic tests for the detection of diseases and the development of new therapeutic agents. In addition to general laboratory accommodation the

facilities include dark room, cold room, chromatography laboratory, temperature-controlled air-cleansed special equipment and balance rooms, and a laboratory for high pressure hydrogenation.

Among the interesting features in the laboratory is the use of disinfectant at 60°C, for sterilising animal cages, which obviates the need for the usual large gas or electric autoclaves, and the introduction of accelerated input air to the fume cupboards to reduce heat loss from the laboratory. In addition the multiple vacuum outlet system is provided by recirculated high pressure water which was found to be the most economical method of achieving the degree of vacuum required while at the same time avoiding heavy water wastage.



View of one of the new laboratories

แผนกห้องสมุด กรมวิทยาศาสตร์

กระทรวงอุตสาหกรรม



★ LAST week I wrote about a farmer, an engineer and an economist who had achieved distinction in spheres far removed from chemistry before reaching the top ranks of chemical companies. This week it is the turn of the scientists.

Sir Alan Wilson and Mr. C. F. Kearton, who next summer become respectively chairman and a deputy chairman of Courtaulds have much in common. Both worked on the war-time development of atomic energy; both have since the war won the highest British scientific award—fellowship of the Royal Society.

Lord Fleck was elected an F.R.S. while chairman of I.C.I. and Dr. Ronald Holroyd, a present-day deputy chairman, is also an F.R.S. For the chairman and deputy chairman both to be Fellows of the R.S. must surely be quite unique.

★ ON p. 925 is an article on the U.S. glycerine industry. In the U.K. the situation is very different since no synthetic glycerine is produced.

Glycerine in the U.K. is produced by two companies, Unilever Ltd. and Armour Hess Chemicals Ltd., although Armour Hess produce very little. Production in 1960 amounted to 32,500 tons of 80% crude. No estimates for future production are available.

End-use distribution in the U.K., appears to be stable. The latest available estimate, excluding explosives, of a few years back is as follows:

Pharmaceuticals	...	...	10
Resins	...	...	23
Paper	...	...	20
Toilet preparations			
and toothpaste			15
Foodstuffs	...	...	11
Miscellaneous and export			21

The pattern is not thought to have altered significantly since. Use in toothpaste and foodstuffs has increased but there has been some fall away in paper and pharmaceuticals.

★ A JOINT committee of the Plastics Institute and the British Plastics Federation has been set up to organise a number of events in connection with a Centenary of Plastics 1862-1962. It has been decided to celebrate the centenary in 1962 because it was at the International Exhibition in London in 1862 that Alexander Parkes, patentee and exhibitor of Birmingham, showed for the first time to the public 'a new material and manufacture which from its valuable

properties had induced the inventor to patent the discovery in England and France and to devote his attention for the last 10 years to the development of the capabilities and application of this beautiful substance to the Arts'. In the case shown at the exhibition were a few illustrations of the numerous purposes for which, according to its inventor, Parkesine might be applied. These included medallions, salvers, hollow ware, tubes, buttons, combs, knife handles, pierced and fret work, inlaid work, bookbinding, card cases, boxes, pens, penholders, etc. Parkes received a prize medal for his exhibit.

It is true that Parkesine contained no camphor, an indispensable component of the later material celluloid and it is equally true that while Parkes mentioned camphor in his patent of 1865 he did not appreciate its unique properties. There can be no doubt, however, that 1862 saw for the first time the material which led directly to the modern form of celluloid.

The programme of events to be organised by the Joint Committee includes a banquet in the London Guildhall in June 1962, the preparation of historical records on tape and possibly on film, and the publication of various booklets, Press articles and publicity matter.

'Open days' in firms in the plastics industry will be another feature of the celebrations, while there will be special meetings and lectures throughout the centenary year culminating in Interplas 1963—the exhibition to be held at Olympia from 12-22 June.

★ FOR the industrial historian, the relationship between the geographical location of an industry and its prosperity presents an interesting study; this is particularly so in the north-west of England, where the existence of vast salt deposits provided the initial incentive for inorganic chemical industry but where, today, manufacturing operations based on petroleum feedstocks thrive equally with those based on salt, anhydrite, coal and other mineral deposits.

The range of chemical manufacture in the north-west was shown up well in an article by Dr. D. W. F. Hardie as part of a special survey of the North West by the *Financial Times*. After outlining the operations of I.C.I., Albright and Wilson, Laporte, Joseph Crosfield, Shell and numerous others in this region, Dr. Hardie concluded that the factors that made the North West an early scene of chemical manufacture persist today, greatly augmented by the establishment of petroleum refining in the area and the recent discovery that salt lies under

Cheshire in amount estimated to be 400,000 million tons greater than previously known reserves of this key raw material. Proof of the prospects for the North West lies in the fact that, since the war, chemical manufacturers established in the area have, almost without exception, extended and diversified their operations there, while outside chemical firms have acquired interests within it.

★ IT seems to be the way of the world that those people who are most vociferous in protests about this and that are often the last to come forward with any constructive suggestions. Thus it is with toxic chemicals used in agriculture; after all the hullabaloo that has been raised in the Press, in Parliament and elsewhere, one would have thought that there would be plenty of people with something useful to say on this matter. But, in their report just issued (see p. 918) the research study group set up to examine this matter record, simply and undramatically, that a press notice issued in April 1960, inviting information on the subject, drew a negligible response.

Rather more co-operation was forthcoming however, in response to direct approaches to chemical manufacturing and other bodies and individuals concerned with pesticides, without whose help the report would have been difficult to complete.

★ ITALIAN producers of mercury regard as imperative the abolition of the production tax which burdens their industry to the extent of some 300 million lire a year. As mentioned in this journal last week (p. 880) the Italian Chamber of Deputies has already approved this abolition and it is now being considered by the Senate.

The tax dates back to 1954 when there was a boom in demand for mercury. Prices were high and the Italian producers, Monte Amiata and Siele, were induced to exploit even poor deposits which normally it would not pay to mine. In the middle of 1955, however, prices began their downward trend, which continued into 1956. Producers were obliged to clip output and reduce their labour commitments. The tax became an unbearable burden and, in fact, the collecting of it was stopped in 1959.

The Italian producers complain, however, that this measure came too late, and that it would have helped more in the preceding years, when they were 're-dimensioning' their activities and striving, in vain, to prevent many of their regular customers from passing over to their competitors.

Alembic

I.C.I. CHAIRMAN WARNS ON POLYTHENE DUMPING

Address at Central Council meeting

IF the import of material at dumped prices goes on, manufacture of polythene in the U.K. will become so unprofitable that no one will invest more money in plant, and an increasing proportion of the country's requirements will be met by imports which will have to be paid for in dollars. So warned Mr. S. P. Chambers in his address to the meeting of the I.C.I. Central Council which took place at Blackpool on 17 November.

The existence of manufacturing capacity well in advance of current demand in some products—polythene and agricultural chemicals are among them—poses difficult problems even for the most efficient producer, because even if his own estimates of the increased capacity that would be required had been reasonable, the existence of excess capacity could quickly lead his competitors to adopt pricing policies which would make his business unprofitable.

Dumping is a possibility with any product for which the cost of raw materials plus that part of the cost of production which depends on output is small compared with the fixed costs which have to be borne whether the plant is fully or only partly occupied. When a manufacturer has covered his fixed costs by selling as much as he can at normal prices in his home market, it pays him to sell any extra he can make at any price higher than the cost of making that extra quantity, which is very much lower than his or any other producer's total production costs.

Excess capacity

In the case of polythene, the excess capacity that exists in the U.S. is several times as big as the total market in Britain and, because the duty on imports into the U.K. is only 10%, I.C.I. and other manufacturers in Britain, who are just as efficient as American producers, are placed in an impossible position, said Mr. Chambers. The U.K. has been singled out for attack because all the other producing countries have a higher import duty, and the U.K. are unable to retaliate because the duty on imports into the U.S. is 47%.

"Fair competition we can meet at home and abroad," continued Mr. Chambers. "and, although the going will undoubtedly be more difficult for some time than it has been in recent years, I am confident that if we in I.C.I. can keep down our costs and still further improve our efficiency we shall see our turnover increasing again."

In his address, Mr. Chambers also re-

ferred to the trading results of the first half of 1961. The fall in profits was in line with the experience of most companies, and the check in I.C.I.'s progress arose partly from the U.K.'s present economic situation. He observed that whenever consumption in the U.K. has been allowed to rise, imports have risen faster than exports and, with the smallness of the countries reserves, measures have to be adopted to restrict the demand for goods at home. The use of such measures, unfortunately, restricted production over a wide range of industries and added to total manufacturing cost per unit of output, thus reducing even

further industry's ability to compete in world markets. Until steps were taken to correct the underlying weaknesses in the economy, there was no alternative once a crisis was upon us. The right action was bound to include measures that would make it harder for inefficient businesses or inefficient sections of industry to go on making profits in a protected home market, and harder for all businesses to pass on increases in wages and other costs to their customers.

"If action is taken to combat inflation," he said, "and to make British industry as a whole more competitive, then this country will overcome its difficulties and the result will be a surge forward in productivity, in exports, and in living standards. Businesses which are efficient and alive to the need to adapt themselves to changing conditions, to develop new products and to seek out new markets have little to fear from such conditions in the long run, but the immediate outlook for British industry is undoubtedly more difficult trading conditions at home and greater dependence on export markets where selling costs are higher and profits are lower and harder to earn."

Accident shows need to check acid tankers

THE vital necessity of examining rail tankers when they are filled with acids or other dangerous liquids, to make sure that all valves are in good condition and ready for use at the delivery end, is emphasised by an accident which occurred in a metal works where two men were attempting to transfer acid from a rail tanker into fixed storage tanks. Normal procedure was to use a gravity feed pipe connected to the discharge manifold at the base of the tanker. On this occasion the usual tanker had been replaced by another, unfamiliar one.

Finding that they could not operate the discharge cock, the men decided to try another cock on the other side of the tanker. The hose was not long enough and, while waiting for another to be fetched, they started removing the blanking off flange, ready for fitting the hose. As soon as the seal was broken sulphuric acid spurted out all around the flange and the men were badly slashed. But for prompt action by another worker, who wore protective clothing, one of the men might well have sustained fatal injuries.

The foregoing incident is described in *Accidents* (H.M.S.O., 1s 3d) compiled by H.M. Factory Inspectorate, in which it is urged that the open and closed positions of valves on tankers be clearly indicated, preferably in distinctive colours. Contents should also be clearly labelled and the labelling recommendations of the A.B.C.M. should be followed closely.

Another accident described was in a chemical works where a shot-blaster was gassed when the compressed air breathing apparatus he was wearing was inadvertently connected to a nitrogen supply line. This was due to the neglect of a works rule and to the lack of a colour code

for piped services.

Yet another accident occurred when two men were cleaning a machine which was used for the mixing and blending of powdered materials. One man accidentally knocked the starter button while the second man was cleaning the beater arms, with the result that the machine started up and injured the second man. This case shows the vital importance of isolating a machine effectively from the source of supply.

Minister warns drug manufacturers

DRUG manufacturers were warned in the House of Commons that they must be frank in supplying information to the Public Accounts Committee, Sir Edward Boyle, Financial Secretary, said that neither the Treasury nor the Ministry of Health were going to drop questions on costs and profit conditions. Some specific queries have been put to the companies on the costs incurred in advertising. At the same time M.P.'s were reminded of the industry's need for research.

The best approach for drug firms, thought the Minister, lay in direct negotiations on prices of widely used drugs. The Government modifications to the voluntary prices regulation scheme provided for this direct negotiation.

Titanium price cut

Jessop-Saville are to cut the price of their titanium products, in most cases between 10 and 15%. Price reductions are attributed to increased output and further improvements in production techniques.

Ardeer silicone plant includes automatic control of chlorosilane distillation

CHLOROSILANE distillation and reaction processes at the Ardeer silicones plant of the I.C.I. Nobel Division is now being handled by automatic control equipment, including over 50 miniature pneumatic control and monitoring instruments by Honeywell Controls Ltd. This completes commissioning of the methyl chlorosilane reactor system and a multi-component distillation unit consisting of columns for either continuous or batch distillation.

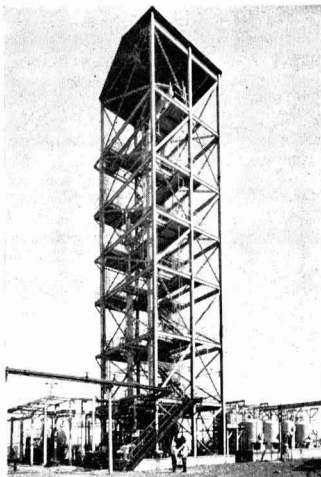
The panel-mounted instruments, housed in an air-purged control room for safety reasons, control and record such process variables as temperature, pressure and steam/process flow ratios. Conventional instruments, also by Honeywell, include a three-term controller which maintains reactor temperature very precisely by varying the corrective action in accordance with rate of temperature change away from control point.

Silicones are produced by combining methyl chloride with silicone powder at high temperature to give chlorosilanes. These are hydrolysed and distilled to a range of products with many and varied industrial uses. Instruments were made at the Newhouse, Lanarkshire, factory of Honeywell Controls.

The development of I.C.I.'s direct route from silica and silicates to organosilanes and thence to silicones was described at a meeting of the American Chemical Society earlier this year (CHEMICAL AGE, 20 May, p. 816).



Three-term Honeywell controller in the I.C.I. silicones plant. Precise reactor temperature control is achieved by varying corrective action in accordance with the rate of temperature change away from set point. Predetermined limits are shown here being set



Three new distillation columns, two continuous and one batch, in the I.C.I. silicones plant. These are in addition to the main distillation columns which, with reactors and associated plant, have now been equipped with an automatic control system by Honeywell

Refinery workers granted increase in wages

CLAIMS for substantial increases in wages for 60,000 workers in heavy chemicals, plastics and fertilisers were recently rejected by the Association of Chemical and Allied Employers. The association will shortly reply to a similar demand made on behalf of 25,000 workers in pharmaceuticals and fine chemicals. The association and the unions, who are not accepting the situation, are due to meet again towards the end of December.

In their separate pay negotiations, I.C.I. recently rejected claims for 62,000 workers, but as with the association, further negotiations are likely.

Recently, major oil companies have granted wage increases of 3d to 4d/hour to refinery workers. Workers at the Isle of Grain refinery of British Petroleum have had rises, although as yet no increases have been paid at the company's other U.K. refineries.

Shell also recently granted increases to its refinery workers which take into account an increase in productivity. Mobile have offered rises of 3d an hour to 400 process workers and 4d an hour to 200 craftsmen, the latter having been rejected.

£2 million oil terminal planned on Clydeside

The Clyde Navigation Trust has prepared plans for a £2 million oil terminal at Erskine Ferry, opposite the existing Esso terminal at Bowling. The Trust will provide all the facilities, while several of the major oil companies will co-operate by building their own storage and handling systems within the area.

D.C.L. engineers move

THE Engineering Division Headquarters of The Distillers Ltd., until recently at Devonshire House, Piccadilly, has now been transferred to a new building, Enford House, at 139-151 Marylebone Road, London N.W.1. Every provision has been made to combine efficient working conditions with economy of space. The partitioning of the rooms is faced with p.v.c. made by British Geon Ltd., a company in the Distillers Plastics Group.

With an area of some 30,000 sq. ft., the various departments are fully catered for, including planning, design, model making, photography and document reproduction.

I.C.I. chairman calls for end of fertiliser subsidy

At a Farmers' Club dinner this week, Mr. S. P. Chambers, chairman of I.C.I., said that he thought the fertiliser industry would be far healthier without any Government subsidy. He said that he was not against all subsidies to farmers, but there were certain subsidies which he felt merely helped to support the inefficient producer.

New aerosol packing factory opened

A NEW factory for aerosol filling has been opened by Bardro Aerosol Packing Co. Ltd., 2 Parkhurst Road, London N.7. Sited at Haverhill, Suffolk, the factory, which will have an annual throughput of several million units, is fitted with fully automatic aerosol filling lines. In addition, there are two semi-automatic filling lines for all standard containers from 2 to 36 oz. capacity. Completely separate lines are used for perfumery products, glass bottle aerosols and pharmaceuticals.

The company specialise in short and medium run production of aerosols. At present more than 40 different types of industrial products are being packed in addition to cosmetics and household products, etc. The company, together with their associates, Dudley Court Machine Co. Ltd., are undertaking research on the development of industrial and specialised aerosol products on behalf of clients.

A 100% extension to the factory is already planned; it is expected to be opened in June 1962.

LTC PROCESS HAS GREAT POTENTIALITIES FOR INDIA'S FUEL ECONOMY

A LOW temperature carbonisation pilot plant went into operation recently at the Central Fuel Research Institute, Jealgora (Bihar) for the production of smokeless domestic fuel from coal. The plant will provide valuable process data for designing commercial plants for domestic fuel in India.

Installed at a cost of £75,000, the plant has a capacity of 20-30 tons of coal per day. Built almost entirely from indigenous resources, the plant is a modification of the one developed by the D.S.I.R. Fuel Research Station. It can treat both caking and non-caking coals and is particularly suitable for sized high-ash middlings from coal washeries.

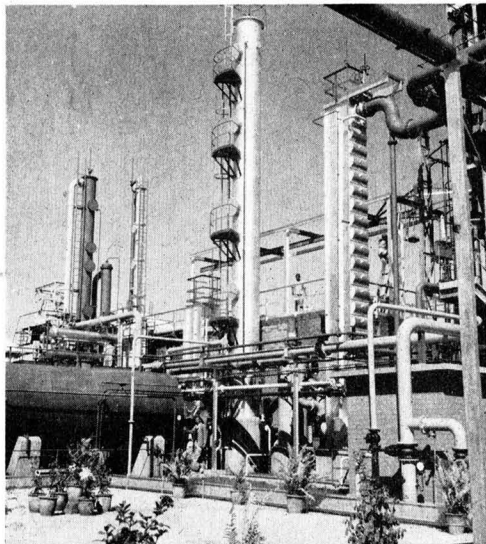
Besides the production of domestic coke, the plant can be used as a gas plant or for production of coke for low-shaft iron-making furnaces or for carbide manufacture. It consists of two continuous type narrow vertical retorts and is fully equipped for by-product recovery. The retort house and the gas holders have been fabricated and erected by Simon-Carves Ltd. while the by-product recovery units, including the cooling tower, have been fabricated by Carl Still of West Germany. The installation of a number of auxiliary units, preparation of the layout plan and preparation of the site have been carried out by the Engineering Division of the Central Fuel Research Institute.

The potentialities of the LTC process for India's fuel economy are great. Domestic soft coke requirements of urban population in the next 10-15 years are estimated at 35 million tons; demand from West Bengal and Bihar States alone is put at 2.5 million and 345,000 tons respectively. At present only 1.8 million tons of soft coke are produced in India by the open-stack method. A large number of cities of northern India can thus support LTC units of 1,000-1,500 tons of coal throughput producing 750-1,000 tons of smokeless fuel per day and 5-7.5 million cu. ft. of rich coal gas for use in manufacturing industries.

UF and PF bonding agents. Bonding agents based on urea-formaldehyde and phenol-formaldehyde resins for use in grinding wheels, sand paper and other articles are at present entirely imported into India. Current requirements of synthetic bonding agents are estimated at 150 tons a year; by 1965 the figure would rise by another 20%.

The Shri Ram Institute for Industrial Research has developed a process to produce modified UF and PF resins which produce bonding agents having improved strength properties and free from the drawbacks of those based on straight UF and PF resins.

By-product recovery unit of the LTC pilot plant, Central Fuel Research Institute, at Jealgora, Bihar



The process consists of making a phenol-formaldehyde or urea-formaldehyde precondensate with a predetermined methylol content and reacting it with a mixture of furfural and furfuryl alcohol either in the monomeric or semi-polymerised state. The reaction is arrested at the appropriate stage to obtain the re-

free of sulphate and chloride ions. The moist cake is then dried in a tray drier at 120°C and powdered in a pulveriser.

Pectin and tartrates. Recoveries of up to 3% of pectin. 12-13% of tartrates and 25-30% of invert sugars have been obtained from tamarind fruit pulp by a process developed on a semi-pilot plant scale at the Central Food Technological Research Institute, Mysore. Tartrates are not made in India at present.

About 300,000 tons of tamarind pulp are available in India annually. The pulp contains 12-15% tartaric acid and 2.5-3% pectin. The process developed (Indian Patent Application 52167) is available for licensing from National Research Development Corp., Lytton Rd., New Delhi.

Licences Developed. Fifty new licences for exploitation of new products and processes were granted by the National Research Development Corporation during 1960-61. These included the production of sodium carboxymethyl cellulose, pine oil, 4-hydroxy coumarin and its derivatives, hexyl resorcinol, and diethyl stilbestrol. The Corporation has now a total of 350 effective inventions available for licensing.

The Corporation sanctioned four new developmental projects during the year: (1) a prototype plant for production of high grade activated carbon, Hyskol 'X' at an estimated cost of £45,000 at the Regional Research Laboratory, Hyderabad, (2) a prototype plant for integrated production of proteins and oil from groundnuts at an estimated cost of £110,000 at Central Food Technological Research Institute, Mysore, (3) a unit for experimental production of aromatic chemicals at a cost of £42,000 at the National Chemical Laboratory, Poona, and (4) a pilot plant for the production of *p*- and *m*-cymenes at a cost of £2,200 at the Shri Ram Institute for Industrial Research, Delhi. In addition, a further grant of £23,000 was sanctioned for the project on the de-ionisation of cane juice in progress at the National Sugar Institute, Kanpur.

- Low-temperature carbonisation pilot plant at Jealgora can produce smokeless fuels, coke or carbide
- Shri Ram Institute has developed a process to produce modified urea-formaldehyde and phenol-formaldehyde resins
- A new process produces light basic magnesium carbonate from sea bitterns with a 35% cost saving

quired viscosity and reactivity. The viscous resins so obtained can be used for making abrasive articles.

Magnesium carbonate. The Central Salt Research Institute, Bhavnagar (Gujarat) has developed a process for producing light basic magnesium carbonate from sea bitterns. The process is economical, the cost of the product being at least 35% lower than the present Indian market price of £90 per ton. Current Indian production of the chemical meets only a fraction of the demand estimated at 2,000 tons a year.

In the process developed at the Institute, marine bittern is filtered, diluted and warmed in a reaction vessel fitted with a mechanical stirrer and heating coils. The liquid is agitated by bubbling air under pressure and a calculated quantity of soda ash solution is added gradually to it. When precipitation is complete, the material is filtered through a horizontal vacuum filter or a rotary vacuum filter and the precipitate washed

Planned capacities for Japanese petrochemicals

PRESENT petrochemical capacity (in tonnes) in Japan and the capacity expected to be in operation by the end of 1962 are given in the following table. In some cases the planned capacity for 1962 may be slightly reduced to keep in line with the Government's policy of controlled facility investments. However, no big deficit is expected since a number of technical agreements are still being approved. The 1962 figures for styrene monomer, polythene, ethylene oxide and ethylene glycol are based on estimates made by the Petrochemical Industries Association. Other figures for 1961 and 1962 are those of capacities for which technical agreements have been approved.

	1961	1962
Sumitomo Chemical	55,000	55,000
Mitsui Petrochemical	80,000	80,000
Nippon Petrochemical	40,000	50,000
Mitsubishi Petrochemical	82,000	82,000
Tonen Petrochemical	40,000	40,000
Maruzen Chemical	—	44,000
Daikyo Petrochemical	—	41,300
Total	297,000	392,300

Polythene		
Sumitomo Chemical	50,000	50,000
Mitsui Petrochemical	21,600	26,400
Mitsubishi Petrochemical	50,000	50,000
Showa Petrochemical	10,000	10,000
Furukawa Chemical	9,000	9,000
Nitto Unicar	—	27,000
Mitsui Polychemical	—	24,500
Total	140,600	196,900

Ethylene oxide		
Mitsui Petrochemical	12,000	18,000
Nippon Shokubai Kagaku	10,000	20,000
Mitsubishi Petrochemical	6,000	18,000
Total	28,000	56,000

Ethylene glycol		
Mitsui Petrochemical	9,600	14,400
Nippon Shokubai Kagaku	7,200	14,400
Mitsubishi Petrochemical	5,000	14,000
Total	21,800	42,800

Styrene monomer		
Asahi-Dow	36,000	40,000
Mitsubishi Monsanto	33,000	43,000
Kokan Chemical	13,000	26,000
Total	82,000	109,000

Polystyrene		
Asahi-Dow	20,800	28,000
Mitsubishi Monsanto	16,800	27,000
Kokan Chemical	7,900	16,000
Total	44,600	71,000

Propylene glycol		
Mitsui Chemical	1,200	1,200
Showa Denko	3,600	3,600
Asahi Electrochemical	2,000	2,000
Total	6,800	6,800

Isopropanol		
Nippon Petrochemical	10,000	10,000

Acetone		
Nippon Petrochemical	10,500	10,500
Mitsui Petrochemical	7,000	21,000
Total	17,500	31,500

Methyl ethyl ketone		
Maruzen Oil	7,150	7,150

Butanol		
Maruzen Oil	8,800	8,800
Mitsubishi Chemical	1,680	1,680
Tonen Petrochemical	—	3,800
Daikyo Petrochemical	—	25,000
Dainippon Chemical	—	9,600
Total	10,480	48,880

Octanol		
Mitsubishi Chemical	6,000	6,000
Tonen Chemical	—	6,000
Daikyo Petrochemical	—	6,000
Shin Nippon Chisso	—	10,000
Total	6,000	28,000

Butadiene		
Nippon Petrochemical	8,300	8,300
Nippon Synthetic Rubber	38,500	45,000
Tonen Petrochemical	7,200	7,200
Total	54,000	60,500

Synthetic Rubber		
Japanese Geon	30,000	30,000
Nippon Synthetic Rubber	57,000	79,000
Total	87,000	109,000

Benzene		
Maruzen Oil	6,600	6,600
Mitsui Petrochemical	12,000	12,000
Mitsubishi Oil	3,600	3,600
Mitsubishi Petrochemical	13,000	13,000
Nippon Petrochemical	16,300	17,700
Sumitomo Chemical	—	11,000
Total	51,500	63,900

Toluene		
Maruzen Oil	26,600	26,600
Mitsui Petrochemical	14,400	14,400
Mitsubishi Petrochemical	14,000	14,000
Mitsubishi Oil	12,000	12,000
Nippon Petrochemical	9,100	11,500
Sumitomo Chemical	—	5,300
Total	76,100	83,800

Xylene		
Maruzen Oil	25,100	25,100
Mitsui Petrochemical	12,000	12,000
Mitsubishi Oil	6,000	6,000

Xylene (cont'd.)		
Nippon Petrochemical	3,800	4,200
Sumitomo Chemical	—	2,000
Total	46,900	49,300

Terephthalic acid		
Mitsui Petrochemical	21,600	28,800
Maruzen Oil	15,500	23,250
Total	37,100	52,050

Phenol		
Mitsui Petrochemical	12,000	36,000

Alkylphenol		
Maruzen Oil	1,870	1,870
Mitsui Chemical	1,200	1,200
Sanyo Oil and Fat	1,680	1,680
Total	4,750	4,750

Acetaldehyde		
Mitsui Petrochemical	—	24,000
Shin Nippon Chisso	—	31,500
Showa Denko	—	24,000
Daikyo Petrochemical	—	61,500
Total	—	141,000

Alkylbenzene		
Sumitomo Chemical	—	15,000
Mitsubishi Petrochemical	—	15,000
Nisseki Senzai	15,000	15,000
Nitto Chemical	—	12,000
Total	15,000	57,000

Acrylonitrile		
Sumitomo Chemical	12,000	12,000
Mitsubishi Chemical	—	7,200
Asahi Chemical	5,400	5,400
Ittso Chemical	—	7,200
Total	17,400	31,800

Epoxide resins		
Mitsubishi Petrochemical	2,000	4,000

Polybutene		
Furukawa Chemical	2,100	2,100
Shin Nippon Chisso	—	5,000
Total	2,100	7,100

Polypropylene		
Sumitomo Chemical	—	10,000
Mitsubishi Petrochemical	—	10,000
Mitsui Chemical	—	10,000
Shin Nippon Chisso	—	13,000
Total	—	43,000

(Source: Japan Chemical Week)

Honeywell open new automatic control factory at Hemel Hempstead

A NEW 32,000 sq. ft. factory devoted entirely to producing 'made to order' automatic control systems has started production at Hemel Hempstead, Herts.

The factory, occupied by Honeywell Controls Ltd., will make, among other items, units for scanning and logging data for industrial operations, controls for industrial processes, parts for full-size Honeywell electronic computers. Honeywell's large Newhouse (Scotland) plant already mass-produces individual controls and the Hemel plant will combine these components into prefabricated tested systems.

Opening of the new Hemel Hempstead unit is one of the first events in the celebration of Honeywell's 25th year as a British company. They have become prominent suppliers of automatic control instruments for United Kingdom industry, having a factory in London as well as the Newhouse factory. Nearly half the company's production is exported. Plans are already in being for extending the factory space at Hemel Hempstead to 120,000 sq. ft. in the next few years.

Honeywell Controls' managing director, Mr. C. W. Spangle, states that the

most important development in the next 25 years will be in the marriage of automatic process control to the electronic handling of data. This will make it possible to close the loop between business management and process technology, to enable a plant to operate at its maximum efficiency for any given raw materials or workload. Commenting on the vital role of instrumentation in the chemical and petroleum industries, Mr. Spangle points out that instrumentation sometimes costs them up to 13% of their capital outlay.

New F.B.I. register lists 8,000 U.K. firms

LATEST edition of the 'F.B.I. Register of British Manufacturers', published by the Federation of British Industries, 21 Tottenham Street, London W.1, represents more than 8,000 member-firms. Their names, addresses and branch of industry are listed, while their products are classified under 5,500 different headings.

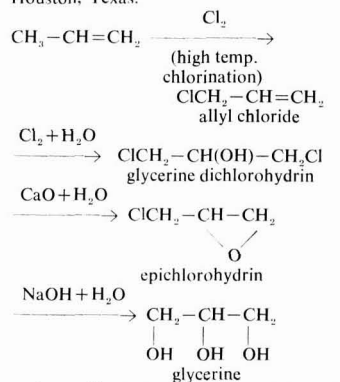
Lists of brands, trade names and trade marks are also included. Language glossaries in French, German and Spanish assist foreign buyers to identify the products in which they are interested.

GLYCERINE IN THE U.S.

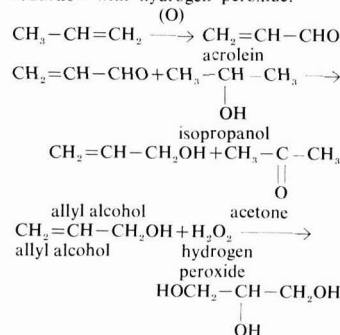
Three processes developed in 1961 but new capacity brings problems

FROM a technology point of view, 1961 has been a red letter year for synthetic glycerine. During this year, the list of commercial manufacturing routes grew from one to four in the U.S., as one new process came on stream at Shell's Norco, La., plant and two other new routes were announced for plant construction by Atlas Chemical Co. and Olin Mathieson Co. respectively.

Synthetic glycerine has been commercially available since 1949 when Shell began operation of a process which involves the formation of allyl chloride and propylene epichlorohydrin as intermediates, and which has since dominated the scene. This route is the basis for Shell's unit at Deer Park, Texas, presently rated at 110 million lb. a year, and Dow's 70 million lb. a year plant at Houston, Texas.

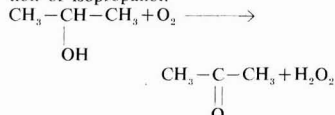


A wholly different route is taken at Shell's new production unit at Norco, La., a plant estimated to have an annual capacity of 40-50 million lb. glycerine. Here, propylene is air oxidized, over copper-based catalyst, to acrolein. The product is reduced to allyl alcohol which is then converted to glycerine by direct reduction with hydrogen peroxide:

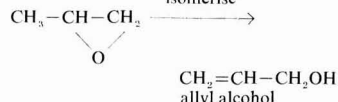


Considerable by-product acetone is obtained in the process. Part of this is

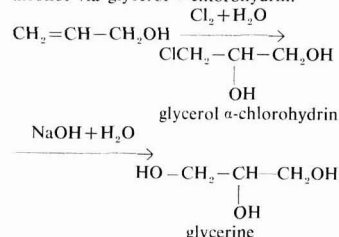
formed in the course of reduction of acrolein to allyl alcohol. In the case of Shell's plant, a second related source of acetone is the generation of hydrogen peroxide which is obtained by air oxidation of isopropanol:



At Olin Mathieson's newly announced 40 million lb. a year plant, the feedstock will be propylene oxide, itself obtained by chlorohydrination of propylene followed by hydrolysis in the presence of lime. First step in the synthesis is the isomerisation of acrolein to allyl alcohol:



The route by which Olin-Mathieson will convert allyl alcohol to glycerine is not known, but there are two obvious possibilities. One is the direct reaction with hydrogen peroxide, as shown above, but more likely is the conversion of allyl alcohol via glycerol α -chlorohydrin:



A completely different approach will be taken by Atlas Chemical Co. at its new glycerine plant now under construction. Here, the raw material will be molasses (other carbohydrate raw materials may be used at a later date). The synthesis involves a hydrogenolysis of the carbohydrate stock to yield a mixture of glycerine and glycols. Main products of the initial production unit will be glycerine (30 million lb. a year at capacity), ethylene glycol (10 million lb.) and propylene glycol (10 million lb.).

Glycerine markets

Altogether, these sources of synthetic glycerine constitute a capacity of 290-300 million lb. a year. This is superimposed on the output of glycerine obtained as by-product from soap, fat-splitting and fatty alcohols. These sources account for some 160 million lb. a year of 'natural' glycerine in the U.S. Limitation is not in capacity but in raw mater-

ials supply, as soap production continues to decline in the face of still-growing inroads made by synthetic detergents. Thus, one recent study forecasts U.S. availability of by-product glycerine at only 120 million lb. in 1965.

On the consumption side, the outlook is not too favourable and serious problems are raised by the present influx of new capacity. U.S. consumption of glycerine was 278 million lb. in 1960 is expected to reach 295-300 million lb. by 1965. End use distribution is estimated as follows:

	1960 (%)	1965
Alkyd resins	23.3	22.7
Cellophane	17.6	18.6
Pharmaceuticals and cosmetics	16.5	19.7
Tobacco	14.0	15.9
Foods and beverages	7.9	9.2
Explosives	5.8	5.1
Miscellaneous and exports	14.9	8.8

Basically, the problem in glycerine's moderate demand outlook is that it is mainly tied to relatively slow-growing segments of the economy. Alkyd resins in surface coatings, the largest consumer, are hard-pressed to meet the competition of latex formulation resins (styrene-butadiene, polyvinyl acetate, acrylics), and of epoxies. Furthermore, within the family of alkyds glycerine must compete with other polyhydric alcohols, notably sorbitol and pentaerythritol.

Cellophane, now the second largest consumer of glycerine, also shows poor prospects for growth, as newer plastic films, notably polyvinyl chloride, polythene, and polypropylene are assuming a rapidly increasing share of the packaging film market.

The picture looks far brighter in the production of tobacco (where glycerine is a humectant) and in the production of cosmetics and drugs. Together, these two areas may bring a market increase of 10-15 million lb. glycerine during 1960-5.

More promising is the outlook for co-products of glycerine manufacture. This is especially true of epichlorohydrin, formed in the original synthetic glycerine process practised by Shell at Deer Park and by Dow. Epichlorohydrin is a main raw material in the production of fast-growing epoxy resins.

Each of the other manufacturers has very specific reasons for adding to the already overbuilt glycerine capacity. Shell's Norco plant provides a broad production base for acrolein, a highly reactive aldehyde which seeks new markets. Olin-Mathieson's process provides an outlet for propylene oxide, thus offers a means for utilising chlorohydrination facilities which were originally built for ethylene oxide production, but which are being idled as Olin-Mathieson switches to direct oxidation of ethylene.

Finally, Atlas Chemical finds glycerol and co-product glycols a useful addition to its line of polyhydric alcohols (notably sorbitol). At present, the company reports a captive use for 5 million lb. a year glycerine, expects to sell most of the remaining output.

How surfactants affect systemic pesticides and herbicides

DURING the hot, dry summer of 1959, a number of new systemic insecticides were field tried against sugar beet aphids. Among these were certain compositions containing fluoroacetamide, FCH_2CONH_2 , a simple water-soluble compound of low molecular weight (77) shown to be relatively non-toxic to mammals and to be a powerful systemic aphicide, particularly in the presence of certain wetting agents.

The first formulations of the new aphicide were made using sodium alkyl sulphosuccinates as the wetting agent; results were very variable and in many cases, particularly when the spraying was done in hot sunlight and/or at low volumes (20-30 gall. per acre) no aphid kills at all were observed or the speed of kill was very slow and incomplete.

Towards the middle and end of the season, changes in formulation were made and Lissopol was substituted as the wetter in place of the sulphosuccinate in accordance with the original formulation suggested as a result of the 1958 limited field trials.

The effect of changing back to Lissopol from sulphosuccinate as the wetter was immediate towards the middle of the 1959 season; the spray volume had been increased to 60 gall. per acre on the advice of the British Sugar Corporation specialists and of the experts at the Dunholme out-station of the Rothamstead Research.

Aphid kills were rapid enough and, on check fields, the results obtained in terms of virus yellow control of sugar beet were equal to those from the hitherto best known organo-phosphorus systemic insecticides, all of which were formulated using non-ionic wetters similar in chemical constitution to Lissopol.

I.C.I. and Shell products

Lissopol is made by I.C.I. and is a condensation product of an alkyl phenol and polyethylene oxide; Nonidet is a similar product from Shell and there is no reason to suppose that it is in any way inferior to Lissopol in these systemic insecticide formulations; the Bayer product Metasystox is believed to be formulated with a very similar non-ionic wetter, *benzoyl p-oxydiphenyl ether polyethylene oxide condensate*.

It is probable that the hot dry 1959 season aggravated the differences between the efficacy of fluoroacetamide systemics using sulphosuccinate and Lissopol and was responsible for calling attention to this in a dramatic fashion. The same story can be told of fluoroacetamide compositions containing Lissopol as wetter used for control of aphids of brassica in the Evesham area where highly satisfactory results have been obtained during 1959 and 1960.

It thus seems that, for effective systemic action, a penetrating surfactant

is essential; conferences with Long Ashton scientists who have used sulphosuccinates with great success has revealed that they were solely concerned with spreading and covering action of foliage etc., using, for example, copper materials (oxychloride etc.) and benzene hexachloride or DDT.

**By Research Staff,
Pesticides and
Agricultural Developments
Ltd.**

Up to that time they had not, it appeared, been concerned with systemic action or penetration. Later, at the 1958 Brighton conference of the British Weed Control Council, it was stated by Stubbs that the first tests of the then new I.C.I. systemic herbicide, Reglon 1,1'-ethylene 2,2' dipyridylum dibromide, needed a non-ionic wetter for effectiveness and that, further, like the first sugar beet spray tests in 1958,

spraying in rainy weather did not diminish the effectiveness—the term 'rain-fast' material was used to describe Reglon.

Two years later, Leasure, of Dow Chemical, Michigan reported to the conference that Dalapon, a systemic selective herbicide, was very much more effective against quack-grass (*Agropyron repens* (L) Beauv) when a non-ionic wetter such as Tergitol TMN (Union Carbide) was used in the formulation than when Du Pont Duponal WA flake, an anionic surfactant was used.

Work done by Janse and Shaw of the U.S. Department of Agriculture (see CHEMICAL AGE, 2 September, 1961, p. 327) which appears to support our own conclusion that non-ionic surfactants are needed for the penetrative action required with systemic insecticides and herbicides and that inferior results are obtained when anionic surfactants are employed as wetting agent.

In spite of the well established fact that surfactants are essential in agricultural formulations, albeit that the type and amount for the particular job has to be studied carefully, the impression gathered from some recent scientific and practical symposia and conferences is that this lesson has not yet sunk in sufficiently; this is an error of judgement that could never arise in other branches of the chemical industry such as, for example, the cosmetic industry.

American firms show increasing interest in chloride route to titanium oxide

INTEREST has been focused in recent months on new and modified processes to produce titanium oxide. The chloride route is used at Du Pont's New Johnsonville, Tenn., plant and possibly at their Edge Moor, Del., plant. It is based on the oxidation of titanium tetrachloride using oxygen or an oxygen-enriched air. Du Pont's patents are U.S. 2,559,638 and 2,670,275.

Other U.S. companies are also interested in this route. Godfrey Cabot Corporation (British Patent 707,389) have been working on a flame chloride process licensed from Fabrique de Produits Chimiques. National Lead Corporation are reported to be building a pilot plant that will use the chloride route.

Du Pont, who have carried out significant commercial development of the $TiCl_4$ process, are operating under licence from Pittsburgh Plate Glass, who are the pioneers.

Economics of the process are said to be good with a yield of approximately 95%. The end product is claimed to be finer and with better covering power than titanium oxide made by the sulphate route.

Success of the chloride process depends on an integrated operation—recycling the chlorine and economic production of the tetrachloride. It takes 2½ lb. of tetra-

chloride to make 1 lb. of dioxide. With the cost of oxygen and giving credit for chlorine by-product, the tetrachloride route uses materials worth 50 cents to make some 32 cents worth of product.

Traditional TiO_2 producers are thought to have fought shy of the chloride process because of the heavy capital investment already locked up in existing sulphate plants, particularly in the large sulphuric acid plants involved.

In Canada, Continental Titanium Corporation of Baie St. Paul, Que., will in their new 20 tons/day TiO_2 plant use the Soloducha process, which is said to cut down on acid requirements, as well as making possible the use of leaner ores (CHEMICAL AGE, 12 August, p. 226). The process (Canadian Patent 610,334) utilises pressure (about 300 p.s.i.) and temperatures of 492°F to dissolve the titanium from its ores and to control subsequent crystal formation during hydrolysis. This process could, it is claimed, cut production costs by 20 to 25%.

Laporte Titanium Ltd. earlier this year submitted an improved process for an Australian patent. This consisted of passing any tetrahalide vapour (except fluoride) with an excess of oxygen through a fluidised bed at 750 to 1,500°F. The tetrahalide is oxidised to the dioxide.

Overseas News

JAPANESE PROCESS PRODUCES ACETYLENE FROM PETRO-NAPHTHA

SUCCESSFUL pilot-scale operation of a process for the manufacture of acetylene and ethylene from petroleum naphtha is reported by the Japanese Technical Research Association of Polymer Raw Materials, who have carried out experiments for about a year using an 0.5 tonnes/day pilot plant erected at the Kawasaki factory of Chiyoda Chemical Engineering and Construction Co. A plant of 3 tonnes/day capacity is being constructed with a view to confirming scale-up possibilities. Present estimates are that the process can produce acetylene and ethylene at a cost of 70 yen and 40-45 yen per kg, respectively. •

The result of these experiments will be watched closely in conjunction with Sumitomo Chemical's recently completed 25,000 tonnes/year acetylene/ethylene plant which uses a process of S.B.A., Belgium.

Record plastics output for West Germany

The West German chemical industry association estimates that plastics production this year will be 50,000-70,000 tons higher than the 1 million tons mark, compared with last year's output of 982,000 tons. If these estimates are realised, it will be the first time that West German plastics output has topped the 1 million tons mark.

Big future seen for new Canadian laminate

A big potential for wall coverings, furniture and other interior decorating uses is foreseen for a new type of high-pressure plastics laminate—Formica V-100—that has resulted from work by a small Canadian research team at St. Jean, Quebec. Developed by Cyanamid of Canada, the laminate is stated to offer a new type of finish as well as price advantages over conventional laminates. It is produced by a new technique that results in a thinner and more flexible sheet than standard laminates.

Cyanamid project in Colombia

Cyanamid de Colombia, Colombian subsidiary of American Cyanamid, are to erect a chemical plant in Bogotá at a cost equivalent to some \$U.S.1 million. The project, which will be controlled by the Cyanamid International ceiling subsidiary, will concern the production of chemical products "in which a large share of local raw materials can be used". Among the country's main raw materials are mineral oil, which indicates that the plant could be petrochemical in nature.

Swedish firm looks for big turnover expansion

Svenska Salpeterverken, Koping, expect their £8.6 million expansion project referred to in 'Overseas News' of 25 November to raise turnover from Kr. 60 million to Kr. 100 million by 1965. Share capital is to be raised from Kr. 10 million Kr. 40 million.

Official capacities for the new project will be 30,000 tons of methanol, 30,000 tons of sulphuric acid and 10,000 tons of ammonium sulphate at Kvarnorp; and 50,000 tons of ammonia and 66,000 tons of nitric acid on the basis of imported oil at Koping. The entire project represents Sweden's second largest single investment in chemicals, next to the petrochemical project at Stenungsund on the West Coast.

Italian coumarone imports up

Italian imports of coumarone in 1960 are placed at 2,007 tonnes against only 1,433 tonnes in 1959. Some 41% of the 1960 imports came from West Germany and 32.5% from the U.S.

Italy's only producer at present is Cledca of Milan. Some 70% of the Italian-produced coumarone is used in the rubber industry and the rest in the production of paints, varnishes, etc.

Hold-up for Czech chemical projects

A continuing hold-up in construction of new plants has necessitated a revision of the 1962 development of the Czech chemical industry. A number of new production units will not come into operation as scheduled and it is intended that of the 1962 chemical industry production increase, only some 25% instead of more than 50% as previously planned, will come from new capacities. It will be the responsibility of the plants themselves to make up for losses in production increases foreseen under the country's third Five-Year Plan.

U.S.S.R. trims new capital investments

The U.S.S.R. is to undertake fewer new capital investment projects in 1962, since, in the past, the spreading of investment over too many projects has resulted in a slowing up process. This was revealed by Mr. A. S. Pavilov, a departmental head of State Economic Commission, 'Gosplan', in a radio broadcast.

However, he said, concentration of resources on enlarging or rebuilding plant already in existence, and on the completion of projects already begun, would mean that some R.29,000 million worth of plant—R.3,000 million more than this year—would be brought into operation in 1962. There would be heavy investment for the expansion of the chemical, iron and steel and engineering industries.

Phosphoric acid project in France

Phosphoric acid will be produced at Tonny-Charente, France, by a new company called Asturonica, to be formed jointly by the Belgian concern Compagnie Royale Asturienne des Mines, and l'Office National Industriel de l'Azote (O.N.I.A.) of France. The plant is scheduled to be started up in 1963.

Monsanto to extend Spanish plant with new units for plastics manufacture

Monsanto Ibérica have applied for authorisation to expand their plant at Monzón, in the Province of Huesca, Spain, where they manufacture calcium carbide, acetic acid, synthetic fibres, and other products. A new section will be added for the production of 21,000 tons of monovinyl chloride and 10,000 tons of polyvinyl chloride a year. Machinery worth 9½ million pesetas will be imported, in addition to 25 tons of activated carbon and 5 tons of activated alumina per year.

Sicilian fertiliser venture

The European Investments Bank is to lend \$1.6 million to a company (not yet named) which will mine potassium salts

in Sicily and produce chemical fertilisers. The potassium will be mined in an area where rocksalt and sulphur are already produced.

New fluorine toothpaste developed in Norway

A research team of the Norwegian Dental College in Oslo has developed a new solution of fluorine and tin named stannifluoride. Infrequent applications of the solution directly to the teeth give a more practical method of decreasing decay. One application every six months is said to be sufficient. The new solution is not the same as stannofluoride which has previously been tried in the U.S.

Overseas News

Ugine link with Italian firm in electrochemical venture

PRODUCTION of chemicals by Società Elettrochimica Ugine-Caffaro—a company just formed jointly by the Ugine chemical concern of France and the Italian company S.p.A. Caffaro—is to start in Italy next year. It is understood that the planned production programme will be given financial backing by a branch of the Milanese banking house Mediobanca and by the Lazard Frères bank of Paris.

Indian finishing plant for I.C.I. silicones

I.C.I. (India) are planning to set up a small unit at Sewri, Bombay, to manufacture silicone emulsions, using material imported from the I.C.I. Nobel Division's silicones plant at Ardeer, Stevenson. I.C.I. will supply know-how without royalty as well as equipment to the Indian company.

Sui pipeline extension

Work is expected to start in December on the extension of the Sui, Pakistan, natural gas pipeline from Multan to Rawalpindi and Islamabad via Lahore. It will take two years to lay the pipeline, which will supply gas for industrial and domestic use.

U.S.S.R. plan 6 million t.p.a. vacuum unit

The State Institute for the Design of Oil Refineries, Moscow, have prepared designs for an atmospheric vacuum distillation unit capable of handling 6 million tons of crude a year. The oil will be heated by a furnace which will produce 100 million cal./hr. and will be handled by centrifugal pumps capable of a throughput of up to 1,000 cu. m./hr. The project provides for a recycle of heat. The unit will be controlled electronically.

Turkish production falls

Figures now issued by the Organisation for European Economic Cooperation on the Turkish economy show that last year chemical production stood at an index figure of 156, taking 1950 output as 100. This 1960 figure compares with one of 164 for the previous year and of as much as 172 for 1957.

New paint and plastics plant in South Italy

A new plant for the production of paints has been completed by Manifattura Ceramica Pozzi at Sparanise, Province of Caserta, Italy. On an adjacent site, the company is now building

plant for the production of plastics materials, as well as facilities for the production of ceramic goods.

Brown coal-base chemical plant for Greece

A plant which will produce chemicals and plastics from a brown coal base is to be erected at Ptolemais in Greece at a cost of between \$10 million and \$12 million. The plant will use locally-mined brown coal. To be operated by a Greek group, the factory will produce mainly for export.

Soviet method for chemically hardening glass

A method for strengthening glass by chemical hardening has been developed by two U.S.S.R. scientists, S. N. Zhurkov and Professor F. F. Vitman. The method is based on the experiments of Academician A. F. Ioffe, which consisted in the removal of surface cracks with acid. Glass panes are hardened at high temperatures by a special liquid spray which forms a fog mantle around the pane and builds up the new surface upon condensation. Window panes treated in this

manner can withstand the impact of a 1.5 kg. steel ball falling from a height of 3 m. and are thus 6 to 7 times stronger than ordinary window glass. A highly resistant, smoked, burnt-in film is noted as another advantage of chemically hardened glass to be used for glare-absorbing windows. A new installation for the chemical treatment of glass is being built at the Plant Imeni Dzerzhinskiy in Gus'-Krustal'nyy; the technology of glass hardening is being developed at the Laboratory of Glass-Fibre Materials, State Scientific Research Institute of Glass.

Austria's chemical output up 100% in 12 years

According to the Austrian chemical industry association Gesellschaft für Chemiewirtschaft, Austrian chemical output for 1961 will be valued at more than Sch.10,000 million, an increase in production value of 100% since 1949, although the number of employees had risen by only 45% over the same period. Austrian plastics output is now running at a per-capita level of some 9kg per year.

Yugoslav chemical exports show expansion

Yugoslav chemical industry output over the first half of the current year was 108% of the first-half 1960 figure. During the first half of 1961 Yugoslavia exported some 52,610 tonnes of chemical products, worth 1,699 million dinars, and imported 359,130 tonnes, worth 9,738 million dinars.

U.S research work throws new light on alkyl radical reaction mechanism

THROUGH a series of experiments involving deuterated, low-carbon alkyl radicals, workers of the U.S. National Bureau of Standards have drawn the conclusions that these radicals have only one mode of decomposition below 500°C, and that hydrogen atoms do not migrate between the atoms of the radicals.

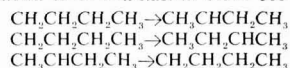
Such findings are in direct contrast to the results of experiments performed along classical lines. The development of free radical kinetics has depended upon the inferences drawn from experiments involving extremely complex systems. Under such conditions many different radicals may react with stable molecules or with each other. The results of such experiments are often difficult to interpret because of the multiplicity of possible reactants and end products. The techniques developed by the N.B.S., in which deuterated radicals are reacted in simple systems, permit unambiguous interpretation of results. Similar techniques can also be used to determine the purity of isotopically labelled compounds.

The experimental procedure adopted for the formation of alkyl radicals was to heat small proportions of pure, deuterated

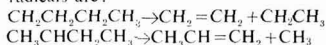
gases to temperature between 350° and 550°C. The gases were held at the desired temperature—and pressures between 70 and 100 mm.—for about five minutes, producing less than 1% conversion. After reaction, the gases were passed through cooled traps which froze out the remaining original gas. The uncondensed products were pumped to a mass spectrometer for analysis.

Both n-propyl radicals and butyl radicals were examined by this method. It was found that the decomposition of n-propyl below 500°C occurs almost exclusively through the release of CH₃. Also below 500°C, it was shown that isobutyl decomposes only by the expulsion of CH₃.

Using the same method, the following previously accepted reactions have been shown to be non-existent below 500°C:



The only reactions of importance involving decomposition of n- and sec-butyl radicals are:



● **Mr. S. Chapman, C.B.E.**, director of the Association of Chemical and Allied Employers, has been appointed to the Industrial Injuries Advisory Council for the new term which began on 30 November. The Council advises the Minister of Pensions and National Insurance on proposals for regulations and other matters relating to the National Insurance (Industrial Injuries) Act.

● The Physical Methods Group of the Society of Analytical Chemistry has elected the following officers for the forthcoming year: chairman, **Dr. W. Cule Davies, F.R.I.C.**; vice-chairman, **Mr. L. Brealey, F.R.I.C.**; hon. secretary and treasurer, **Dr. T. L. Parkinson, F.R.I.C.**

● **Mr. E. A. Hutchings, O.B.E.**, who has left the leather industry, has resigned from the chairmanship of the British Leather Manufacturers' Research Association. He is succeeded as chairman by **Mr. P. S. Briggs**, of T. N. and F. H. Briggs (Tanners) Ltd., Leicester.

● Evans Medical Ltd. announce that **Mr. B. Sparling** has been appointed managing director of Lofthouse and Saltmer Ltd., Hull, recently the subject of a successful takeover bid by the company. Mr. Sparling, 25 years with Evans Medical, has recently returned from West Africa where he was managing director of the Nigerian subsidiary company in Lagos and Aba.

● **Mr. Victor W. Slater** has retired as a director of Laporte Industries after 41 years with the group. He joined Laporte at Luton as a chemist in 1920 and was



V. W. Slater

appointed chief chemist there in 1941. In 1946 he joined the board of the parent company as chemical director and also served for various periods on the boards of Laporte Titanium, Laporte Acids, and James Wilkinson and Son.

● **Dr. Arthur Stoll**, vice-president of the Basle, Switzerland chemical company Sandoz AG, has been granted an honorary doctor's title by the University of Strasbourg in connection with his contribution to branches of biochemical research.

● **Sir Howard Florey**, professor of Pathology at Oxford, was re-elected president of the Royal Society at the anniversary meeting on 30 November. Other officers re-elected were: treasurer, **Lord Fleck, K.B.E.**; biological secretary, **Sir Lindor Brown, C.B.E.**; physical secretary, **Sir William Hodge**; foreign secretary, **Sir Patrick Linstead, C.B.E.** Other members of council include: **F. C. Bowden**, director of Rothamsted Experi-

PEOPLE in the news

mental Station, Harpenden; **Sir Christopher Ingold** (re-elected), emeritus professor of chemistry, University College, London; **Professor W. T. J. Morgan, C.B.E.**, professor of biochemistry, University College; **Dr. H. W. Thompson, C.B.E.**, reader in infra-red spectroscopy, Oxford.

● New appointments have been made by Bardro Aerosol Packing Co. Ltd. in connection with the opening of the new factory (see p. 922). **Mr. L. Posner** has been appointed sales director; **Mr. M. J. Bryant**, who will be in charge of the research and development programme, general manager, and **Mr. S. Strange** has joined the company as plant production manager.

● **Mr. Martin Lyth** has been appointed director of supplies to Griffin and George (Sales) Ltd. This is a new post created to meet the growing need for the buying and allied functions to be

represented at board level. Until his new appointment **Mr. Lyth** was managing director of Griffin and George (Scientific Instruments) Ltd., a subsidiary company which manufactures the Griffin specialist range of scientific instruments.

● **Mr. Charles E. Carter** and **Mr. William A. Graul** have been appointed associate directors of commercial development in the Petrochemicals Department of Gulf Oil Corporation, Pittsburgh, Pa. Mr. Carter will be in charge of projects being considered for commercialisation. Mr. Graul will be in charge of technical development of new petrochemical processes and products.

● **Mr. Cyril Bone** has been appointed to the board of Vinatex Ltd.—a wholly-owned subsidiary of Reichhold Chemicals Ltd. He has been the company's accountant and secretary since its formation in 1947. He will continue to act in these capacities.

● **Mr. Alan A. Meacock** has been appointed to the boards of Domestos Ltd. and their subsidiary companies. He will also shortly join the board of Pinoya Holdings Ltd., the parent company, acquired recently by Unilever Ltd. Mr. Meacock joined Unilever in 1949 and spent several years on the marketing side of the soaps and detergents business.

● **Dr. Charles L. Cutting, F.R.I.C.**, has been appointed to succeed **Dr. F. H. Banfield** early in the new year as director of research of the British Food Manufacturing Industries Research Association, Randalls Road, Leatherhead. Dr. Cutting joined the D.S.I.R. Torry Research Station in 1937 and had been officer-in-charge of their Humber Laboratory since 1952. Dr. Banfield is leaving to take up an appointment in the food industry.

Anti-corrosion service for industry

Industrial Services, of 138 High Street, Waltham Cross, Herts., have initiated an anti-corrosion service as a branch activity. The proprietor, **Mr. P. S. Muetzel**, a metallurgical chemist and corrosion engineer, has acted as a consultant for a number of years and in the course of this activity, most available anti-corrosives, paints, solutions and other treatments have been laboratory and field tested. New products are being tested all the time, and manufacturers are invited to submit samples of new materials. In addition to conventional methods of testing surface coatings, the company specialises in microscopical investigation and the evaluation of field test samples, where corrosive conditions are not accelerated, but lasting properties are estimated microscopically by viewing surfaces and sectional cuts.

Corrosion tests carried out over the past 10 years enable the company to recommend and supply the most suitable coating system for almost any application. Having also tested such other paints as anti-condensation paints, enamels and even emulsion paints Industrial Services have obtained distribution

rights of the approved items and are able to supply these at normal trade prices and discounts.

Institute of Information Scientists hold first exams

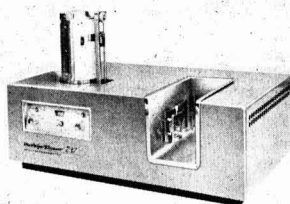
For the first time in the U.K., examinations are being held in scientific information work. Examinations for the Certificate of the Institute of Scientific Information Scientists are being arranged to follow the courses which are being held at the Northampton College of Advanced Technology, London.

Part I of the examination, which will take place at the College, St. John's Street, London E.C.1, on 18 and 19 December, consists of three papers covering sources of information, editing, methods of reproduction, presentation of technical information, abstracting, standards, patent law, and trade marks and design. Persons wishing to take the examinations should apply to the Hon. Secretary, Institute of Information Scientists, Torran, Crofton Road, Orpington, Kent, stating scientific subject field(s) in which they have mainly worked.

Equipment news and trends

CLAIMED to be the first low-cost **infrared spectrophotometer** to give, on a routine basis, high resolution spectra over the complete fundamental infrared region, the new Model 237 grating spectrophotometer covers a spectral range from 4,000 to 625 cm^{-1} with a linear frequency presentation.

Chief feature of the instrument is the incorporation of a new grating-filter



New infrared spectrophotometer

technology, the monochromator employing two gratings, used in their first order only. These are combined with a series of filters which automatically eliminate higher orders of radiation. Full coverage of the Model 237 is divided into two ranges: 4,000-1,250 and 2,000-625 cm^{-1} , either available to the analyst at the control of a panel switch. Two scanning rates, corresponding to 8 and 24 min. per range, can be selected by a second switch.

Perkin-Elmer Ltd., Beaconsfield, Bucks.

* * *

Comparative readings of a number of temperature points at a glance are possible using a new mercury-in-steel actuated **thermometer** which has a vertical scale, 7½ in. long and under 2 in. wide, in place of the normal dial. This allows as many instruments as are required to be placed side by side in a small space.

British Rototherm Co. Ltd., Merton Abbey, London S.W.19.

* * *

The Calmic **fluidised bed dryer** is intended mainly for the drying of granular material used in the pharmaceutical industry, but is thought to have applications in the chemical industry in processes where the atmospheric type of tray dryer is normally used.

For the 100 lb. batch loading produc-

tion model, drying cycles are in the order of 15-40 min., for most granular materials the drying temperature normally being in the range 40-80°C. It is stated that this size of dryer will do the work of between four and six two-truck atmospheric tray dryers thus, saving not only floor space, but also labour normally employed in loading and unloading trays.

Calmic Engineering Co. Ltd., Crewe Hall, Crewe, Cheshire.

* * *

A new **valve testing rig** has been brought into operation by a U.K. firm of valve manufacturers who are offering to carry out tests and analyses on behalf of other valve makers and users. The rig was designed to enable data on the performance of industrial valves to be determined accurately by fluid flow tests rather than by the generally accepted methods of theoretical assessment. Facilities are provided for the testing and recording of flow characteristics, pressure losses, volumetric discharge figures and other factors, for most types of industrial valves up to 6 in. bore.

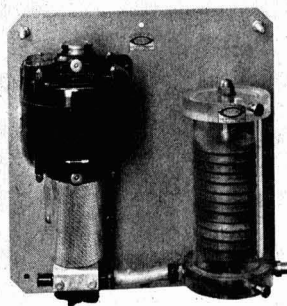
Newman Hender Group, Woodchester, Stroud, Glos.

* * *

An electric **automatic control system** giving very precise regulation of temperatures is sufficiently sensitive to correct a change of only half a microvolt, which represents a temperature deviation from set point of one-fortieth of a degree F. Industrial uses envisaged include the chemical and ceramics industries, notably for the production of glass and glass fibre.

There are three units to the system: a

PLATING SOLUTION FILTER



All particles down to 4/5 microns are removed from plating solutions by the unit shown, consisting of pump, motor and Perspex filter. Parts are of stainless steel and plastics with the filter body of Perspex, enabling the clarity of the solution to be seen at a glance. Capacity of the filter illustrated, which measures 18 in. by 15 in. by 8 in. deep and weighs about 30 lb., is 240 g.p.h. with pressure of 15 p.s.i. when clean and a filtration area of 200 sq. in. Makers: **Filtration and Valves Ltd., Roetan Trading Estate, Bromley Street, Lye, Worcs**

set point unit, deviation amplifier and 3-term control station. All units are transistorised and of modular construction. Each unit is available separately, and of particular interest is the design of the deviation amplifier, which is a four-stage differential type with a low internal noise level of 0.5 microvolt and common mode rejection greater than 10³. There is a high short-term stability with respect to ambient temperature and line voltage changes, long term stability within the error of the equipment employed to measure drift.

Honeywell Controls Ltd., Greenford, Middlesex.

* * *

A pneumatically operated automatic Reid vapour pressure recorder is claimed to produce substantial savings in time and labour as well as more accurate results than are obtainable by conventional methods. It is calibrated for vapour pressures from 2 to 18 p.s.i. and may be used for examining the volatility of different grades of petrol or, for example, the purity of methyl alcohol and other volatile liquids. There are two standard models, one for determinations from a single sample line, the other for sampling from two lines alternately.

Nash and Thompson Ltd., Hook Rise, Tolworth, Surrey.

* * *

New **protective gloves** for industry, trade name Chirco-Lon, are the first to be produced commercially from a nitrile rubber latex supplied by British Geon Ltd. The gloves are resistant to a wide range of greases, oils, solvents and acids and, in addition, say the makers, can be safely used with hydrocarbons. They also have good insulation properties and can be used for handling CO₂, for instance.

The Chichester Rubber Co. Ltd., Dunstable, Beds.

* * *

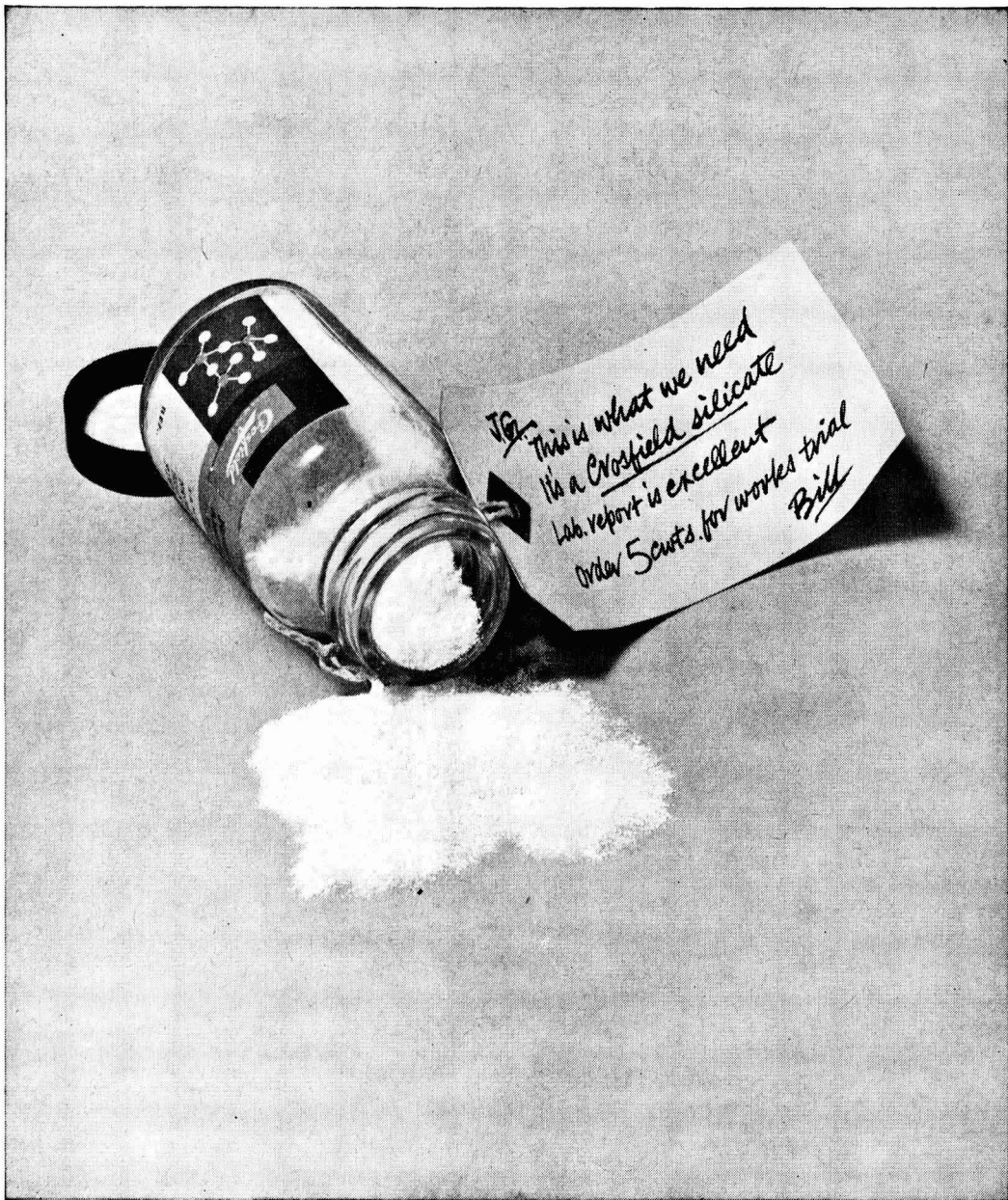
Compact variable transmission is provided by the RZG **variable gearing unit**, incorporating a 50 w. input shaded pole motor which can be wound to any voltage to suit 6-260 v. A.C. mains, together with a mechanical stepless drive. This has two output shafts, one providing a speed variation of 110-1,700 r.p.m. and the other offering one of five possible speed ranges between 3 and 235 r.p.m.

Jones and Stevens Ltd., P.O. Box 35, Eastern By-pass, Littlemore, Oxford.

* * *

Ultrasonic **sensing and switching system**, Sonac, has applications to conveyor systems and as a bin level indicator. Three major parts of the system are: a control unit containing a transistorised amplifier, a plug-in output relay and a power supply, and two hermetically sealed acoustic sensors. The relay operates the desired external function: light, buzzer, switch, etc.

Westool Ltd., St. Helen's Auckland, Co. Durham.



Have you considered using a silicate from the extensive Crosfield range? Whether you want to improve an existing product, develop a new one, save on material costs or simply solve a production problem, we may be able to help.

Crosfield silicates are already being widely used as extenders, reinforcing fillers, binding agents, deflocculators, suspending agents, adhesives and as desiccants in packaging.

Tell us your requirements and we'll send you a sample of the Crosfield silicate most suited to your specific job.

CROSFIELD MANUFACTURE SILICATES FOR INDUSTRIAL USES



Commercial News

Johnson Matthey

Interim dividend of Johnson Matthey and Co. Ltd. has been raised two points to 5%, as foreshadowed by the chairman in July when he said the board intended to declare a 5% interim to reduce the disparity between that and the final payment, provided that trading results for the period were comparable with those in recent years and that the outlook for those achieved in recent years and that the outlook for the remainder of the year appeared to justify an increase. The increase should not, it is added, be interpreted in any other sense.

Pinchin Johnson

Courtauld's subsidiary, Pinchin Johnson and Associates, have decided not to proceed with their proposed offer of 26s cash for the 5s ordinary shares of Paripan, the paint concern. The directors of Paripan, their families and associates, who hold more than half of the ordinary share capital, are not prepared to accept the offer in respect of their own holding. In a letter to Pinchin, the directors of Paripan say that they would be prepared to recommend the offer to other shareholders but would not accept themselves. Under these circumstances Pinchin Johnson have decided not to proceed with the matter.

Whesoe

Orders received by Whesoe Ltd. ensure a satisfactory volume of work, state the directors. Margins, however, are still low and it is anticipated that profits for the current year will be lower than those for the previous year. An interim of 5% (same) is declared.

Commercial Solvents

Commercial Solvents Corporation, U.S., have announced a quarterly dividend of 20 cents, bringing total dividend payment to 65 (50) cents. Simultaneously a stock dividend of 1% (2%) was announced.

D'Auby

The French concern Societe de Produits Chimiques D'Auby has announced a net profit of NF 3,046,240 for the 1960-61 financial year, compared with NF 1,980,383 for the previous year.

St. Gobain

St. Gobain have acquired a 25% interest in Grünzweig and Hartmann, a German manufacturer of insulating materials with a turnover of about DM180 million last year.

Norsk Hydro

The Norwegian chemical concern A/S Norsk Hydro reports for the financial year ended 30 June last a turnover of some 606 million Norwegian crowns, as

- Johnson Matthey interim up to 5%
- Lower profits forecast for Whesoe
- Norsk Hydro's 7% increase in turnover
- French plastics and rubber take-over

compared with only 562 million for the 1959-60 financial period. Dividend for the year is to be 9% (same). The company's net profit over the year under report was of some 21.2 million (1959/60, 20.6 million) N. crowns.

Eurac

The chemical and pharmaceutical industries remained over the past financial year those represented most strongly in the Eurac investment fund controlled by Kollektivanlagefonds AG, Zurich, although their share in the fund's combined holdings fell from 17.4% to 16.8%. The surplus of SF1,802,129 (SF1,782,699) will be distributed by a dividend per share of SF5.92 (SF5.82). The Eurac certificate, issued at SF200 in 1955, had by 30 September reached a price of SF414.

Philips Electronics

Philips Electronics and Pharmaceutical Industries are to buy four agricultural chemical companies. They are Agricultural Chemicals, Llano, Tex.; Ok-Tex Chemicals, Lubbock, Tex.; DePester Western Chemicals, Fresno, Calif.; and Specifide Inc., Indianapolis, Ind. Philips' board have also authorised the acquisition of Thompson-Hayward Chemical from Consolidated Electronics Industries who own about two-thirds of Philips' stock. Thompson-Hayward make chemicals for industrial, agricultural and feed supplement uses. Altogether the five companies will add \$40 million a year to Philips' sales volume.

Polyplastic

Majority of the assets and activities of the French plastics and elastomers concern Polyplastic are to be taken over by the Kleber-Colombes rubber concern, also of France. The assets include some 200 patents and processes for the production of block polymers and the reinforcement of polythene. Polyplastic will continue in its activities as agent for a number of non-French producers of base materials for elastomer and plastic production.

INCREASES OF CAPITAL

JOHN KELLYS (LONDON) LTD., manufacturers of drugs, chemicals, oils, spices, etc., 5 Mansfield Street, London W.1. Increased by £40,000 beyond the registered capital of £60,000.

CHEMIEMETALS LTD., manufacturers of chemicals, etc., 55/57 High Holborn, London W.C.1. Increased by £5,000 beyond the registered capital of £5,000.

BERTRAM GRIFFITHS DRUG AND CHEMICAL CO. LTD., 195/197 Richmond Road,

Cardiff. Increased by £25,000 beyond the registered capital of £17,500.

WARD BLENKINSOP AND CO. LTD., manufacturing chemists, etc., Fulton House, Empire Way, Wembley, Middlesex. Increased by £100,000 beyond the registered capital of £300,000.

MACARTHYS PHARMACEUTICALS LTD., Macrom House, Seymer Road, Romford, Essex. Increased by £230,000 beyond the registered capital of £130,000.

NEW COMPANY

J. AND R. KENT LTD. Cap. £100. Importers, exporters, manufacturers of and dealers in artificial manures, fertilisers, acids, chemicals, etc. Directors: A. J. Kent, R. W. Kent, S. P. Redstone and W. H. Page. Reg. office: 31 Eastcheap, London E.C.3.

Market Reports

STEADY CONTRACT MOVEMENT

LONDON Moderately active conditions have prevailed in most sections of the industrial chemicals market with a steady contract movement maintained. A satisfactory home demand for the routine soda products has been reported, and there has been a fair call for the potash chemicals. Export trade enquiry continues on a steady scale but buyers are seeking keen quotations.

There is again little to report on trade in agricultural chemicals, while the position of the coal tar products is unchanged with prices well held.

SCOTLAND There has been little change in market conditions although buying has not been quite as active as in previous weeks, apart from the basic range of industrial chemicals. However, there is now a greater concentration of interest on enquiries for the ensuing year.

Price trends are also receiving particular attention as to whether the same levels can be maintained, although it appears that some increases are probable. One of the factors in this connection may be the possible increase in carriage charges.

Death caused by explosion in B.O.C. works

ONE man was killed and four others injured in an explosion which occurred in a laboratory of British Oxygen Company's plant at Wembley on 4 December. The dead man was Tom Blakeman, a cylinder fitter. Investigations into the cause of the accident are still in progress.



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Bookshelf

Second edition of Coulson's book highly recommended

VALENCE (SECOND EDITION). By C. A. Coulson. Oxford University Press, London, 1961. Pp. ix + 404. 30s.

The second edition of this authoritative text will be widely welcomed. The sequence of topics and the treatment are broadly the same as in the first edition; however, large parts of the book have been rewritten in order to introduce views currently accepted.

The second chapter now contains a section on d-orbitals. This lays the foundation for a new chapter on ligand-field theory which does justice to the remarkable renaissance of inorganic chemistry. The section on hyperconjugation is lengthened to include the views of Dewar and Schmeising who have questioned the validity of this concept.

In the compass of a short review it is possible to deal with the many excellent features of this book which is unreservedly recommended to all workers interested in molecular structure.

► Heterocyclic compounds

HETEROCYCLIC COMPOUNDS VOLUME 7. Edited by R. C. Elderfield. John Wiley and Sons Inc., London and New York, 1961. Pp. vii + 878. £15.

This volume covers the chemistry of fused-ring compounds with two hetero atoms in different rings, as well as ring systems containing three hetero atoms. W. B. Whalley contributes an extensive chapter, nearly 200 pages, on oxygen fused ring heterocycles. This is the most extensive available review on the numerous natural products which comprise this group, and will be of great interest to the general reader. In the same way the chapter on carbolines consists largely of a valuable account of the alkaloids which incorporate this ring system. The remainder of the book reviews the methods of preparation and properties of the following ring systems—naphthyridines, phenanthrolines (with brief reference to the derived metallic complexes), triazoles, and triazines, together with the oxa- and thia-diazoles and diazines. The depth of the treatment of the various topics has been adjusted, in part, to the extent to which adequate reviews are already available, but each of these chapters forms a complete survey of its allotted field. It is unfortunate that a considerable time lag has elapsed between the preparation of some of the chapters, and the publication of the volume: the editor has undertaken the task of reviewing the more recent literature, and the main English and German language periodicals have been covered into 1960. For other publications the coverage does not

extend so far. The style and quality of production are the same as for previous volumes of the series, the numerous structural formulae are clearly set. This is in the main a reference volume, the price would obviously deter the private purchaser, but it is certain to be widely used by those working in the field, and individual sections will attract a yet wider range of readers.

► Thermodynamics

CHEMICAL THERMODYNAMICS. By J. G. Kirkwood and I. Oppenheim. McGraw-Hill Book Co. Inc., New York, 1961. Pp. ix + 261. 68s.

What is special about this month's new text on Chemical Thermodynamics? Well, it is based on the late Professor Kirkwood's lecture notes and he was one of the most able theoretical chemists of his generation. The emphasis is on precision of definition, the logic and limitations of basic deductions and the consideration of some variables not always treated in such texts—surface energies, electric, magnetic, gravitational and centrifugal fields.

The care with which the material is presented makes a notable impression of exceptional soundness without unnecessary difficulties. Unfortunately, there is virtually no application of the results to experimental data: the text is essentially the basic aspects of the conventional course in chemical thermodynamics from the theoretician's point of view. As such it will have an honoured place among the many related texts and it will long remain a model of thermodynamic deductions.

► Physical analysis

PHYSICAL METHODS IN CHEMICAL ANALYSIS, VOL. 4. Edited by Walter G. Berl. Academic Press, New York and London, 1961. Pp. xi + 476. 114s 6d.

The fourth volume in this well-known series deals exclusively with separation methods. Hence it will be particularly appreciated by anyone wishing to use modern techniques for the qualitative or quantitative separation of complex mixtures. It will also be valuable to those interested in isolating pure components from a mixture.

The book contains eight sections written by experts in the use of the different separation methods described. The techniques described include those depending on differences in rates of transport (dialysis, thermal diffusion), on

differences in electrical or magnetic properties, and those depending on the use of geometrical factors (inclusion compounds, molecular sieves).

Points emphasised include the use of improved membranes for dialysis; the use of adsorbents with controlled porosity as molecular sieves and the construction of multistep automatic apparatus using differences in phase equilibria for biochemical problems.

Electromagnetic and thermal diffusion techniques are more specialised in application and not readily available to the general worker. The chapters describing these methods, however, will be of great interest to the many people involved in the field of chemical analysis.

The book is well produced and has a good index. Its price, however, will put it beyond the reach of the general reader.

► Constructional materials

WERKSTOFFE IN DER CHEMISCHEN TECHNIK. Edited by H. Bretschneider, K. Fischbeck. Dechema Monograph No. 39. Deutsche Gesellschaft für Chemisches Apparatewesen. E. V. Frankfurt/Main 1961. Pp. x + 286.

This Monograph contains 16 review articles covering various aspects of the technology of constructional materials—the materials themselves and their properties, their applications, and problems such as corrosion resistance and quality control. The contributors, are with one exception, German, but each writes from first-hand knowledge of his subject. The coverage of the different articles is, however, rather uneven, since references to the literature are not always included. This collection should prove stimulating and useful to students of chemical engineering.

► Molecular sieves

MOLECULAR SIEVES. By Charles K. Hersh. Reinhold Publishing Corp., New York, 1961. Pp. 129. 52s.

The four-page introduction to the book gives a brief account of the historical background to the development of molecular sieves. This is followed by a concise and clear account of the physical chemistry of adsorption. The next two chapters deal with the chemical, physical and absorption properties of the natural zeolites. The major part of the book is devoted to commercial aluminosilicates, i.e. Linde Molecular Sieves made by the Union Carbide Corp. and Microtraps made by W. R. Grave and Co. There is also a useful bibliography compiled in several broad topics which enables the reader to find a reference of specific interest more readily. This book is well produced and should prove invaluable to the increasing number of people who are using natural and synthetic crystalline zeolites in separating both gaseous and liquid components by molecular sieve action. For the size of the book, however, the price seems exorbitant.

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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.

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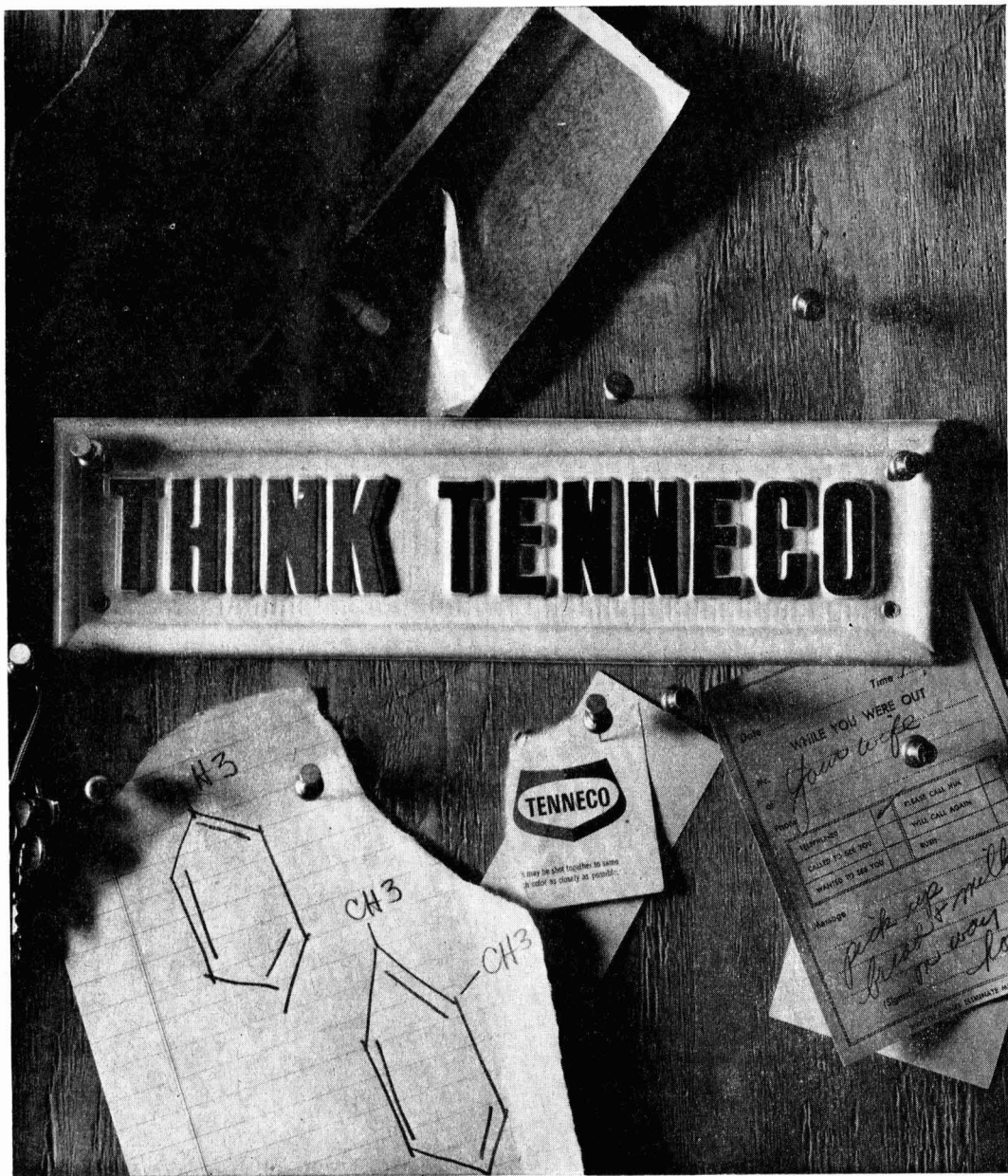
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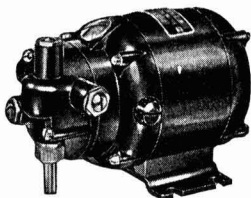
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100	32 oz. in.	12.5	4 lb. in.
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R.P.M.	TORQUE	R.P.M.	TORQUE
216	4 oz. in.	13.5	24 oz. in.
108	7 oz. in.	9	30 oz. in.
54	10 oz. in.	6.7	35 oz. in.
36	12 oz. in.	4.8	44 oz. in.
27	15 oz. in.	3.35	3 lb. in.
18	20 oz. in.	2.25	4 lb. in.

VARIABLE SPEED GEARED MOTOR—Type 'KQ'

R.P.M.	TORQUE	R.P.M.	TORQUE
200-600	9 oz. in.	12-37.5	4 lb. in.
100-300	16 oz. in.	8-22	4 lb. in.
50-150	20 oz. in.	6-16.5	4 lb. in.
32-100	32 oz. in.	4-11	4 lb. in.
25-75	40 oz. in.	3-8.25	4 lb. in.
16-50	48 oz. in.	2-5.5	4 lb. in.

CAPACITOR INDUCTION GEARED MOTOR—Type 'N'

R.P.M.	TORQUE	R.P.M.	TORQUE
456	8 oz. in.	28.5	3 lb. in.
228	13 oz. in.	19	4 lb. in.
114	21 oz. in.	14.2	4 lb. in.
76	26 oz. in.	9.5	4 lb. in.
57	32 oz. in.	7.1	4 lb. in.
38	44 oz. in.	4.75	4 lb. in.

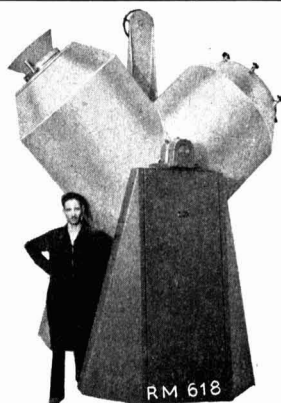
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PATENTS & TRADE MARKS

KINGS PATENT AGENCY, LTD. (B. T. King, A.I.Mech.E., Patent Agent), 146a Queen Victoria Street, London, E.C.4. City 6161. Booklet on request.

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TRADE NOTES

Equipment agency

K. W. Chemicals Ltd., Caroline House, 55/57 High Holborn, London W.C.1. have been appointed as British selling concessionaires by Walter Goerke, o.H.G., of St. Hubert, Germany, for the sale of their equipment, including automatic coil-winding machines for the plastics industry.

Silicone treatment of leather

Leather treatment is the subject of one of the latest I.C.I. folders dealing with various applications of silicones. A pamphlet enclosed with the folder describes two I.C.I. silicone products that have been specially designed for the treatment of leather, and details the method of application. Enquiries to: I.C.I. Ltd., Nobel Division, Silicones Department, Stevenston, Ayrshire.

Sealer for cracks

Development of a new sealing material with unusual properties is announced by Stuart B. Dickens Ltd., 36 Victoria Street, London S.W.1, makers of chemical products for the building industry. The new material is of low viscosity, will seal the finest of hair cracks and, because it travels by capillary attraction, will move horizontally as well as downwards. It is suitable for sealing cracks up to about 1/32 in. in width, setting into a resilient, rubbery material which adheres to the side of the crack.

Moritz chemical plant

A powder blender, model V, and continuous superphosphate dens, are the subjects of two new leaflets, 56a and 110a respectively, issued by the Moritz Chemical Engineering Co. Ltd., Thames Side, Kingston-on-Thames, Surrey.

Borax in wire drawing

Uses of borax in the neutralisation of pickling acid and as a lubricant carrier in wire drawing are described in an illus-

trated booklet which has been prepared by the technical service and development department of Borax Consolidated Ltd., Borax House, Carlisle Place, London S.W.1. Borax was first introduced for wire drawing in the middle 1940's and a steady increase in its use since that time has confirmed its value.

Change of name

Riker Laboratories Ltd., manufacturers of and dealers in chemicals, etc., 1 Morley Street, Loughborough, have changed their name to Vantorex Ltd.

New selling agents

A new range of valves and cylinders adaptable to electrical, manual or pneumatic activation of both simple functions and complicated automatic systems was recently released by Industrial Pneumatics Ltd. Sole selling agents for these valves in the U.K. are I.V. Pressure Controllers Ltd., 683 London Road, Isleworth, Middlesex.

Pipe chillers

Double pipe chillers and exchangers for use in dewaxing processes are the subject of a new brochure from A. F. Craig and Co. Ltd., Caledonia Engineering Works, Paisley. This equipment is fully illustrated and described.

Chemical-resistant linings

Corrosion Technical Services Ltd., a subsidiary of John Mowlem and Co. Ltd., have formed a new Coatings Division for the manufacture and application of chemical-resistant coatings and linings. The Coatings Division will undertake complete preparation, including shot-blasting, and application of linings and coatings to chemical plant, vessels, pipe-work and ducting.

The range of coatings includes solvent-free epoxy and polyester resins, aqueous p.v.c. and sprayed neoprene. The Division will also handle the company's

Cortec brand epoxy and polyester resin/glass laminated fabrications of tanks, pipework and ducting.

Integron tubing

Data sheets and descriptive matter on Integron High-fin and Low-fin tubing are given in a new publication issued by the Metals Division of Imperial Chemical Industries Ltd., P.O. Box 216, Witton, Birmingham 6.

Clear thermoplastic

Bavick-11 thermoplastic is now being distributed by OMNI (G.B.) Ltd., 35 Dover Street, London W.1. Advantages claimed include: resistance to chemical and solvent action, boiling water, low-pressure steam and high heat; long life indoors and out; sparkling optical clarity and resistance to breakage. The material is available in transparent and opaque colours.

Gluten sales agent

Dr. P. R. Masek, 146 Randolph Avenue, London W.9, consulting chemist and engineer, is now associated with Genie Ltd. in the capacity of sales agent for Gluten. Enquiries should be addressed to Dr. P. R. Masek.

DIARY DATES

TUESDAY 12 DECEMBER

S.C.I.—London: 14, Belgrave Sq., S.W.1, 6 p.m. 'Production of low sulphur aromatics' by G. Claxton.

WEDNESDAY 13 DECEMBER

S.A.C.—Birmingham, 15: Mills Lecture Theatre, The University, Edgbaston, 7 p.m. 'Fluorescent indicators for the determination of metals' by W. I. Stephen.

S.C.I.—London: 14, Belgrave Sq., S.W.1, 6.15 p.m. 'Foods low in carbohydrates'.

S. Instr. Tech.—London: Manson House, 26, Portland Place, W.1, 6.30 p.m. 'Application of complex plane methods to system design' by P. K. M'pherson.

THURSDAY 14 DECEMBER

S.C.I.—Edinburgh, 1: Heriot-Watt College, Chambers Street, 7.30 p.m. 'Burgundian Wines of France 1961' by Prof. Fraser Mackenzie.

1962

Chemical Age

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and WHO'S WHO

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