

# THE Chemical Age

VOL. LXXI

20 NOVEMBER 1954

No. 1845

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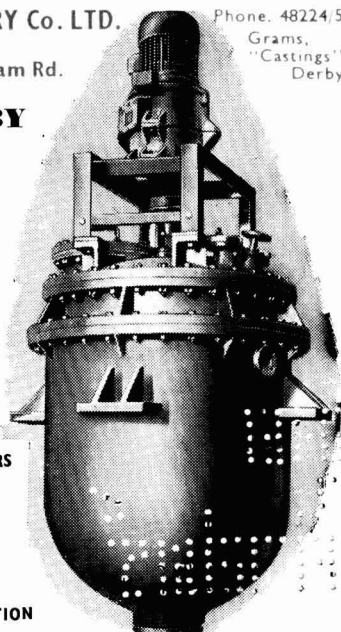
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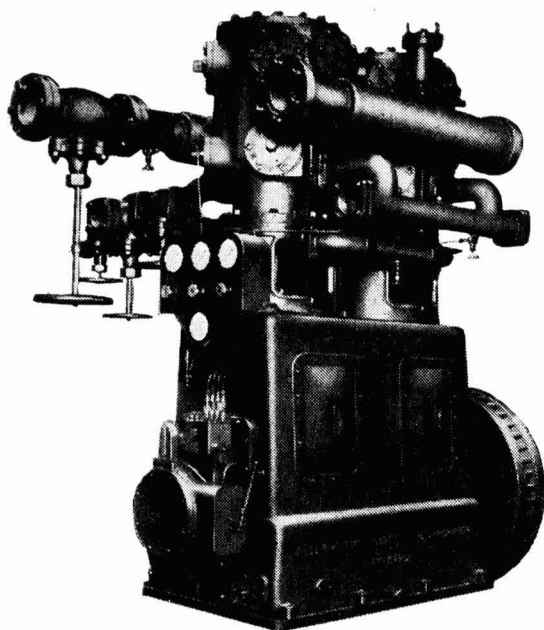
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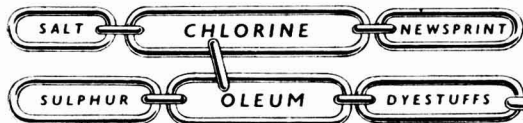
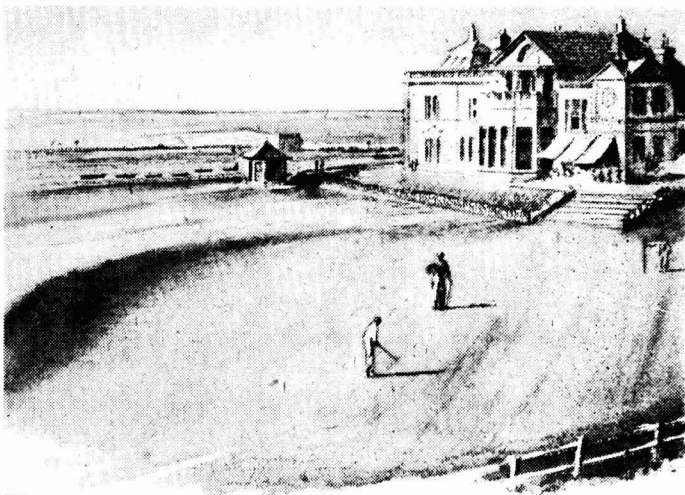
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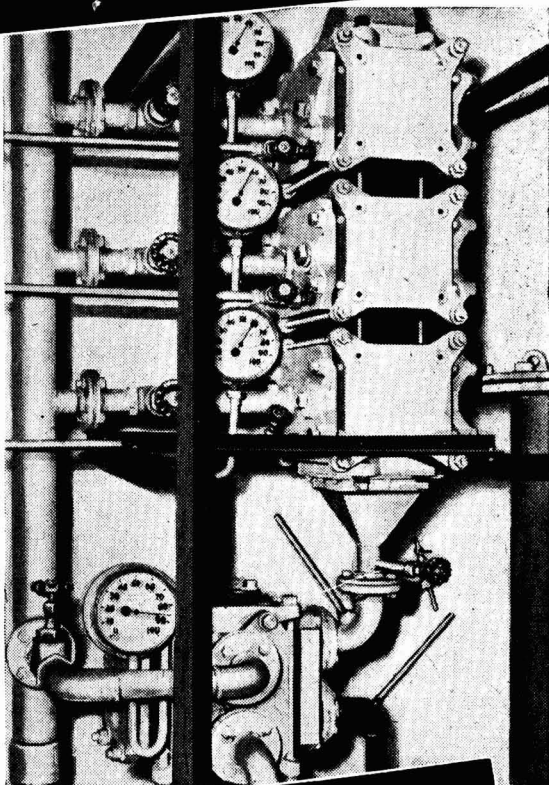
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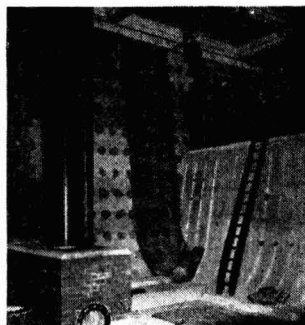
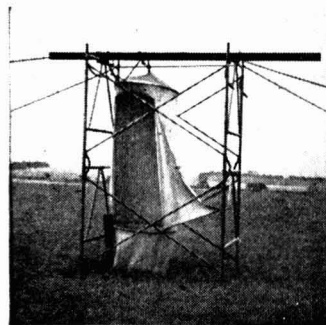
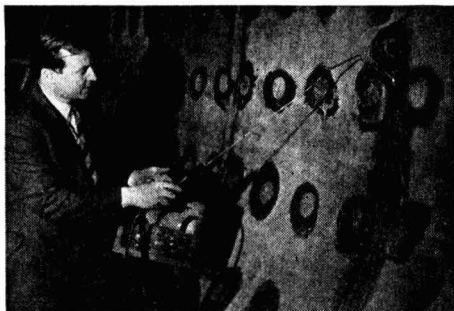
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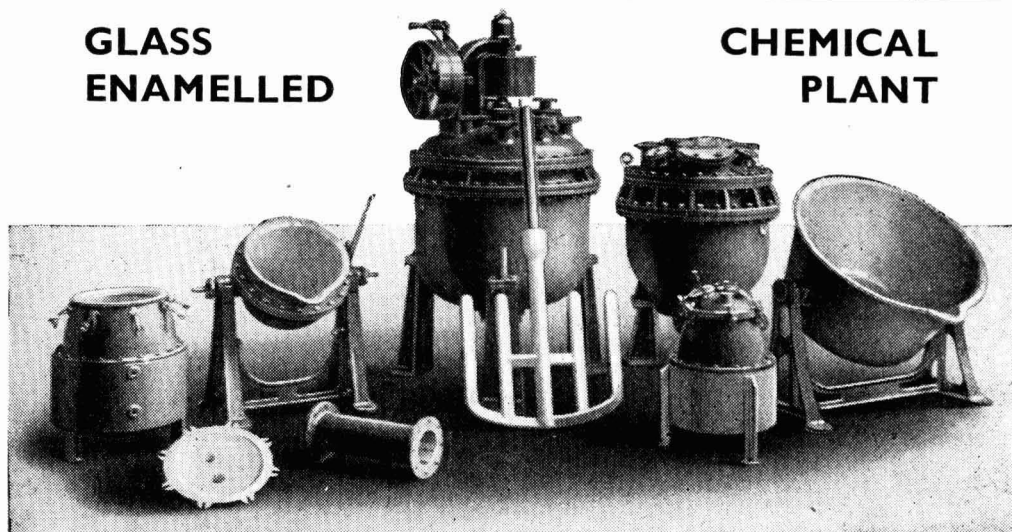


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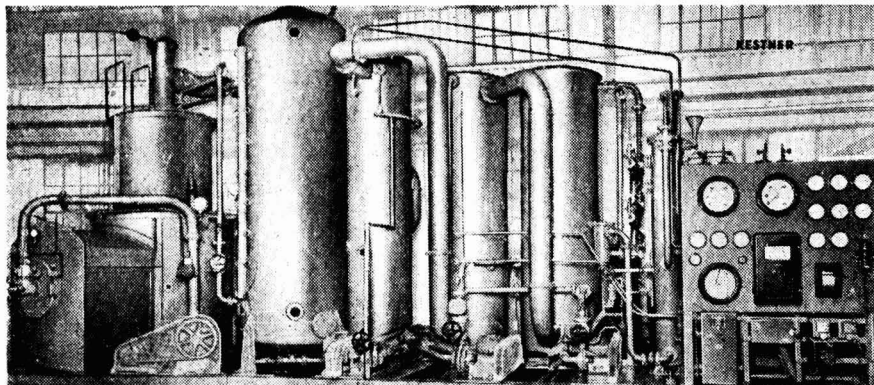
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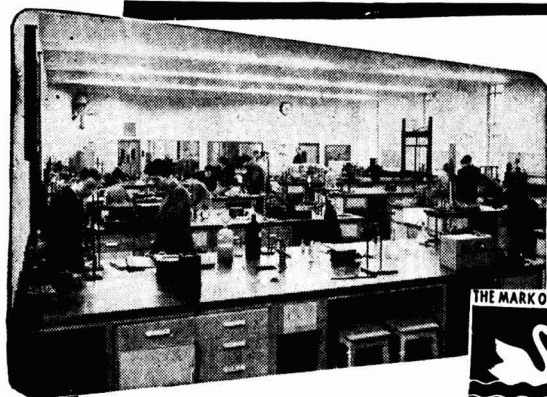
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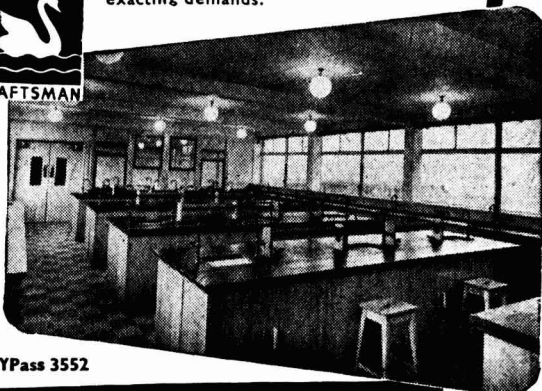
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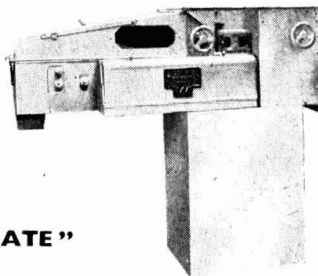
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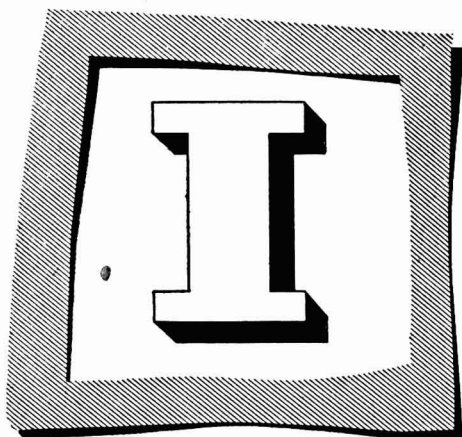
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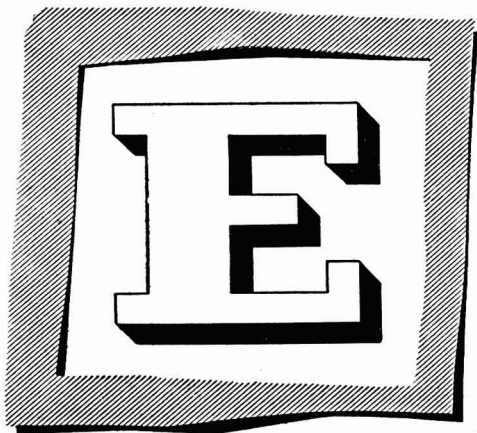
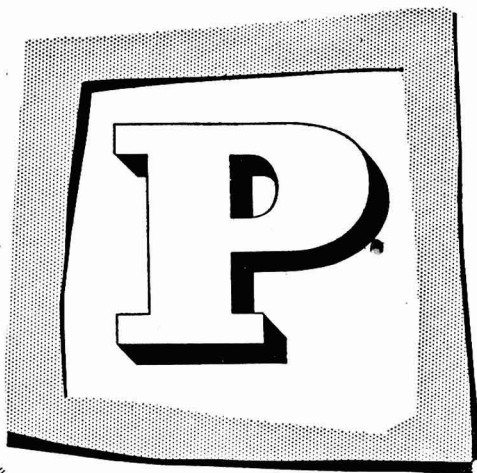
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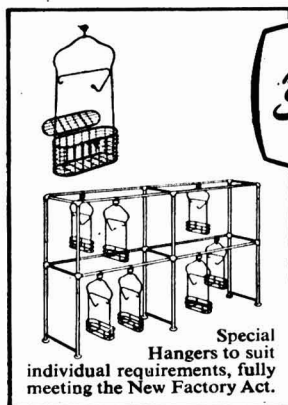
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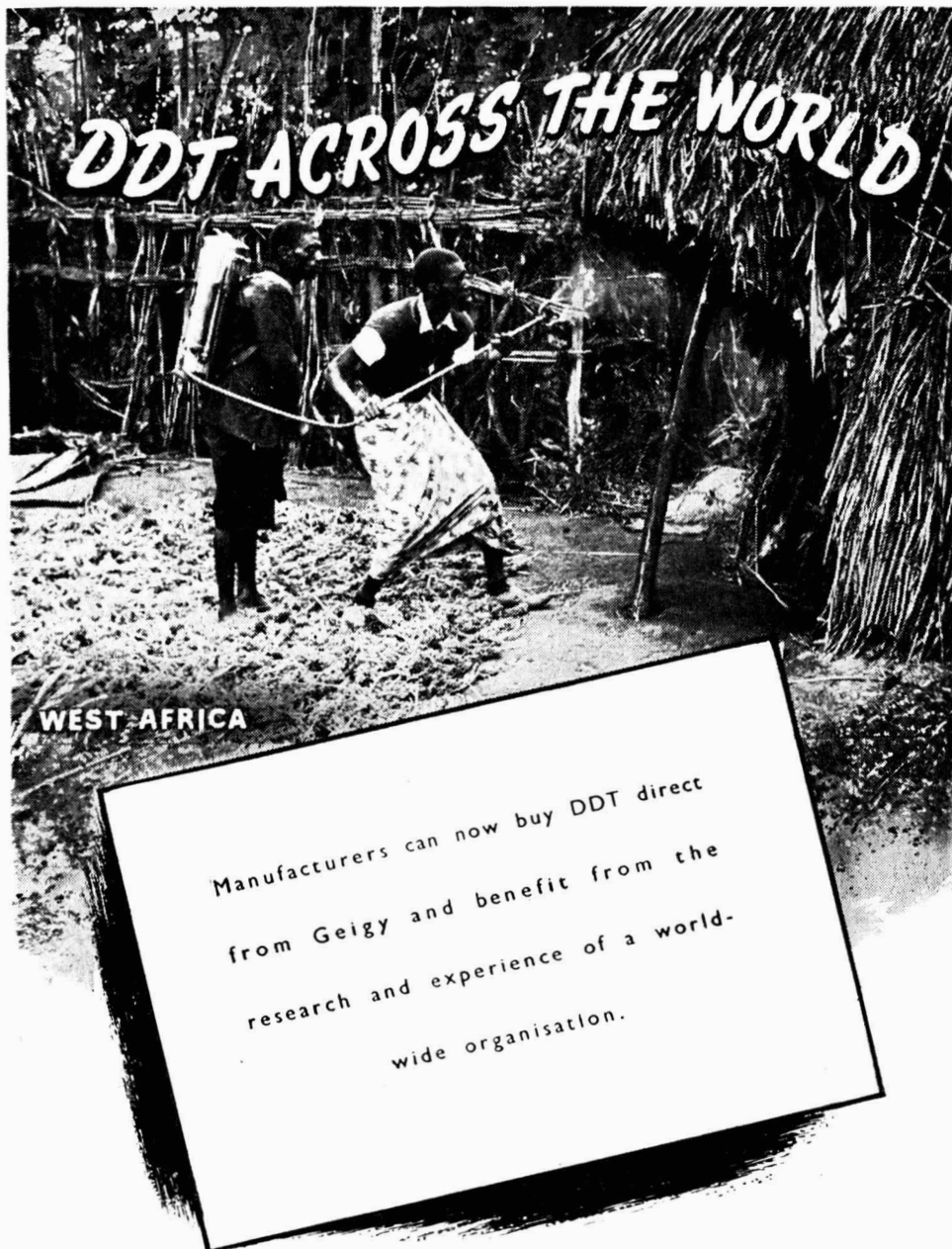
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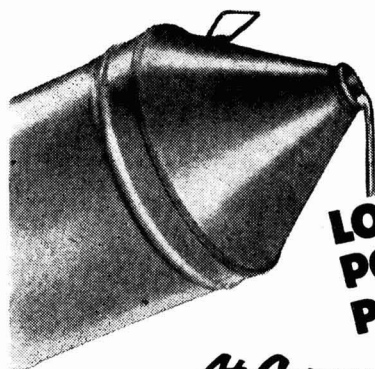
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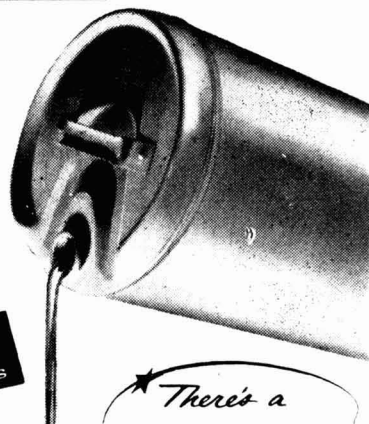
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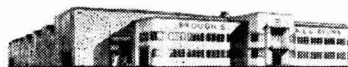
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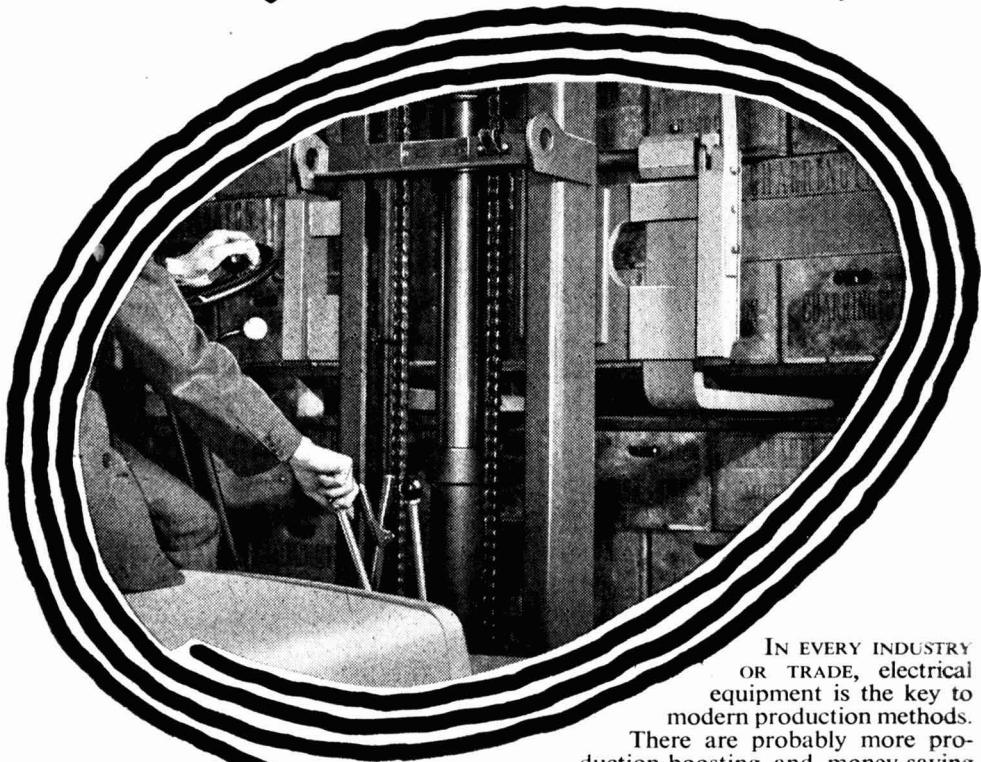
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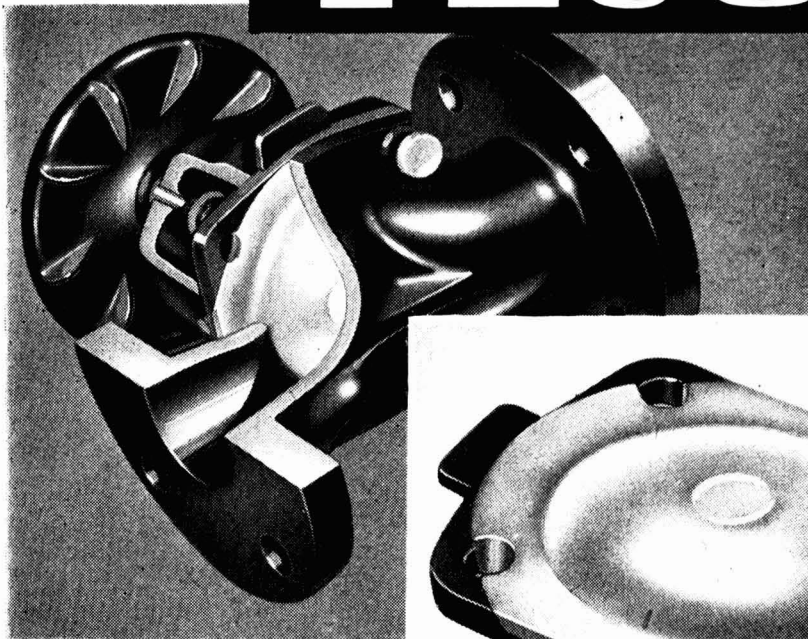
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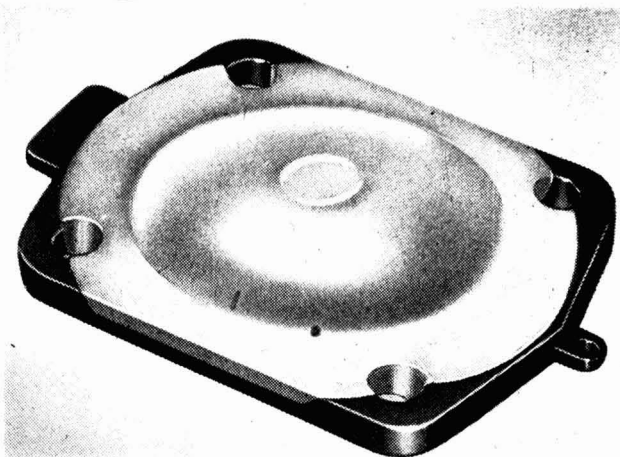
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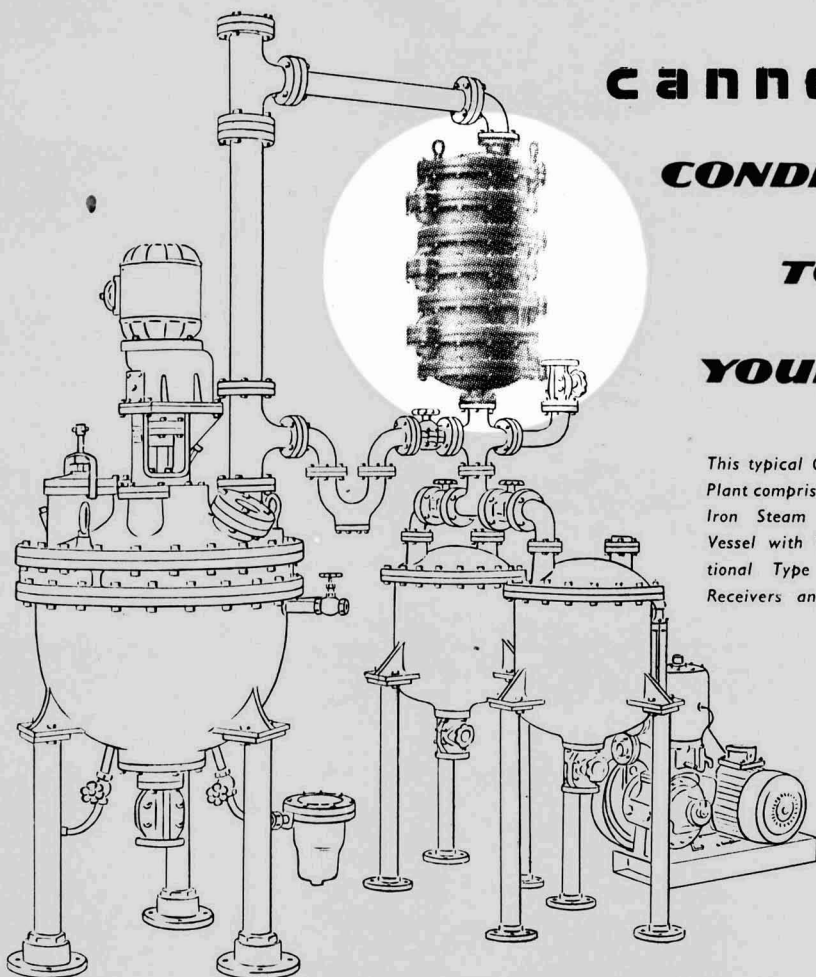
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## German Competition

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**W**HATEVER fears may have been voiced in recent years about German competition, Britain's export trade has certainly shown few signs of contraction. On the contrary, 1954 has brought notable expansion, the value of our exports in the first six months being £89,000,000 more than in the similar period for 1953. However, the same figures for Germany's export trade show an increase of DM.1,646,000,000, or £140,000,000. The post-war resurgence of Germany in world trade is still young, and the annual export turnover still considerably smaller than ours. A rise of £140,000,000 in six months is for Germany a very much bigger proportional gain than our rise of £89,000,000.

Does it mean that we are simply taking what comes in a new world trade boom while Germany is more aggressively getting out and about and increasing her natural share? This can be doubted: the Law of Diminishing Returns has a wide application. Our export-selling effort is several years older than Germany's since the end of the war and the trade it has built up is about 60 per cent larger. We are almost certainly nearer the 'saturation point' which inevitably means that each unit of expansion calls for a greater input of effort. Buyers welcome more competition for their orders; every market in which German goods re-appear gives the German seller the temporary advantage of novelty.

Western Germany is still recovering; we are consolidating not only a recovered, but a much expanded, export trade. According to a new and valuable

survey by The Credit Insurance Association Ltd., Western Germany's share of world export trade in 1953 was 5.9 per cent; the same area in 1936 was taking a share of 7.5 per cent. We should expect the present pace of German expansion to be fast and vigorous, and it is not complacent to expect the pace of our own to be somewhat slower. Nevertheless, such handicaps as the recent labour disturbances in the docks, which inevitably lengthen the times between receiving overseas orders and despatching the goods, cannot be cheerfully dismissed.

The labour situation in Western Germany gives her a much easier chance to increase output. Three years ago there were over 1,400,000 unemployed and there are still about 1,000,000 without regular jobs. One factor in this situation is the steady flow of refugees from Eastern Germany; and a high proportion of these are in the younger age-groups. Another factor, no less significant, is that Germany has not had to allocate labour and materials to a defence programme. If, as now seems likely, Germany will support an army and a defence organisation in future, her capacity to increase industrial output will certainly be affected.

A third advantage enjoyed by German exporters is less circumstantial, however, and as such it provokes more thought. Here it has long been a familiar argument among industrialists that a sound export trade cannot be built up unless it rests upon the foundation of a vigorous home trade. This theory would seem to have been given little support in

Germany; there the home demand for German goods has been strictly curtailed to such an extent that industry has been forced to find overseas buyers for its expanding output. This no doubt reflects a national economy more strained than our own and a stage of recovery still sufficiently incomplete for measures of austerity to be eased; but it may also reflect a greater national willingness to make sacrifices for the sake of the future.

Not only does the German manufacturer find that the home demand will not absorb increased production, but the taxation system gives him an incentive to sell abroad. 3.5 per cent of the export turnover can be retained free of tax, though the tax must later be paid in instalments over the following ten years. 3.5 per cent of the export turnover may be deducted from a manufacturer's taxable income and 1.25 per cent from a merchant's—in many cases, the same organisation can claim both the 3.5 and 1.25 per cent deductions. It has been said that German exports are in fact subsidised. However, the turnover tax system in Germany is complex; what it seems to amount to is that goods sold at home are surcharged as a result of the various turnover taxes, but goods sold abroad enjoy fiscal rebates.

At first sight, this seems no different in principle from our own system, under which is remitted, it is taxation they chase tax, though if sold abroad or to an overseas visitor the tax is not imposed. There is a vital difference, however. The manufacturer and the merchant derive personal benefit from the tax remission—it is not a tax that they merely collect which is remitted, it is taxation they would otherwise have to pay out of their own trade income. Germany has found that it pays to encourage export trade by incentives as well as by exhortation.

It has often been said in the last two or three years that Germany has secured export trade by offering better credit terms. There seems little doubt that Germany made a more accurate estimation of the turning-point between the sellers' and buyers' market than we did, that we continued to impose the payment terms of a sellers' market when, in fact, those conditions had started to fade.

Why a number of British commentators should have called this 'unfair' is difficult to understand. If a competitor is prepared to indulge in greater risks to get orders, he is being no more unfair than the batsman who takes bigger risks of being bowled in order to score more runs or faster runs.

However, British industrialists may feel that their complaints were examples of injustice at home rather than of unfairness abroad, for the export credit they could offer foreign buyers was determined by Treasury policy at the same time that they were being urged to sell more abroad by all the political experts of British economy. The 1952 formation of *Ausfuhrkredit-Aktiengesellschaft*, or AKA, by German banks is simply a means of centralising bank credit facilities for export trade. It could be emulated here, but we have preferred to rely upon our normal banking system. The Germans argue that AKA keeps export credit risks within bounds by removing the danger that banks in competition will offer excessive facilities.

In chemicals Germany's export trade has not risen exceptionally. Chemical exports made 12.3 per cent of her total exports in 1952 and 10.4 per cent in 1954, an indication that export trade of other kinds is making greater progress. However, much of any country's chemical output is 'intermediate' and just how far Germany's chemical industry has provided the material means by which other export trade has been gained is impossible to assess. The surplus of chemical goods available for export as such may not be able to expand—yet. Small swings in the balance of supply and demand can very quickly produce large surpluses. It would be a grossly stupid mistake to assume that Germany's chemical industry will continue to make a more sluggish recovery than her engineering, automobile, electrical, and ship-building industries. Nor are our comments on this same subject a few months ago (see *THE CHEMICAL AGE*, 1954, 71, 413) any less valid. The powers that decartelised the IG-Farben trust expire in 1956, and it is surely one of the most certain by-products of the London agreement on German re-armament that these powers cannot be re-imposed.



## Notes & Comments

### Out of this Nettle

‘ANOTHER subject that I should like you all to think about is whether or not we would not all benefit materially if we could arrange for more exchange of experience. . . . Perhaps these days living a little dangerously would pay handsome dividends.’ An extract from the speech of Mr. W. J. Worboys, chairman of ABCM, at the Association’s dinner. ‘The party of the second part will not during his employment by the company or at any time thereafter, disclose or communicate to any person or persons, company or corporation, other than the company or any person or persons nominated by it, any information whatever which is the property of the company and is obtained or acquired by him in relation to any processes, methods, formulae, drawings, recipes, appliances, buildings, machinery, apparatus or plant, which may from time to time during his employment be manufactured or be in process of being experimented upon by the company or which may have been manufactured or experimented upon by the company or by any person or persons by or under the order or direction or for the benefit of the company, or in relation to any investigations or experiments made or from time to time during his employment to be made by the company or by any person or person by or under the order or direction or for the benefit of the company.’ And that was an extract from the staff contract of a well-known chemical company, members of the Association. As a precaution against indiscretion on the part of individual employees it is a reasonable measure, but it represents in fact the declared policy of the company. And it is only a few days since another member company put through a rather worried telephone call to this office, because we had published figures, taken direct from the freely-available Board of Trade returns, of exports of a particular chemical of which they were manufacturers. Mr. Worboys’s words, we fear, fell on deaf ears.

### Cleft Stick

IT is not, of course, all the fault of the manufacturers. Much has been made in this country of the unnecessarily stringent security measures which the US Government impose on atomic information, but the Americans, both as private companies and Government organisations, are on the whole much freer with facts. *Chemical & Engineering News* recently published details and photographs of a plant manufacturing nerve gases—in this country the Service chiefs regard every chemical works, refinery, gas works, power station, light and heavy engineering factory, in fact almost every conceivable industrial building, as part of the ‘war potential,’ and if they had their way it would be impossible to publish details of the erection, location and output of any factory in Great Britain or the Commonwealth. Between the impassive but powerful, brown and two shades of blue, sea on the one hand, and the marauding devils of Fleet Street on the other, chemical manufacturers are in a fix.

### Tell Us a Story

NEVERTHELESS, there is much that the members of the ABCM, and others, could do without endangering the national security. An American company, about to erect a new plant, is only too pleased to furnish details of expected output, estimated cost, the date when it is hoped to begin production, perhaps even the probable price of the product. We frequently receive in this office a report from one of our provincial correspondents that Company X has purchased a site somewhere, that a factory is already in course of erection, and that the products are to be such-and-such. In the interests of accuracy we telephone the press officer of Company X, and read him the report. Over the line a cautious voice says ‘Can I ring you back?’, and half an hour later, ‘I say, old boy, you’re substantially correct, but we’d be rather grateful if you wouldn’t

use it just yet. I mean, it may be some months before we go into production, and we don't want our customers to be disappointed. And we'll be sending out an official story soon.' Six to twelve months later, a short news item arrives to say that Company X is now manufacturing new products, and after a further year has elapsed the Press are invited to visit the 'new' factory. The recent decision of USAC to show their factory at Widnes before it was completed is one to be applauded, and we hope that this is the beginning of a new policy. If chemical companies are so reluctant to allow the publication of generalised descriptions, will they ever be able to countenance the exchange of technical details?

### A Different Picture

THESE somewhat petulant observations have been provoked by the arrival in this office of two volumes from the McGraw-Hill Book Co. One is a special Inventory Issue of *Chemical Engineering* (61, [13]), containing 360 pages of notes on new processes, chemicals and materials, equipment and accessories, technical literature, and plants and facilities. It is this section which is particularly striking: 482 important new plants are listed, planned, under construction or completed during the last half of 1953 or the first half of 1954. Details given include location, products, estimated cost, and expected output—even the date when the plant is to go into operation. The impression given by this overwhelming list is of a vital, enthusiastic industry, filled with boundless energy. It is the typical American practice of selling oneself in a big way, and how insignificant British chemical industry sometimes appears in comparison. The other book is 'Chemical Business Handbook,' edited by the late Dr. J. H. Perry. (McGraw-Hill, London, 1954. Pp. 1375. £6). This is a mammoth volume, which covers, in 20 sections, and with the help of 124 contributors, every possible aspect of chemical business, from how to choose an employee to how to float a company. It is a compilation of inestimable value, and the editor obviously received great

help from many American chemical companies. Outstanding among the contents is a 130-page table giving annual production, sales and manufacturers, during the past 10 to 15 years, of about 1,000 different chemicals in the US. Anybody who has ever attempted to find out the British production of the commonest chemicals will appreciate the sentiments which reviewing this book prompted us to express in the paragraphs above.

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### Chemical Price Index

NEW composite wholesale price index numbers relating to the products of the chemical and allied trades—mainly dyestuffs, fertilisers, disinfectants, plastic materials, general chemicals, drugs, pharmaceuticals, toilet preparations, paint, soap and synthetic detergents—are published for the first time this month by the Board of Trade. Figures for the past six months May-October are 130.8, 131.0, 131.0, 131.0, 131.2, 131.2 (30 June 1949 = 100).

Within this class, dyes and dyestuffs have shown no variation from 129.0 during the past six months; disinfectants rose from 108.8 in May to 112.1 in June and have remained there; weed killers, insecticides and fungicides dropped 0.1 per cent to 123.2 in June; and synthetic resins and plastics steadily fell from 121.6 to 121.1. Among general chemicals, benzole, after keeping steady for many months, rose from 177.1 to 182.9; caustic soda and soda ash have remained unchanged since May; BOV rose from 156.7 in June to 160.1 in July, and ROV kept at 172.9. Synthetic detergents have been unchanged for a very long time.

In commodities wholly or partly imported, carbon black is still unchanged at 136.0, while fertilisers have fluctuated regularly. Pyrites also have been unaltered at 168.8, and crude sulphur rose from 158.9 to 160.4.

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### Rise in Paint Exports

In the 12 months ended last September paint exports were worth £10,740,000, compared with £9,560,000 the previous year, a rise of more than 12 per cent. In volume, the increase was nearly 14 per cent.

## 'Safety is Everybody's Business'

### ABCM Conference Stresses Right Attitude of Mind

THE importance of a 'safety' attitude of mind among employees was stressed at the Association of British Chemical Manufacturers' chemical works safety conference which, as briefly reported last week, took place from 5 to 7 November at Harrogate. Delegates were welcomed by the Mayor of Harrogate on the first evening and were also given explanatory talks by representatives of I.C.I. from Billingham and Wilton on the arrangements for the visits to these works on the following day.

Dr. I. J. Faulkner of Billingham Division said: 'The general standards of safety when production started were nothing like they are today and we have had to modify, change and adapt many things in the Billingham factory to bring it up to something like the modern standards of working places. While we realise we still have a long way to go it will be of interest, first of all, for you to see what changes in the accident rate have been achieved over the years and the first thing to which I would draw your attention is the change in frequency rate since 1930.

#### Lost Ground Regained

'The figures, if considered year by year, show that the frequency rate deteriorated during the war but has since returned to and improved upon the best of the pre-war years. Just a reminder so that we are all talking in the same terms; the "frequency rate" is the number of lost-time accidents per 100,000 hours worked—in fact, the statistical chance of the number of lost-time accidents a man will have in his normal working life (say between the ages of 16 and 65). Since so many accidents are due to lack of imagination and forethought, a good man who is taking reasonable precautions and thinking what he is doing has an excellent chance of having no lost-time accidents for the whole of his working life.

'While it would be wrong of me to say that we have reached the limit of the improvements that we can make by actual physical improvement of the working places and by the installation of safety devices, etc., it is becoming more and more obvious



*Dr. G. I. Higson (chairman of the Billingham Division of I.C.I.) proposing the toast to Harrogate at the ABCM dinner on 5 November*

that the emphasis has got to move from even safer devices to safer ways of working, from an "it can't happen to me" attitude of mind to an "it is not going to happen to me" attitude. While you can take a horse to the water he will only drink, if he is thirsty and, similarly, while you can provide everyone with goggles they will only wear them if they realise that there is a chance, however remote, of losing their eyesight.

'It is worth noting that most of our accidents today are not associated with our business as chemical manufacturers. It is not easy to sort out figures, but roughly one in ten of our accidents can be ascribed either to chemicals or the exigencies of the process; the remainder are accidents that could happen equally well in the home and, although this is a conference of chemical manufacturers, almost all of what we say is of general application.

'In the course of the tour you will see some of the older parts of the Billingham factory and some of the newer ones. In the older parts the layout is congested and it is worth noting what can be done to open up a congested space by the use of bright and attractive colours and the installation of modern instrument panels with the small flush-mounted instruments. Moreover, remote controls and mechanically

operated valves etc. tend to reduce the congestion.

'You will see parts of the site which are unattractive. You will see other parts which years ago were the same but which are now a pleasure to look at and where untidiness—a frequent source of accidents—almost seems sacrilege. You will see operators removed entirely from working amongst machinery and provided with a workroom away from hazards and working their plants entirely with remote control. What you will not see, and we cannot show it to you, is the trouble we take to make every one of the people working on the site interested in safety. We regard safety as everybody's business and we expect a contribution from everybody. These contributions are not only in the form of physical suggestions, but also in the inculcation of an attitude of mind which anticipates hazards and takes what action is available to prevent avoidable accidents taking place.

'So much do we regard this as a co-operative effort that you will notice that members of the factory payroll have been invited to share with the management the duty of guiding you round the factory tomorrow. The copy of the *Billingham Post*—our fortnightly magazine—indicates how we try to make everybody feel a part of the accident prevention scheme, and when you visit the exhibition in the works you will see there, too, many examples of this attempt to make safety everybody's business.'

Dr. C. Cockram of Wilton Works said: 'At Wilton, we have set out with the object of building a chemical works which is efficient and is also pleasant to work in.

We believe that work in a chemical factory can be as safe as it is in the best factory in any other industry.

'Since the construction of Wilton Works was started in 1946 we have put into operation 12 major plants. Many of these plants are operating on processes which are quite new or are new to I.C.I. The greater number of these plants have been put into operation since 1950. The number of workers employed by I.C.I. on the Wilton site, including those employed on Divisional plants, has increased from 1,000 in 1950 to 4,000 today.

### Most Important Factor

'In 1950 our frequency rate for lost time accidents was 3.5 per 100,000 hours. (The frequency rate for I.C.I. was about 1.5.) By 1953 we had reduced this to below 2.0. For the first six months of 1954 our frequency rate is 0.84, compared with the whole of I.C.I. at 1.05. These figures are quoted to illustrate the point that plant design and safety rules only go part of the way to achieving a good record for safety. *The attitude of the individual is still a most important factor.*

'In starting up our plants we have had to recruit large numbers of men who were promising material but had little or no experience of a chemical works. Much of the time of staff and supervisors was occupied with the technical problems associated with new processes and in training men to work the plants.

'Safe working is only achieved when every individual is familiar with the plant on which he works and he has learnt the safe way of doing a job and does it naturally in a safe way. A lot depends upon team work between technical staff, supervisors, men and safety officers. To achieve this in safety matters requires a lot of slow and patient work. Much has been done through Works Councils and plant Safety Committees.

'Rather than try to force safe working by penalties for disobeying safety rules, we have adopted the less direct approach of discussion with the men on the causes of accidents. In this way we have achieved intelligent co-operation from the men in regard to rules and the use of protective gear. With much of the spadework now done, we are looking forward to achieving the I.C.I. target figure of a frequency rate of 0.5, in spite of continued recruitment.'

At a dinner given by I.C.I. to the



**Mr. W. J. Worboys (chairman of the ABCM), and delegates examine the poster display at Harrogate**

delegates at the Hotel Majestic on 5 November, Dr. G. I. Higson, Billingham Division chairman, presided and the principal speakers were Mr. E. A. Blench, Billingham Division production director, and Mr. W. J. Worboys, commercial director of I.C.I., who is a former Billingham Division chairman and is chairman of the ABCM.

Proposing the toast of 'The Association', Mr. Blench said it rendered considerable service to the industry as a whole because, while allowing member firms to carry on their work in their own individual manner, it took a lead where common action for the industry was desirable.

Referring to safety, he said the presence of senior representatives of many firms as well as members of production and safety staffs demonstrated the increasing realisation that safety was the concern of everyone in industry.

'Safety work,' he said, 'can be regarded as of the real essence of industry. In its work industry uses the scientific, natural and human resources of the country. One has to have a humanistic as well as a scientific approach and what better example of that is there than the safety officers?'

In his reply, Mr. Worboys said that as industrialists they must be concerned about humanity as well as materials. On the humanity side they wanted to minimise suffering and on the materials side they wanted to use all that were to hand as efficiently as possible.

'If safety is high,' he said, 'not only shall we economise in the human content of industry but we shall economise in plant and equipment. Safety is something you have to think about and to which you must have the right attitude of mind for every



*Delegates inspecting the protective appliances used at Wilton power station*

one of the 365 days in the year. We require not only a skilful, vigorous and determined management but the full co-operation of the workers.'

He said that management must endeavour to get a worker to appreciate that it was in his general interest that they were working for safety and not merely to protect him from accident.

An exhibition of the devices, protection equipment, etc., used at Billingham and Wilton was held in the Conference Room of the Hotel Majestic during the week-end. On the morning of 7 November, when the conference came to an end, there was a short discussion on the visits of the previous day.

Footnote: On Monday, 8 November, the safety precautions at Billingham received a practical test when there was an explosion in the ammonia plant and an outbreak of fire. The flames were quickly brought under control, and the damage was described as 'not serious'.

## **New British Standard**

THE British Standards Institution has just published a standard for the determination of water by the Karl Fischer method. Three techniques are described: the double burette system using an electrometric end-point, the single burette system using an electrometric end-point and the single burette system using a visual end-point.

The application of these techniques to the determination of water in liquids and in solids capable of being dissolved in methanol or other suitable solvents is discussed, and brief recommendations are given

for the modification of the procedure for use with materials such as alkalis, oxidising agents, ketones, etc., which would react with the components of the Fischer reagent. The preparation and standardisation of the Fischer reagent are fully described.

Among the organisations which co-operated in the preparation of this standard were: Ministry of Supply, Association of British Chemical Manufacturers, British Laboratory Ware Association and the British Plastics Federation.

Copies of this British Standard (BS. 2511: 1954) can be obtained from the British Standards Institution, price 5s.



## Baghdad Fair

### An Immense Success

THE British Trade Fair at Baghdad, held from 25 October to 8 November, was 'an immense success', Sir Norman Kipping, Director-General of the Federation of British Industries, said at a Press conference last week. People came in their tens of thousands, he went on, and nothing of any importance would have to be brought back to this country again.

The fair was attended by 330,000 people from all over the Middle East and from the Sudan, India and Pakistan. It is not at present possible to assess the volume of business done, but practically no products on show were unsold—including the prefabricated buildings which housed the exhibits. Even the ice rink, intended mainly as a demonstration of British refrigeration and air conditioning and as a public attraction, has been the subject of several offers as it stands. A good deal of engineering equipment was sold 'over the counter'.

Among the firms represented at the fair were: Albright & Wilson Ltd., J. Bibby & Sons Ltd., The Chiswick Polish Co. (Overseas) Ltd., The Crookes Laboratories Ltd., H. E. Daniel Ltd., Elsan Manufacturing Co. Ltd., Evans Medical Supplies Ltd., Richard Hodgson & Sons Ltd., Imperial Chemical Industries Ltd., Khanaqun Oil Co. Ltd., John Kidd Ltd., Matthews & Wilson Ltd., May & Baker Ltd., The Nugget Polish Co. (Sales) Ltd., The Pyrene Co. Ltd., Reckitt & Colman (Overseas) Ltd., E. & F. Richardson Ltd., Sealocrete Products Ltd., G. D. Searle & Co. Ltd., Smith & Nephew Ltd., Peter Spence & Sons Ltd., Robert Young & Co. Ltd., Costain-John Brown Ltd., Blaw Knox Ltd., British Aluminium Ltd., Fibreglass Ltd., Northern Aluminium Co. Ltd., Pinchin Johnson & Co., The British Thomson-Houston Co. Ltd., Evershed & Vignoles Ltd., Hanovia Ltd., Mather & Platt Ltd., National Oil Engines (Export) Ltd., The United Steel Companies Ltd., Dunlop Rubber Co. Ltd., APV Co. Ltd., Babcock & Wilcox Ltd., Baker Perkins (Export) Ltd., Davey Paxman & Co. Ltd., Dorman Long & Co. Ltd., English Steel Corporation Ltd., Manesty Machines Ltd., Mechans Ltd., Metal Propellers Ltd., Peerless & Ericsson, The Power-Gas Corporation Ltd., The Quasi-Arc Co. Ltd., The Staveley Iron & Chemical Co. Ltd., and John Thompson Ltd.

## Keener Competition

ENTRANCE of Union Carbide & Carbon Corporation into petrochemical processing in Canada signals sharply stepped-up competition in the domestic marketing picture. Their purchase of Dominion Tar & Chemical's Montreal East petrochemical plant for manufacture of ethylene glycol and later polyethylene (THE CHEMICAL AGE, 1954, 71, 944) means increased marketing headaches for two chemicals now in the tariff news.

It was inevitable that Union, already a powerful factor in the chemical business in Canada, and with several sizeable plants already operating in other lines—should sooner or later jump into the petrochemical field. Company officials have apparently been looking into the establishment of petrochemical operation in the country for some 10 years. These plans had advanced to the stage where preliminary construction plans for a new plant were being discussed.

The availability of the Montreal plant plus the expected tariff protection to be awarded both ethylene glycol and polyethylene are believed to be the two factors deciding Union to establish operations.

There is also a good chance that the fourth largest chemical company in the United States, Olin Mathieson Chemical Corporation, New York, will soon be entering Canada. Dominion Tar & Chemical Company's chlorine and caustic soda plant at Beauharnois, Quebec, is being considered for purchase.

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## Funds for Research

THE following are among the grants to British institutions announced by the Rockefeller Foundation in New York:—

Strangeways Research Laboratory, Cambridge, £10,700 for the purchase of an electron microscope; King's College, London, £10,700 for the biophysical research unit; Royal Institution, £5,350 for research on the structure of proteins; University of Birmingham, £5,350 for research in the chemistry of carbohydrates; University of Aberdeen, Department of Biological Chemistry, £2,570 for equipment to be used in general biochemical research; University of Edinburgh, Department of Chemistry, £16,083 for a five-year programme in the field of the natural high polymers.



# Work Study to Increase Productivity

## Lecture to British Association of Chemists

**E**XAMPLES of saving in costs and increased productivity were given by Mr. J. Grange Moore, M.A., deputy head of the Central Work Study Department of I.C.I. Ltd., when he spoke on 'Work Study as a Means of Improving the Efficiency of Chemical Plants' to a meeting of the London Section of the British Association of Chemists on 10 November.

Work study was concerned with making more effective use of every resource and was now being applied at all stages from design to the methods of plant operation, to improving the planning of work and the use of manpower, and to improving the effectiveness of all employees.

To do this it was important to have a system of measuring the work content of jobs and the effectiveness of human work. For this purpose a scale of 'work units an hour' had been evolved. The work unit consisted of a fraction of work and a fraction of rest, the ratio between the two depending on the arduousness of the work. A performance of 80 work units an hour was taken as the standard which could be continuously maintained, and although the scale was an arbitrary one and made no claim to precise scientific accuracy, it had proved of great value as a basis for planning physical work. Work measurement, indeed, made possible the determination of the proper time to be allowed for the effective performance of a specified task.

### Principles of Method Study

Mr. Grange Moore then described the basic procedure of method study, the other essential in work study, which involved selecting the work to be studied; recording all the relevant facts; examining facts critically and courageously in ordered sequence; developing the best method under prevailing circumstances; installing that method as standard practice; and maintaining that standard practice by regular checks.

Where financial incentive schemes were appropriate, these were based on the work content of the improved method and were so pitched that a worker maintaining standard performances of 80 work units an

hour received at the end of the week a bonus of  $33\frac{1}{3}$  of his plain time job rate.

Mr. Grange Moore then showed a selection of actual examples of how work study had increased productivity in chemical manufacturing processes. For example, the method study of the manufacture of a crystalline salt had shown that the specification was unnecessarily stringent, and needless processes were being undertaken. As a result of reducing the number of processes, production costs were reduced by 9 per cent and plant output was increased by 25 per cent.

### Increased Earnings

In another example—the batch production of an inorganic salt—plant capacity had been found to be limited by the time taken to clean out an insoluble sludge. By studying and standardising this operation, production was increased by 35 per cent, labour was reduced by 43 per cent and the men's earnings rose by 33 per cent.

Output in one plant was limited by a lack of special and costly containers. A multiple activity chart showed how better use could be made of each existing container, and the required output was achieved without having to buy additional containers at heavy capital cost.

In another case improved use of materials was actually achieved by adding two men to the labour force, instead of reducing the number. These two men were able to give special attention to the control of the use of expensive ingredients, and as a result the net saving was £8,500 a year.

Answering questions after his lecture, Mr. Grange Moore said his advice to managements who wanted to introduce work study into their own plants was either to call in a first-class consultant, who must also train the firm's employees to carry on after he had left, or to send their experienced technical men to be trained at certain establishments where adequate facilities for such training existed. Advice on these matters could be obtained from the Association of British Chemical Manufacturers, who had now appointed their own work study officer, and from the British Institute of Management.

# Indian Newsletter

## FROM OUR OWN CORRESPONDENT

THE National Industrial Development Corporation has just been registered as a private limited company under the Indian Companies Act, with a share capital of Rs. 10,000,000 (£750,000), of which a tenth has been subscribed. The Corporation will stimulate directly or indirectly industrial enterprise in new fields or where considerable scope for expansion exists. The board of directors of the Corporation, drawn from the Government and industry, have prepared a list of industries in which investigatory work should be taken up. In the first instance the manufacture of plant and equipment for, among others, the chemicals, cement and paper industries has been set down for study. Some of the other industries listed for development are heavy chemicals, fertilisers, coke-oven and coal-tar products, methanol, formaldehyde, carbon black, synthetic drugs and ferro-alloys and non-ferrous metals.

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According to the Minister for Production of the Government of India, the early establishment of a factory to produce 1400 tons of DDT per annum somewhere in South India is being considered. The capacity of the factory at Delhi which stands at 700 tons may also be doubled. Further the Government of India are contemplating the setting up of two fertiliser projects, more or less of the size of Sindri. It may incidentally be remarked that the Sindri fertiliser factory reached a production record last month with an output of 7,337 tons of ammonia and 25,620 tons of ammonia sulphate, while the monthly average production for the past 18 months had only been 6,112 tons and 21,334 tons respectively. The new fertiliser factories may be located at Bakra Nangal and a suitable site in South India. The Government has appointed a five-man committee to make recommendations on the expansion of the nitrogenous fertiliser industry in the country. Owing to increased consumption of nitrogenous fertilisers, the three present production units in the country are unable to meet the entire demand. The total production in 1953 was only 295,820 tons of ammonium sulphate.

In consonance with trends on rapid industrialisation of India, the Economic Commission for Asia and the Far East has urged greater use of electricity for the expansion of the chemical industry in India and also in the countries of the region. At a recent meeting of the Committee on Industry and Trade, a survey of the fertiliser, electrolytic alkali-chlorine, manganese dioxide, calcium carbide and petroleum refining industries was made. With particular reference to India, the committee's report states that though India has (1953 figures) a production capacity of 1,420,000 tons of ammonium sulphate, there is great scope for ammonia-based fertilisers. The caustic soda industry also can expand considerably. As the disposal of the chlorine gas in the alkali industry is a serious problem hampering progress, the interlinking of factories for manufacture of ammonium chloride and caustic soda would appear to have economic advantages. The present production of about 150,000 tons of superphosphate in 14 factories in India is only 3 per cent of the total phosphatic fertiliser requirements of the country and therefore there is enormous scope for the establishment of more phosphatic fertiliser factories, as India has good resources of low grade phosphatic rocks. The large scale manufacture of calcium carbide may be attempted and could be the starting point for many industrial raw materials such as cyanamide, acetylene and others. In view of the large reserves of low grade manganese ores in India, electrolytic production of pure battery grade manganese dioxide may be undertaken and could be made into a great industry. The three oil refineries under construction will have obviously immense chemical and petrochemical potentialities.

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DR. KALYANBHAI HIMATLAL SHAH, organic chemist of the Department of Chemical Technology at Bombay University, India, has arrived in Israel to take up one of the four overseas Chaim Weizmann Memorial Fellowships for 1954-55 at the Weizmann Institute of Science. Dr. Shah will spend a year in research at the Institute.

# Acetylene Explosions

## Wide Range of Chemical Work for Home Office

**I**NTERESTING work carried out by the Home Office Group at Woolwich, and at Bristol and Birmingham Universities, is described in the report of HM Inspector of Explosives for 1953 (HMSO, 1s. 9d.). Most has been concerned with compressed acetylene.

Work on the investigation into the explosion of an acetylene generator at a large steel works was completed by the issue of the metallurgical findings. The examination was mainly concerned with the weld between the body and the dome of the generator, which had parted. Micro examinations were restricted to sections from only a few points along the peripheral weld, since the cylinder was 3 ft. 6 in. in diameter.

Visual examination was much impaired by rusting, but as far as could be seen the weld had been continuous, without voids, around the periphery and had been applied with a notably uniform depth of penetration. But micro-examination showed that, whereas the base and side seams of the generator had been double welded, inside and out, the dome had only been welded from the outside.

### A Slender Weld

The thickness of the metal used in the body and dome was about 0.10 in. and the welded joint appeared to be only about 0.07 in. This weld had not only to serve as a gas seal, but had also to withstand any stresses, either induced during welding or encountered in the somewhat rough handling that an apparatus of this kind is likely to suffer occasionally.

It was concluded that the weld was unduly slender in relation to the size of the apparatus and that if, in the course of jiggling for welding, any pressure had been applied to bring the top of the cylinder and the rim of the dome into alignment, then the weld would from the outset have been unduly stressed.

Three investigations were undertaken into incidents involving dissolved acetylene. In one a cylinder filled with monolithic mass being delivered to a works was dropped on to a cobbled surface, and burst longitudinally. There was no evidence that pre-

vious heating had occurred, but the bottom of the cylinder was pitted, corrosion being especially serious where the weld met the base. It was concluded that mechanical failure had occurred, possibly helped by the shock initiation of free acetylene gas in a cavity.

A considerable amount of work has been done on the explosive properties of liquid and solid acetylene and of mixtures with substances suitable for forming stable liquids, in an endeavour to assess the hazards in industrial use of such materials. Tests have shown that both the liquid and the solid must be regarded as explosive, whereas by the same standard ammonium nitrate, for instance, is inert. When mixed with small amounts of  $\text{CO}_2$  and acetone the explosive power is considerably reduced, but it is not yet clear to what extent the mixtures remain dangerous.

### Experiments on Ignition

To simulate possible ignitions in containers for liquid and solid acetylene, experiments have been done in steel tubes with electrical initiation. Both liquid and solid acetylene can produce an explosive effect under these conditions. The experimental difficulties are considerable owing to the effects on the electric discharge of the low temperature and the condensation of moisture. A study of the effects of pressure, temperature and energy of initiation is in hand.

In connection with the assessment of the hazards in the use of liquid mixtures, it is necessary to have more information on phase relations than is available in the literature. Accordingly an apparatus has been constructed for the determination of vapour pressures, dew points, etc., in various systems containing acetylene at temperatures ranging from its freezing point to ordinary temperature.

In experiments on decomposition in high-pressure vessels work has been continued with special emphasis on inhibition by  $\text{KC1}$ , which is the most promising substance examined. In six out of a series of seven experiments, using a bi-molecular layer, inhibition with  $\text{KC1}$  was satisfactory, the

maximum pressure found after firing being 900 psi., which is less than the test pressure of a commercial cylinder. Several rose only to 500 psi.

Some progress has been made with the investigation into the nature of the decomposition products formed both in commercial dissolved acetylene cylinders and in experimental apparatus. The substances which have been positively identified spectro-metrically are naphthalene, phenanthrene, pyrene and chrysene.

In addition there is good evidence for the presence of 1:2-benzpyrene and 1:2-benz-zanthracene. Final identification of the former depends on the production of an authentic specimen of the compound, which is being synthesised since it appears to be unobtainable. Separation of the latter from chrysene, which it closely resembles structurally, is difficult and chemical methods are being studied.

#### Pyrolysis Products

A survey of the products formed in the high-pressure porous mass experiments has shown that whatever the course of the decomposition and whether inhibitors are present or not, similar mixtures of polynuclear compounds are obtained. A similar product is also obtained from experiments on the pyrolysis of pure acetylene at 1 atmos. and 400° C. The application of the technique to cylinders involved in incidents has enabled positive statements to be made as to the possibility of decomposition having occurred.

Among studies of combustion kinetics of hydrocarbon mixtures are: a systematic study of acetylene/air mixtures over the explosive ranges at initial pressures of 1, 3 and 6 atmos.; explosion range investigation of acetylene/nitrogen mixtures; and the measurement of explosion pressures at velocities from 100 to 4,000 m. per sec.

At Bristol, the examination of the process of polymerisation of acetylene has shown an appreciable heat of adsorption on kieselguhr. A rise of several degrees from room temperature has been measured during this chemisorption, the products being mainly liquid with no permanent gas and no solids. The principal liquid product was benzene, the reaction being bi-molecular, and polymerisation was not apparently carried further under these conditions. It has, therefore, been suggested that the heat of adsorption (of the order of 50 k. cal. per

mole) would suffice to promote polymerisation. The three stages postulated are chemisorption, followed by surface polymerisation, and leading finally to polymerisation in the gas or liquid stages.

At Birmingham, work has been concentrated on the induction of polymerisation of acetylene at room temperature in the liquid phase by UV irradiation in order to find inhibitors which could then be tested at Woolwich on a larger scale and under pressure. So far initiation of polymerisation has presented the greatest difficulties.

Since polymerisation of acetylene is exothermic and conditions in a cylinder substantially adiabatic, it was considered that high temperatures of the order of 600° C. could be developed by polymerisation and at such temperatures it would be difficult to institute any control. The aim should therefore be to retard polymerisation at low temperature.

The reaction may proceed by ionic or free radical mechanism, and work has been concentrated on the latter. Initiation takes place in a small silica vessel, progress being followed by changes in a mercury manometer. Initiation by methyl and ethyl radicals from acetone and ethyl iodide was found to be unsuccessful; normal hexane was therefore used as solvent, with H<sub>2</sub>S irradiated by light of 2537Å (mercury line). The initial pressure of both gases was about 15 cm. Hg; the solid polymer left at the end of the reaction contained elementary sulphur.

It was found that the reaction could be inhibited by  $\beta$ -naphthylamine or *p*-phenylamine-diamine. Various solid and liquid organic sulphur compounds which would not be present in the gas phase but would produce SH or H radicals are being used in order to discover whether initiation is in the gas or liquid phase.

#### Fungicide Imports

Asked if he would give further consideration to facilitating the import of orthocide of SR 406 from North America in view of its success in the control of fungus diseases, Mr. Peter Thorneycroft, President of the Board of Trade, said in the House of Commons on 28 October that limited imports had been allowed for field trials. 'When these trials are completed, I shall be prepared to consider applications for licences to import,' he added.

# Increased Sales by Fisons

## But Taxation Still Too High Says Chairman

**I**N his annual report, the chairman of Fisons Ltd., Mr. F. G. C. Fison, says that the proportion of profits absorbed by taxation is still far too high. Sales for the year were £28,134,000, against £26,441,000 in the previous year. The consolidated profit of the group was £2,955,576, against £2,295,249. There was a notable increase in the contribution of the Chemical Division to this profit, but out of it £2,000,987 had to be provided for taxation.

Other points made by Mr. Fison were:—

‘Although the tonnage of fertilisers sold in the United Kingdom in 1953-54 was slightly lower than the tonnage sold in 1952-53, in terms of plant nutrient there was an increase due to the tendency to manufacture and sell more concentrated fertilisers. . . . We have well maintained our share of the market, due largely to the increased popularity of our high-grade compound fertilisers.’

### A Source of Pride

‘Although a substantial part of the increased profit was from our subsidiary interests, the fertiliser side also increased its profit as compared with last year. . . . The profitability of our business is a source of considerable pride to us because it has been achieved in the year under review in the face of very major difficulties. A number of important elements in our costs were substantially increased during the year, but we made no increases in our fertiliser prices, these increases in costs being more than absorbed by increased turnover due to active sales promotion, by greater efficiency in our factories and by compensating reductions in raw material costs which we managed to achieve. In the current year the increased costs, particularly in sulphate of ammonia, sulphuric acid and potash, have been so large that we have been obliged to make increases in our fertiliser prices. These by no means absorb the whole of the increased costs, and we have again relied on achieving some increase in turnover to maintain the level of profitability.’

‘International Fertilisers Limited, our associated company in Canada, had a very difficult year owing to the severe slump in

the potato market. . . . Another year of expanding trade was recorded by Fisons (Pty.) Limited, our associated company in South Africa, where the maize crop was an all-time record and wool farmers and sugar growers had excellent seasons. . . . In Rhodesia our associated company, Central African Fertilisers Limited, recorded a substantial increase in sales and profit.’

### Tunisian Company

Mr. Fison says that the company formed in Tunisia for the production of triple superphosphate under the name of Société Industrielle d'Acide Phosphorique et d'Engrais in which the principal partners were Compagnie des Phosphate et du Chemin de fer de Gafsa is now in production and technical difficulties are being overcome.

Referring to the board's acquisition of Pest Control Limited, he says that company sustained a loss in the three months trading period included in the present accounts but it was still the board's view that they had made an acquisition of the greatest value to the group and that it would not be long before it made a proper contribution to the profits.

Of the acquisition, with The Distillers Company Limited, of Murgatroyd's Salt and Chemical Company Limited, Mr. Fison says: ‘We have taken this step because, with our growing interests in the chemical industry, we thought it wise to ensure a supply of some of the basic chemicals.’

The future of Fisons Chemicals Limited is ‘not free from uncertainty,’ particularly in the fields of milk processing, ethical pharmaceuticals and pharmaceutical chemicals. ‘I referred last year to the Government's attempts to reduce the prices of products to the National Health Service and to the unfortunate effects which were likely to follow the Government policy as then known to us. I believe that the Government has shown itself to some extent receptive to the constructive criticism of the industry and there is now some hope that a scheme less damaging to the industry in general but safeguarding the essential interests of the Government may be adopted.’



## 121 Years of Progress

### The Story of Eaglescliffe

THE story of the Eaglescliffe Chemical Co. Ltd., Co. Durham, a concern which 'is growing younger and more vigorous year by year' is told in the November issue of the *Tees-side Journal of Commerce*.

The firm was founded in 1833 for the manufacture of sulphuric acid and fertilisers. In 1865 oil and cake mills were added; in 1890 an oleum plant, and in 1900, following the tremendous growth of coke ovens in the Middlesbrough area, the sulphuric acid plant was considerably extended. Early in the 1914-18 war there was a further expansion of sulphuric acid manufacture to meet the insistent demand for additional acid for making TNT.

Other developments were also taking place over this period—a purple ore briquette plant and a plant for the extraction of copper from the cupreous pyrites used in the sulphuric acid plant.

### Plants Added Quickly

In 1925 the demands of agriculture for fertilisers had grown to such a degree that a completely new fertiliser plant was laid down. Two years later a plant for the manufacture of dichromates was added, and in 1930 a plant was installed for the manufacture of zinc oxide. This was followed in 1933 by a plant for tin oxide production.

During the past 20 years the company has expanded more than during the previous 100 years, and during the past three years there has been further development by the amalgamation with E. P. Potter & Co. Ltd., of Bolton, and John & James White Ltd., of Glasgow. Eaglescliffe has now become the headquarters of the new combine known as British Chrome & Chemicals Limited, a London office has been acquired, and plans are in hand to increase the capital of the company before the end of the year to £1,400,000. Fully equipped new research laboratories have been laid down, and a further recent development has been the formation of a subsidiary company in Canada—British Chrome & Chemicals (Canada) Ltd.—with offices in Toronto.

The principal manufactures include sulphuric acid, which is produced mainly as raw material for other departments, and tin oxide, which is used by the ceramic industry. The other products of the group can be

divided into two main groups—dichromates and fertilisers. There has been a very rapid expansion in the range of fertilisers offered to agriculture during the last few years, and the company claims to have kept pace and now offers a range which ensures that they can supply a suitable fertiliser for every crop which is grown by the farmer.

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### Sulphuric Acid Plants

A NEW sulphuric acid and superphosphate plant at Cockle Creek, New South Wales, Australia, is expected to be in full production by December of this year. It will produce 100 tons of acid a day, and will cost £A1,000,000.

The constructing company, S. non-Carves (Australia) Pty. Ltd., is building a second, and larger plant at Birkenhead, South Australia. This £A2,000,000 plant is said to be the largest single converter sulphuric acid producing plant in the world. Both will burn pyrites, and use the vanadium catalyst method patented by Monsanto.

At Cockle Creek, rock phosphates from Nauru will be ground and treated with sulphuric acid to obtain superphosphate fertiliser.

Both plants will eliminate the necessity for using sulphur, which requires dollars to import. The pyrites which will replace it are usually discarded in the treatment of metal ores at certain Australian mines.

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### Corrosion Symposium

A SYMPOSIUM on 'The Protection of Structural Steel' organised by the Corrosion Group of the Society of Chemical Industry will be held in the lecture theatre of the Institution of Civil Engineers on 31 March and 1 April, 1955. The papers to be presented will include accounts of practical experience and research with protective coatings gathered from several countries. There will be contributions from France, Belgium, Holland, Sweden and the US, as well as Great Britain.

Non-members of the Corrosion Group who wish to receive a copy of the full notice of the meeting and a registration form, when it becomes available, are invited to apply to the Hon. Secretary, Mr. S. C. Britton, The Tin Research Institute, Fraser Road, Perivale, Greenford, Middlesex.



# Substantial German Export Gains

## IG-Farben Assets Return

THERE has been a further increase in chemical production in the Federal Republic since the holidays. The September index of 179.9 (1938 = 100) compares with 159.1 in the corresponding month of 1953, and outputs are expected to rise further, especially in sections profiting from growing demands for housebuilding such as paints and plastics. Chemical exports from West Germany remained stationary during August and September at the July level of DM.250,000,000. Shipments in January-September amounted to DM.2,200,000,000 against DM.2,325,000,000 in the whole of 1953. Although trade with the US has been somewhat less favourable of late, German chemical manufacturers expect the complete export figures for the current year to show a further substantial improvement.

Fertiliser sales have started well in the new agricultural year. July-September sales included 179,500 (1933: 109,500) tons (as N) of nitrogen fertilisers; 130,700 (122,800) tons (as  $P_2O_5$ ) of phosphates; and 209,100 (156,000) tons (as  $K_2O$ ) of potash salts. Compound fertiliser sales almost doubled. The potash mines also report a substantial increase in salt production to meet larger foreign orders.

### Plastics Developments

The West German plastics industry expects to reach an output of 310,000 tons this year, compared with 240,000 tons in 1953. About one quarter was used by plastics fabricators, one-fifth by paint and lacquer manufacturers and one-eighth by glue and adhesive makers. Some 7,000 tons are believed to be used by the photographic chemical industry. Special progress is anticipated for polyester products reinforced with glass fibres and for synthetic materials for fibre manufacture.

An important stage in the reorganisation of the West German chemical industry has been brought to an end by the acquisition by Farbwerke Höchst AG of 30 per cent of the DM.32,000,000 capital of Süddeutsche Kalkstickstoff-Werke AG, Trostberg, a company which produces about two-thirds of the total nitrogen and one-third of the calcium carbide output in the Federal

Republic. The shares now taken over by Farbwerke Höchst were formerly held by IG-Farbenindustrie.

Farbwerke Höchst AG are believed to be concerned in the recent purchase by a private group of the share capital of Anorgana GmbH, Gendorf, an IG-Farben subsidiary which was temporarily transferred to the Bavarian State, and hold IG-Farben's 49 per cent interest in Wacker-Chemie GmbH, Munich. The Höchst company has thus now interested itself in all the Bavarian factories of IG-Farben, except a photographic camera works at Munich, and thereby established for itself an important position in the fertiliser industry and in carbide chemistry.

### Improving Fuel Position

Badische Anilin- und Soda-Fabrik AG, Ludwigshafen, has taken several steps to improve its fuel and raw material position. The company has acquired a small financial interest in Gelsenkirchener Bergwerks AG, the largest coal producer in the Federal Republic; and it has joined Gewerkschaft Elwerath, a mineral oil and natural gas producer, in the formation of Rheingas Erdgasleitungen GmbH, a new company which will specialise in the construction and operation of natural gas pipelines. The latter company will lay a gas pipeline from the natural gas deposits at Stockstadt on Rhine and Eich near Worms to the BASF works at Ludwigshafen-Oppau. Last year BASF joined the German Shell subsidiary in forming a new company, Rheinische Olefinwerke GmbH, which is setting up a new plant at Wesseling for the treatment of oil cracking gases.

Farbenfabriken Bayer AG, Leverkusen, has concluded negotiations with the State-owned CORFO Corporation in Chile for the return of former IG-Farben assets in that country. Farbenfabriken Bayer AG will pay a sum of about 100,000,000 pesos, mostly in kind, and receive in return the assets and raw material stocks of the undertakings which have been operated by Industrias Quimicas Farmaceuticas CORFO since the war. Chilean patents and trade marks of Bayer, Merck, Höchst, Agfa, etc., are also to be returned.

A Working Group of Olefine Chemistry

has been formed at Essen by certain coal mining interests for the utilisation of the German manufacturing rights for metal alkyls by new processes and the use of these metal organic compounds for the production of olefine hydrocarbons. The processes in question were developed at the Max Planck Institute for Coal Research at Mülheim, and a licence has already been taken out by one of the big IG-Farben successors.

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## Petroleum Statistics

WORLD production of crude petroleum in 1953 totalled 4,772,000,000 barrels, an increase of 6 per cent over 1952. Despite the continued low-level production in Iran, the Middle East output, 902,000,000 barrels, topped the 1952 figure by 16 per cent. Production in Venezuela, 644,000,000 barrels, was down 3 per cent from 1952. Canada produced 81,000,000 barrels, a gain of 32 per cent. United States production of 2,360,000,000 barrels was up 3 per cent. Production in Indonesia totalled 75,000,000 barrels in 1953, an increase of 20 per cent. The USSR is estimated to have produced 370,000,000 barrels of crude in 1953, compared to an estimated 329,000,000 in 1952.

Among 1953 developments in the crude petroleum industry were major pipeline completions in Canada. The 718-mile Trans-Mountain line from Edmonton to the Vancouver area was completed late in the year. Also completed in late 1953 was the 645-mile extension of the Interprovincial line extending between Sarnia, Ontario, and Superior, Wisconsin.

Imports of crude into Western Europe in 1953 amounted to 578,000,000 barrels, an increase of 13 per cent. All the major importing countries increased their movements. In terms of percentage increases over 1952, the figures for these countries were: France, 5; Italy, 30; United Kingdom, 12. In 1953 approximately 95 per cent of the crude imported by Western Europe came from the Middle East, compared to 94 per cent in 1952.

Crude runs to stills, world total, amounted to 4,725,000,000 barrels in 1953, an increase of 7 per cent. Runs in Western Europe, reflecting the refining expansion programme in principal countries, totalled 601,000,000 barrels, a gain of 15 per cent. Percentage increases in runs in the United Kingdom and France were 14 and 6 respectively.

## Refinery Extension

HEAD Wrightson Processes Limited announce that the extension to the Weaste Refinery of Berry Wiggins & Co. Ltd. has been completed.

The original refinery installation, which has since been extended to meet the increased demand for the company's products, was built in the early 1930s. There was adequate tankage connected by pipelines to the jetty on the Manchester Ship Canal at which the ocean-going tankers bringing the crude oil could discharge, and coastal and other smaller craft load the refined oils.

The new extension steps up the capacity of the plant by 500 bbls. a day, and it was necessary to rearrange the layout of the original installation before provision could be made for the new units, because of the difficult nature of the ground and the restricted space available.

The reduction of refinery costs being a matter of great importance under present-day conditions, a number of the old units were re-designed and used for the new extension programme, thus saving considerably on capital outlay and raising the overall efficiency of the plant.

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## CIL Debenture Issue

PUBLIC offering of the recently projected issue of \$5,000,000 of sinking fund debentures of Canadian Industries (1954) Ltd. (THE CHEMICAL AGE, 1954, 71, 952) constituting the only present outstanding funded debt of the company, has been announced in Montreal by a syndicate headed by A. E. Ames & Co. Ltd. The offering price will be 100 plus accrued interest, and the coupon rate  $3\frac{1}{4}$  per cent.

Proceeds of the issue, along with an estimated \$26,500,000 from the offering of rights to shareholders to buy 1,434,891 additional shares, will be applied to finance expansion completed, under way or to be undertaken by C-I-L. The main items are repayment of an \$18,000,000 loan from Imperial Chemical Industries of Canada Ltd., the principal shareholder; purchase and completion of the Terylene plant at Millhaven, Ont., at a cost of \$22,000,000; and outlay of \$8,000,000 for extension of facilities at Cornwall, Beloeil, Brownsburg and Shawinigan Falls.

# Measurement of pH

## Pye Industrial pH Amplifier and Electrode Assemblies

IT can safely be said that the control of large-scale chemical and electrolytic processes by methods based on the measurement of pH of solutions is in its infancy in Britain. On the other side of the Atlantic there is scarcely a major process involving aqueous solutions in which valuable information for sampling or control is not obtained from the measurement of pH.

This method of control can often provide rich rewards, not only by elimination of trial and error methods, by avoiding waste of reagents or by extracting useful materials from effluents, but also by the information it can provide to enable new products to be made.

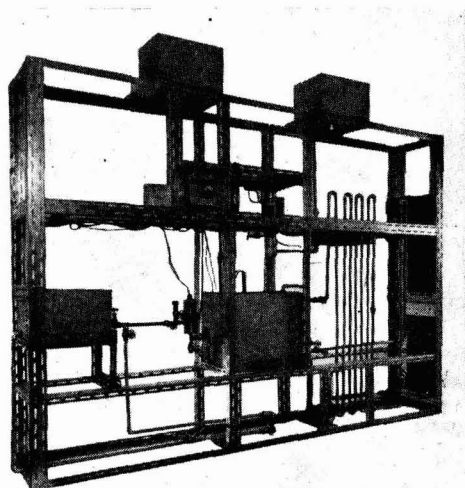
There are, however, very many problems associated with the technique; problems of viscosity, corrosion, flow, pressure, glass electrode attack and reference electrode poisoning. Many chemical firms are alive to the potentialities of control by measurement of pH values but, often owing to lack of information, they are obliged to use a laboratory method of measurement—which invariably leads to loss of valuable time.

At least one manufacturer of pH measuring equipment is fully aware of these problems and has devised a scheme by which they can be investigated. This firm has recently developed a pH amplifier, described later, and has also built a process simulator in which these large-scale factory problems can be studied in the laboratory.

### Construction of Simulator

The simulator comprises a closed circuit of piping which embraces a reaction tank, a delay line and a circulating pump; continuous flow and immersion type electrode assemblies can be inserted at strategic points. These electrode assemblies are connected to an electrode selector switch which, in turn, connects any one of the assemblies to the pH amplifier. The output from the amplifier is fed to a remote indicator/alarm relay, a recorder and a controller. The controller is linked with control valves which control the addition of suitable reagents contained in the tanks above them.

As described, the simulator is in its simplest form but, as it is built on a demountable framework and fitted with cocks at all



*The Pye process simulator for studying large-scale problems of pH measurement in the laboratory*

junctions, it is easily adaptable for use in tackling a wide variety of pH measurement problems.

The 'heart,' so to speak, of the simulator is the pH amplifier, which is used in conjunction with an electrode assembly of either the immersion or continuous-flow type. The immersion type assembly consists of a water-tight chamber through the base of which the glass and reference electrodes and the temperature compensator protrude into a perforated protector. The electrodes can easily and quickly be removed for cleaning, or replacement. The continuous-flow type electrode assembly incorporates similar electrode fittings to the immersion-type but the electrodes and temperature compensator are enclosed beneath their mounting plate in a 'Pyrex' glass flow chamber. This is resistant to a very large number of chemicals and has the great advantage of quick and easy replacement.

The firm concerned, W. G. Pye & Co. Ltd., 'Granta' Works, Newmarket Road, Cambridge, have produced leaflets describing their industrial pH measuring equipment and they will supply them on request.

## Beilby Awards

### Administrators Call for Applications

FROM the interest derived from invested capital of the Sir George Beilby Memorial Fund, at intervals to be determined by the administrators representing the Royal Institute of Chemistry, the Society of Chemical Industry and the Institute of Metals, awards are made to British investigators in science to mark appreciation of records of distinguished work. Preference is given to investigations relating to the special interests of Sir George Beilby, including problems connected with fuel economy, chemical engineering and metallurgy, and awards are made not on the result of any competition, but in recognition of continuous work of exceptional merit, bearing evidence of distinct advancement in science and practice.

In general, awards are not applicable to workers of established repute, but are granted as an encouragement to younger men who have done original independent work of exceptional merit over a period of years.

### 1953 Award Withheld

The administrators are empowered to make more than one award in a given year if work of sufficient merit by several candidates is brought to their notice. For 1952, one award of one hundred and fifty guineas was made to Mr. T. V. Arden. For 1953, however, there was no award because, although the administrators were impressed by the promise shown by several of the candidates, they concluded that none of them adequately fulfilled the conditions.

Consideration will be given to the making of an award or awards from the Fund early in 1955. Outstanding work of the nature indicated may be brought to the notice of the administrators, either by persons who desire to recommend the candidate or by the candidate himself, not later than 31 December, by letter addressed to The Convenor of the Administrators, Sir George Beilby Memorial Fund, Royal Institute of Chemistry, 30 Russell Square, London W.C.1.

The letter should be accompanied by nine copies of a short statement on the candidate's career (date of birth, education and experience, degrees and other qualifications, special awards, etc., with dates) and of a list of references to papers published by the candidate, independently or jointly.

## Sadler Reorganisation

SADLER and Company Limited announce that they are placing before their shareholders proposals involving the transfer of activities to four new wholly-owned operating companies. The names of the companies are: Sadler & Company (Coke Ovens) Limited (to take over the coke ovens at Evenwood, Co. Durham, together with ancillary plant and other assets); North Eastern Tar Distillers (Sadlers) Limited (to take over the tar distilling plant and ancillary departments at Middlesbrough, together with the carbolic acid production department. This company will also take over the transport and maintenance departments, which it will operate for benefit of the group); Sadler & Company (Chemicals) Limited (to take over the acid and chemical production department at Middlesbrough); Sadler & Company (Storage) Limited (to take over the creosote storage installation and benzole bonded depot).

If the proposals are approved at a meeting of shareholders on 7 December, the transfer will be effected on 1 January, 1955. The new arrangements are purely a matter of internal reorganisation and do not involve any change in the ultimate ownership or in the management or conduct of the business of the company.

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## Tungsten in Steel

THE British Standards Institution has recently published 'Methods for the Analysis of Iron and Steel, Part 32: Absorptiometric Determination of Tungsten in Steel' (BS. 1121: 1954). The method specified is applicable to steels containing up to 3 per cent of tungsten, although it may be modified to deal with higher tungsten content.

The principle of the method is solution of the sample in phosphoric-sulphuric acid, reduction of the ferric salt by stannous chloride, the formation of a thiocyanate complex of tungsten, completion of the reduction by titanous chloride, and photometric measurement of the resultant yellow colour due to tungsten. The method is based on research work undertaken by the British Iron and Steel Research Association.

Copies of the above standard may be obtained from the British Standards Institution, Sales Branch, 2 Park Street, London W.1. Price 2s.



**CHEMICAL THERMODYNAMICS.** By I. Prigogine and R. Defay. Translated and revised by D. H. Everett. Longmans, Green & Co., London, 1954. Pp. 543 + xxxiii 63s.

In most treatments of chemical thermodynamics consideration is largely restricted to the study of equilibrium states and reversible changes in spite of the fact that quantities such as the heat of reaction only have a precise meaning if the system considered actually undergoes a chemical reaction in a finite time. Thermodynamics of chemical reactions should be those of irreversible, rather than reversible, phenomena. De Donder showed that this difficulty could be resolved by calculation of the entropy production resulting from a reaction and introduced a new function of state, the affinity, characteristic of the reaction and closely related to its irreversibility. This approach is based on the classical methods of Gibbs, but recognises the irreversible character of physico-chemical changes. Processes are considered in terms of entropy production, which is evaluated by introduction of the concepts of affinity and extent of change.

This book, a translation of the 1950 edition of 'Thermodynamique Chimique' by Prigogine and Defay, is the first full account in English of the principles and methods used by De Donder and his school. It has been revised to include work up to 1951 and brought up to date by an appendix dealing briefly with developments up to July 1953. As an aid to the use of the De Donder thermodynamics the notation of the French edition has been modified to bring it into more accordance with current conventions.

Throughout the book emphasis is placed on general theorems applicable to systems of any number of phases and components and in which chemical reactions can occur, providing a basis for studies of more complex phenomena. While the book is

essentially one for the graduate chemist or research worker interested in thermodynamics, the first third provides a good introduction to the subject. Thermodynamic variables are defined, the concepts of conservation of energy and creation of entropy introduced, affinity and its relationships with other thermodynamic functions discussed and average affinity considered. Ideal and reference systems, standard affinities and the Nernst heat theorem are also considered in the earlier chapters. The thermodynamics of perfect and real gases, liquids and solids, the Phase Rule, phase changes, thermal stability and critical phenomena are then discussed and the consequences of perturbing systems from equilibrium to non-equilibrium or final equilibrium states.

Much of the remainder of the book is concerned with the thermodynamics of solutions. Authors and translator have all made significant contributions to this branch of thermodynamics and the treatment provides a good account of modern views. Fundamental properties of solutions, solution-vapour and solution-crystal equilibria, including mixed crystals, eutectics, solubility and addition compounds, thermodynamic excess functions, regular, athermal, associated and electrolytic solutions are discussed in a lucid and stimulating way. There is a useful chapter on azeotropes and a final one on indifferent states.

There are many applications of results to simple systems by means of references to experimental data. The book contains a large number of clear diagrams and many references. While it is primarily of interest to the advanced worker, the earlier chapters and, as the translator points out, much of the later ones may be read by the honours degree student. The research chemist or chemical engineer concerned with the thermodynamic treatment of physical and chemical processes and the thermodynamics of solutions will find a great deal to interest and stimulate in this book.—W. R. MOORE.



LEHRBUCH DER PHYSIOLOGISCHEN CHEMIE.  
By S. Edlbacher and F. Leuthardt. 11th  
Edition. Walter de Gruyter & Co.,  
Berlin. 1954. Pp. xvi + 813. Cloth,  
DM. 42.

'Physiological chemistry is such a heap of disconnected facts that there seems to be little point in adding further oddments.' These words were written in 1874 by the Swiss physiologist Miescher. Since then the subject has advanced rapidly and new techniques, such as the use of isotopic tracers, have enabled the biochemist to fit metabolic processes into a logically satisfying scheme. The despair expressed by Miescher has been dispelled and the 'heap of disconnected facts' is being built up into an ordered structure.

However, there are still only relatively few textbooks of physiological chemistry which provide more than a classified catalogue of fact and theory. Professor Leuthardt completely redesigned this well established 'Lehrbuch' when he produced the 10th edition in 1952, and he is to be congratulated on the brilliant way in which he has presented the subject as an organic whole. This has been achieved by placing the fundamental biochemical reactions in the foreground, all other phenomena being considered in relation to these whenever possible. It is clear that many otherwise isolated facts can be brought together in this way. The present edition, which contains much new material, follows the same plan.

The book opens with a concise survey of natural products, followed by a brief account of important physicochemical concepts. The next two sections discuss metabolic processes, first in a general way (294 pages) and then by consideration of individual organs and tissues (132 pages). Another section deals with the chemical regulation of physiological processes and there are also three chapters on different aspects of nutrition. References to monographs and reviews are given in an appendix, and a number of references to recent papers (including many in 1953 and some in 1954) will be found in the text. However these are scattered somewhat sporadically and a more systematic approach to references would be desirable. Printing and binding are good, although there are distressing misprints in some of the formulae.

The reviewer was fascinated by Professor Leuthardt's lucid and elegant exposi-

tions of complicated problems, and by the way in which he avoids the glib oversimplification which mars so many textbooks of biochemistry. English readers will be grateful to him for his straightforward German style. The book is thoroughly up to date and can be strongly recommended.  
—P. SCHWARZ.

STATISTICAL THEORY OF EXTREME VALUES & PRACTICAL APPLICATIONS. By E. J. Gumbel. National Bureau of Standards. Applied Mathematics Series 33. US Government Printing Office, Washington. 1954. Pp. 51. \$0.40.

This brief monograph is based upon four lectures given by the author at the National Bureau of Standards. It is a concise and lucid exposition of the available statistical methods for dealing with extremes occurring in samples of given size and illustrates these methods by a number of diverse practical examples. A fair knowledge of ordinary statistics is assumed.

The theory is particularly valuable when considering the quality control of a product in which lifetime is a vital factor and it is clear that the length of time during which tests are required can be much reduced by application of the theory of minima. Among its many other uses may be mentioned estimates of the breaking strengths of materials (e.g. yarn), which can be obtained more economically by using the statistical theory of extremes in the planning of necessary experiments.—A. DALGARNO.

GLASS REINFORCED PLASTICS. Edited by Phillip Morgan. Iliffe & Sons Ltd., London. 1954. Pp. vii + 248. 35s.

Since their use in aircraft during the war, the scope of glass reinforced plastics has increased considerably, and they are now employed in a number of industries—particularly in boat-building and in car bodywork. This book is the first attempt to cover the whole subject from the materials and processes used to the properties and applications of the products. It is well illustrated and attractively produced.

There are 15 contributors and, since the field they cover is a large one, each chapter is largely self-contained. In fact, as the editor points out, 'it is not expected that all readers will study all parts of the book.'—A.N.W.



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# HOME

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## Sulphur Pollution

Even with smokeless zones, sulphur gases remain to pollute the atmosphere, Mr. George H. Walker (Lancashire county analyst) states in his annual report for 1953. During the year his department continued their work on the measurement of atmospheric contamination in Preston and Leigh, part of a nation-wide investigation co-ordinated by the DSIR.

## Man-Made Fibres

By the end of this year British capacity for production of man-made fibres other than wool will amount to about 48,000,000 lb. annually, according to *The Financial Times*. During 1955 output will increase still further, and by 1956 capacity should reach about 75,000,000 lb. a year.

## Polymers Lecture

A special meeting of the Plastics and Polymer Group of the Society of Chemical Industry is to be held on 7 December at the Chemical Society's Rooms, Burlington House, Piccadilly. Professor P. J. Flory, Ph.D., will read a paper entitled 'The Structure and Properties of Polymers.'

## Site Inquiry

At the meeting at Middlesbrough of the Tees-side Industrial Development Board, it was reported that an inquiry about an industrial site had been received from a chemical firm, but in view of its requirements, it was not expected that the scheme would materialise. Mr. F. R. Shaw (Chairman of the Industrial and Services Committee) said the firm needed 500,000 to 1,000,000 gallons of water daily and about 1,000,000 to 1,500,000 gallons of noxious effluent would have to be sent through four miles of piping daily to the sea. This effluent was so strong that within four years it would eat through cast-iron pipes.

## QVF Selling Agents for Yugoslavia

QVF Limited, of Stone (Staffs.), who market the 'Visible Flow' glass pipeline manufactured by James A. Jobling & Co. Ltd., and the 'Quickfit' industrial plant in glass of Quickfit & Quartz Ltd., announce that they have appointed Guest Industrials Ltd. of 81 Gracechurch Street, London E.C., to be their selling agents in Yugoslavia.

## Trade Arrangement

A trade arrangement signed between the Polish and British Governments on 11 November provides for the issue this year and, where necessary, the extension into 1955, of import licences for about £1,000,000 worth of Polish goods, including chemicals. Supplementary negotiations will begin soon about trade in 1955.

## Tretol Move

After 15 years of steady expansion Tretol Limited, manufacturers of specialised paints and building products, have moved into a spacious, two-storey modern office at The Hyde, London N.W.9. An interesting feature of this building is that no steel was used in the construction and it was possible by this method to reduce the building time.

## BCMA Dinner

The British Colour Makers' Association held its 5th Annual Dinner at the May Fair Hotel, London, on 3 November, the retiring chairman of the association, Mr. A. S. Callaghan (Imperial Chemical Industries, Ltd., Dyestuffs Division), presiding. There were 42 representatives of members and staff of the association. The principal guest was Prof. R. P. Linstead, C.B.E., M.A. (Hav.), Ph.D., D.Sc., A.R.C.S., F.R.I.C., F.R.S., Dean of the Royal College of Science.

## New A.M.I.Chem.E. Syllabus

The Institution of Chemical Engineers has recently published new 'Regulations for the Admission of Student, Graduate, and Corporate Members, and for the Examination of the Institution. These regulations contain the syllabuses for the examination which is to be held for the first time in 1956 (see *THE CHEMICAL AGE*, 1954, 71, 232). The preliminary or Part 1 of the new examination will, however, also be held in 1955 immediately before the last examination in Papers C, D, E, and F of the present examination as described in the Institution's pamphlet 'Hints to Candidates'. The closing date for entry to both the present and new examination is 1 June in each year. Further particulars may be obtained from the General Secretary, The Institution of Chemical Engineers, 56 Victoria Street, London S.W.1.

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# OVERSEAS

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## German Price Increase

Prices for newsprint and chemical pulp in West Germany are to be raised because of a shortage of timber. Chemical pulp will go up by 7 per cent as from 1 January next year.

## Canadian Mineral Output

Nine of Canada's 16 leading minerals were produced in greater quantity in the first six months this year than in the first half of 1953, the Canadian Dominion Bureau of Statistics reports. Petroleum and natural gas output continued to soar, but for most other minerals changes from last year were moderate to slight.

## Record Superphosphate Output

Production of superphosphates in the Fertilisers and Chemicals Company of Israel reached an all-time high during September, and totalled over 8,000 tons. The company produced a total of 52,512 tons of superphosphates in the first nine months of the year, a monthly average of about 5,835 tons. Production during the corresponding period last year amounted to only 15,813 tons, or about 1,757 tons per month.

## More Chemicals

The Economic Commission for Europe (ECE) of the United Nations reports that the most striking increase during the last year has been in the output of chemicals which in almost every Western European country rose considerably more than industrial production as a whole. This was the continuation of a tendency which was apparent also in the preceding years.

## US Coal Chemicals

Figures reported by oven-coke plant operators to the Bureau of Mines, US Department of the Interior, show that production of 12 coal chemicals increased during September, compared with the previous month, and production of another 12 went down. Biggest proportionate increase (128.3 per cent) was in refined light solvent naphtha, and the biggest decrease (30.3 per cent) was in crude coal tar not distilled or topped or used as fuel. Production of coke decreased slightly due to the shorter working month; daily average production was 3 per cent higher.

## Copper Production Down

Production of the Anaconda and Kennecott copper mines in Chile in the first ten months of the year totalled 250,803 metric tons, compared with 287,925 metric tons in the same period of 1953.

## Mexican Fertiliser Project

A US chemical manufacturing firm, it is reported, is to invest \$50,000,000 in the establishment of three new fertiliser plants in Mexico. The largest may be built near Coatzacoalcas, in the Tehuantepec peninsula, and two plants of smaller capacity are said to be planned for the Chiapas (north-east) and Sonora (north-west) areas.

## CIL Plant Expansion

Facilities at Cornwall works of Canadian Industries (1954) Ltd. are to be expanded to provide three times the present output of caustic soda and chlorine. Construction of the extension will begin early in 1955, and will be completed within a year. The expansion will be closely integrated with present operations and will provide employment for an additional 50 people.

## Coal Chemicals Impractical

The New Zealand Minister of Mines, the Hon. W. Sullivan, in a recent statement, said that the production of synthetic chemicals from coal was not a practical proposition for New Zealand because the market for coke was not big enough. An alternative method, he said, would be to produce chemicals for converting coal gases to plastics, but New Zealand coal reserves were not sufficient to provide the raw materials on an economic scale.

## Australian Oil Refineries

Australia is expected to save £A27,000,000 a year in imports of petroleum and petroleum products when her present refinery construction programme is complete. Four new refineries involving a capital expenditure of more than £A100,000,000 are now being built at strategic points in New South Wales, Victoria and Western Australia, and they should be processing 8,000,000 tons of crude oil a year by the middle of next year, sufficient to meet most of Australia's requirements for refined petroleum products.

## PERSONAL

MR. K. H. ROWLAND has been appointed assistant works manager of Carbide & Carbon Chemicals Company, a Division of Union Carbide and Carbon Corporation. Mr. Rowland joined



Carbide's South Charleston, W. Va., plant as a chemical engineer in 1934, after his graduation from the University of Michigan, where he received the degree of Bachelor of Science in Chemical Engineering. He became, progressively, production area supervisor in 1940, chemical production super-

visor in 1944, and then was transferred to the Institute, W. Va., plant in 1947 where he was assistant superintendent. In 1952 he returned to South Charleston as superintendent of chemicals and resins and in 1953 was made general superintendent of the plant.

MR. J. DEAN, secretary of APV-Paramount Limited, the foundry subsidiary of The APV Company Limited at Crawley, Sussex, has been appointed a director of the company as from 1 November.

At its meeting on 10 November the Grand Council of the Federation of British Industries elected SIR GRAHAM HAYMAN, Kt., as deputy president. Sir Graham, who received his knighthood at the beginning of this year, is chairman of the management committee of the Distillers Company Ltd. He has been a director of the company since 1936 and was for some years chairman of its industrial executive committee, in which capacity he was particularly concerned with the company's activities in the chemical and plastics field. He is also a director of several other companies, including BX Plastics Ltd. and the United Glass Bottle Company Ltd., and chairman of the British Tyre & Rubber Company Ltd. From October 1950 to October 1953, Sir Graham was chairman of the Association of British Chemical Manufacturers, of which he is now a vice-president.

As the result of the annual general meeting of the British Colour Makers' Association held on 3 November the following will be the officers and council for the ensuing year: *Chairman*, MR. J. H. GRIMSHAW (Horace Cory & Co. Ltd.); *Vice-chairman*, MR. H. GOSLING (Cornbrook Chemical Co. Ltd.); *Honorary Treasurer*, MR. C. G. A. COWAN (Cowan Bros. [Stratford] Ltd.); *Council*, MR. C. M. BEAVIS (Golden Valley Colours Ltd.), MR. A. S. CALLAGHAN (Imperial Chemical Industries Ltd., Dyestuffs Division), MR. C. G. A. COWAN (Cowan Bros. [Stratford] Ltd.), MR. H. GOSLING (Cornbrook Chemical Co. Ltd.), MR. J. H. GRIMSHAW (Horace Cory & Co. Ltd.), MR. V. WATSON (Cromford Colour Co. Ltd.), MR. A. H. WHITAKER (James Anderson & Co. [Colours] Ltd.), MR. H. A. WILSON (The Derby-Oxide & Colour Co. Ltd.), MR. C. E. YOUNG (Hardman & Holden Ltd.); *Secretary*, MR. ALLAN J. HOLDEN, B.Sc., F.R.I.C.

Rhodes, Brydon & Youatt Ltd., centrifugal pump manufacturers, of Stockport, Cheshire, announce that MR. W. LATTA, sales manager, has been appointed a director of the company.

Appointed managing director of the Geigy Co. Ltd. as from 28 October was MR. HAROLD CLAYTON. His early years were spent in the textile printing industry, which



he forsook for the Geigy Colour Co. Ltd. in 1924. This company he developed through the formation of James Anderson (Colours) Ltd., of which he is a founder director. His career in Geigy has been via area manager, sales director, and joint managing director (with the

late Mr. F. L. Goodall). He was concerned in the founding of the Junior Section of the Society of Dyers and Colourists, and was the first secretary, and afterwards chairman, of the Manchester section of OCCA.

Glaxo Laboratories Ltd., announce that SIR MAURICE I. HUTTON, C.M.G., will relinquish executive duties as a director of the company on 31 December 1954 and will resign from the board on 30 June 1955 in order to become managing director of The Anglo-Australian Corporation (Pty.) Ltd., Melbourne. Sir Maurice Hutton joined Glaxo Laboratories Ltd. in January 1949. He had been head of the British Food Mission in the USA from 1944.

DR. R. B. STRATHDEE, O.B.E., T.D., B.Sc., M.A., Ph.D., F.R.I.C., Reader in Chemistry at Aberdeen University, has been appointed chairman of the Joint Committee of the Scottish Education Department of the Royal Institute of Chemistry for the award of National Certificates in Chemistry and Applied Chemistry. He succeeds PROFESSOR J. W. COOK, who is now Principal of the University College of the South West, Exeter.

One of the youngest women to qualify for the Fellowship of the Royal Institute of Chemistry is 29-year-old OLIVE L. DRAGE, B.Sc. Miss Drage, who recently qualified in Branch E (see THE CHEMICAL AGE, 1954, 71, 945) thus becomes one of only 15 women who have been awarded Fellowships in this branch. She has been engaged in analytical research in the Control Division of Crookes Laboratories for five years, and pursued her studies at evening classes at Chelsea Polytechnic.

COLONEL F. W. JONES and MR. C. D. O'SULLIVAN have been re-appointed president and vice-president respectively for the year 1954-55 of the Society of British Paint Manufacturers. The five vacancies on the council were filled by the election of MR. T. S. DALLY (Pinchin, Johnson and Associates), MR. J. P. HALPIN (Lewis Berger [Great Britain]), MR. C. A. F. HASTLOW (Docker Bros.), MR. H. LEIGH (W. and J. Leigh) and MR. C. R. PETRIE (International Paints).

A note appeared in these pages last week (p. 1047) on the appointment of MR. W. H. STEVENS as UK technical consultant of the 'Thiokol Chemical Corporation'. This should, of course, have read Thiokol Chemical Corporation, of Trenton, New Jersey. We apologise for the error.

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### Obituary

The death has occurred at the age of

80 of MR. FREDERICK GEORGE ORME, O.B.E., F.C.I.S., who started his career with the former National Explosives Co. Ltd. He spent 18 years with the company, ten of them as secretary. In 1916 he became an Assistant Inspector and from 1917-19 was Inspector of High Explosives at the Royal Arsenal, Woolwich. He then joined the firm of James Powell and Sons (Whitefriars) Ltd., glass and stained glass manufacturers, and served on the board for 33 years, retiring in 1952.

Founder of the chemicals and dyestuffs firm of Brown & Forth Limited, Euston Road, London, MR. JOHN BROWN, senior, died on 9 November in his 84th year. He founded the company as a young man in 1890, and when it became a private limited company in 1920 became chairman of the directors. He retained this position until this year, when he was succeeded by his son, Mr. John W. Brown, M.A.

The death occurred on 11 November of MR. VICTOR H. STOTT, managing director of Matthew Wells & Co. Ltd., oil refiners and distillers. He was president of the Manchester and District Lubricating Oil & Grease Association and past president of the National Lubricating Oil & Grease Federation.

We announce with regret the death on 7 November of DR. OTTO OBERLÄNDER, Ph.D., F.R.I.C. One of his former colleagues writes this appreciation: Dr. Oberländer was a consulting and forensic chemist of the first rank; fifty years of experience, a vivid personality and wise counsel won him the respect and affectionate regard of the bench and bar and that of his clients at home and abroad. Oberländer was a pioneer in the development of the osmium, drawn tungsten wire, gas-filled and fluorescent lamp industry. In association with leading patent law counsel such as Sir Stafford Cripps, James Whitehead and Trevor Watson he gave fearless expert evidence in many vital and complicated cases including also those relating to the synthetic fibre, dyestuffs and plastics industries. His research laboratories and exceptionally fine library gave valuable support to his expert and painstaking assessment of the most complicated issues. Oberländer was a good and unselfish friend and he will be particularly missed by very many whom he helped in their careers.

# Publications & Announcements

MEASUREMENT of the concentration of dissolved oxygen in a river gives a good indication of the state of pollution of the water. This is because organic polluting matter is oxidised by micro-organisms, so taking up oxygen and reducing the concentration in solution. In the usual method for determining dissolved oxygen in a stream samples are taken by hand. The level of oxygenation in a river, however, may fluctuate widely and rapidly and there is therefore a need for some equipment which will determine this level either continuously or at frequent intervals. An instrument which has been developed by DSIR takes samples of water automatically at ten-minute intervals and applies to them the Winkler method of analysis. When this method is used manually the amount of iodine present is determined by titration with a standard solution of thiosulphate but in the automatic apparatus the colour of the iodine solution is measured by a photo-electric cell, and the result is recorded on a chart. The new instrument was shown on the Department's Stand (No. 174), at the Public Works Exhibition at Olympia this week (15-20 November).

\* \* \*

AGARD (Advisory Group for Aeronautical Research and Development) a NATO group, held a series of meetings at Scheveningen during the week of 3 May. Four reports presented at these meetings have been published, the first having been noted in our issue of 11 September (p. 543). The other three are now available from the Ministry of Supply, TPA3/TIB, Room 009B, First Avenue House, High Holborn, London W.C.1, their titles being: 'Formation et Depot de Carbone dans les Foyers de Turbo-Machines d'Aviation,' by C. Foure; 'Some Aspects of Combustion of Liquid Fuel,' by C. C. Graves and M. Gerstein; and 'The Mechanism of Carbon Formation,' by G. Porter.

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THE October issue of *The Houdry Pioneer*, published by Houdry Process Corporation of Philadelphia, Penn., US, 'in the interest of greater efficiency in catalytic operations' consists of an article called 'High Conversion can be Profitable,' by H. D. Noll and

D. E. Norris. It is a description of both thermal and catalytic cracking operations or combinations of them for heavy oil.

\* \* \*

CHEMICAL and allied industries use great quantities of water, and there is always a risk, on very exposed sites, that water supplies may be cut off by freezing of the mains. A device known as the Radford Defroster, made by Radford Electronics Ltd., 149 Newfoundland Road, Bristol 2, has been designed for such an eventuality. It comprises a step-down transformer which can be run from any AC supply, and two heavy-duty cables which are attached to the frozen pipe on either side of the ice plug. The current is allowed to flow until the pipe is functioning normally and operation is completely foolproof since the low voltage applied is completely harmless. The capacity of the apparatus is 2 kW, sufficient to melt ice in a  $\frac{1}{2}$  in. pipe at over 9 ft. per min. Although primarily designed for use on water pipes the defroster should also be useful for compressed air and carbon dioxide lines.

\* \* \*

ENTIRELY new boilerhouse instrument is the 'Econometer' made by Kelvin & Hughes (Industrial) Ltd., 2 Caxton Street, London S.W.1. This is an instrument for indicating whether the working flue gas heat loss is greater or less than a predetermined set figure by a varying band of colour. The instrument employs an optical indicating system whereby shadow or coloured bands are projected on to a ground glass scale. Four translucent strips are used, three being vertical and parallel and the fourth horizontal at the upper end of the scale. The two outer vertical strips are used for indication of flue gas temperature and percentage CO<sub>2</sub> content by means of dark shadows. A dark shadow is also observed on the centre strip when the installation is operating at the predetermined figure of percentage heat loss. If this loss is greater, a red band is observed at the upper end of the shadow; if the loss is less, a green band is seen at the upper end of the shadow. The horizontal strip is only illuminated when CO + H<sub>2</sub> is present, and half-illumination of this strip represents 0.5 per cent, beyond which reasonable economy cannot be maintained.



# Law & Company News

## Commercial Intelligence

The following are taken from the printed reports, but we cannot be responsible for errors that may occur.

### Mortgages & Charges

(Note.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described herein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every company shall, in making its Annual Summary, specify the total amount of debt due from the company in respect of all Mortgages or Charges. The following Mortgages or Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an \*—followed by the date of the Summary but such total may have been reduced.)

**MARCHON PRODUCTS LTD.**, London W. chemical manufacturers. — 12 October, £600,000 debenture stock secured by a Trust Deed dated 5 October, 1954; charged on specified properties and shares and a general charge. \*£251,600. 5 July, 1954.

**PLATOVAC LTD.**, Birmingham, plastic manufacturers.—12 October, £1,350 debenture to Zansdale Financial Holdings Ltd.; general charge.

### Change of Address

The address of the Newcastle office of London Metal Warehouses has been changed to 25 Collingwood Street. Tel.: Newcastle 24244.

## New Registrations

### Scientific Formulation Ltd.

Private company. (538,952.) Capital £500. Manufacturers of and dealers in chemicals, gases, drugs, medicines, cosmetics, etc. The subscribers are:—Florence M. Ross and Wm. Johnston. Florence M. Ross is the first director. Reg. office: 60 Brewery Road, London, N.7.

### Lederle Ltd.

Private company. (538,940.) Capital £100. To manufacture, buy, sell, mine, refine, produce, import, export and deal in drugs, medicines, medical and pharmaceutical products, chemicals and chemical products, producers of medical and pharmaceutical products, chemical manufacturers, mining, electrical and other power producers, fuel manufacturers, oil finers and manufacturers, etc. Directors: Raymond E. Lapean, Owen N. Williams and Horace C. Plevin.

### Pest Control (Ireland) Ltd.

Private company. (15,207.) Registered in Dublin. Capital £100. Chemists, druggists, drysalterers, etc. Subscribers (each with one share): Godfrey M. Goodbody and George N. Snarey. The first directors are not named.

### Phytoguard Ltd.

Private company. (538,528.) Capital £100. To carry on the business of buyers, sellers and manufacturers of and dealers in all types of insecticides, germinicides, larvicides, fungicides and other like preparations for use in connection with the prevention and destruction of pests, weeds, and plant diseases, etc. The directors are Walter L. Mawby and Lily M. M. Mawby. Secretary: A. C. Lee. Reg. office: 68½ Upper Thames Street, E.C.4.

## Company News

### Donald Macpherson & Co. Ltd.

Donald Macpherson and Co. Ltd., manufacturers of protective paints, varnishes and lacquers, have acquired all the share capital of R. Cruickshank (Cellulose), paint and lacquer manufacturers of West Bromwich. The latter company will retain its identity and carry on its business as in the past.

### Vitamins Ltd.

Group trading profit of Vitamins Ltd. for 1953-54 reached the record figure of £87,123, against £63,451 the previous year. In spite of the increase in profits, the dividend remains the same.

### Dorman Long & Co. Ltd.

Lists opened on 18 November for the 15,000,000 £1 ordinary shares in Dorman Long & Co. Ltd., the fifth of the major steel companies to be sold back to the public. They are being offered at 22s. 6d. to yield 7.1 per cent on the forecast effective dividend of 8 per cent. The prospectus of the offer of sale by the Iron and Steel Holding and Realisation Agency was published on 15 November. The group embarked on an extensive development programme in 1945, and it should be completed by 1957.

### Midland Tar Distillers

Midland Tar Distillers recommend a

*[continued on page 1108]*



# MEEHANITE

## Iron Castings

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*Quick delivery can  
be given for LOAM  
MOULDED CASTINGS*

*up to 15 tons in Weight  
and up to 13 feet diameter*

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**ASHMORE, BENSON,  
PEASE & CO.**

(Proprietors: The Power-Gas Corporation Ltd.)

STOCKTON-ON-TEES



dividend of 10 per cent less tax on the £1,250,000 ordinary capital for the year ended 30 June. This compares with 8 per cent paid annually for the past eight years. Net profits of the group for the year have increased from £126,821 to £142,726. The annual meeting is to be on 17 December.

#### **Evans Medical Supplies Ltd.**

The directors of Evans Medical Supplies Ltd. have declared an interim dividend on the ordinary stock of 1½d. per 5s. stock unit, less tax, on account of the year ending 31 December 1954 (same).

#### **Petrochemicals Ltd.**

A 'considerable improvement' in the position of Petrochemicals Ltd. is reported in the annual statement of the chairman, Mr. G. H. Owtram. The company's research committee is venturing in 'a direction which may have far-reaching and beneficial results,' and considerable expansion has taken place during the year in the rarer and higher-priced products made by the firm. Trading profit for the group was £793,345, against £170,660, and after deductions there was a surplus of £127,699, compared with a deficiency of £439,794. Interest payments and other charges, however, leave a group loss attributable to the parent company after taxation of £319,263 (£858,286). The meeting is to be on 2 December.

#### **The International Nickel Co. of Canada Ltd.**

The interim report of the International Nickel Company of Canada Ltd. and subsidiaries for the period ended 30 September shows net earnings in terms of US currency of \$14,844,376 for the third quarter and \$47,430,561 for the nine months, after all charges, depreciation, depletion, taxes, etc. Net sales for the third quarter of 1954 were \$84,451,253, against \$89,946,751 for the second quarter. Net sales for the nine months ended 30 September were \$262,655,664, compared with \$254,950,475 for the corresponding period of 1953.

### **Glaxo Profits Down**

CONTRACTS now being placed for further expansion in this country by Glaxo Laboratories Ltd. will, it is estimated, cost not less than £600,000, says the chairman, Sir Harry Jephcott, in his annual report. Work will begin on the new projects early in 1955, and in addition further overseas manufacturing units may need to be developed.

To maintain their position in the industry involves the expenditure of large sums on research, he goes on. Annual research expenditure is increasing, a tendency he expects to continue—'It is indeed the price of survival.'

The firm will shortly make available cortisone manufactured by an entirely new synthetic process which involves no payment in any foreign currency for raw materials or other services.

Sales during the year increased in volume by a little more than 10 per cent, but because of increasing competition receipts were down by nearly 7 per cent. Group trading profits of £2,922,929 compare with £3,071,367, and net profit after taxation is £1,484,189, against £1,585,025.

## **Market Reports**

LONDON.—Steady conditions characterise most sections of the industrial chemicals market. There has been a fair volume of inquiry for the routine soda and potash products and the price position is unchanged. In other directions the undertone is firm with formaldehyde, hydrogen peroxide, arsenic and the barium compounds in steady request. Export buying interest remains good, although movements have been hampered by the dock labour situation. Business in fine chemicals is quietly steady, and no changes have been reported from the coal tar products market.

MANCHESTER.—A fair number of new inquiries covering a wide range of products has been reported on the Manchester chemical market during the past week and new business is coming forward on quietly steady lines. Most industrial users in Lancashire and the West Riding are calling for reasonably steady deliveries under contracts, and export movement has been maintained at about its recent level. Prices generally are on a steady to firm basis. Moderate buying interest is being shown in fertiliser materials, and most of the light and heavy by-products are finding a ready outlet.

GLASGOW.—During the past week business has been very brisk and the demand for supplies of general chemicals for the home market has been steady. Prices on the whole have remained firm. There is little or no change to report in the export market.



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## Next Week's Events

### MONDAY 22 NOVEMBER

#### Royal Institute of Chemistry

London: Woolwich Polytechnic, S.E.18, 7.30 p.m. 'Analysis of Plastics.' By Dr. J. Haslam.

Leeds: Chemistry Lecture Theatre, The University, 6.30 p.m. Annual general meeting of Leeds Area Section. 'The Lotoflavin Problem; the Study of a Toxic Natural Product' by Professor T. S. Wheeler, vice-president.

#### Chemical Society

Cardiff: Chemistry Department, University College, 5.30 p.m. 'The Chemistry of Alien Systems' by Professor E. R. H. Jones.

#### Institution of Chemical Engineers

Manchester: The College of Technology, 3 p.m. 'The Adiabatic Absorption of Hydrogen Chloride' by T. A. Kantyka and H. R. Hinckleiff.

#### Society of Cosmetic Chemists of Great Britain

London: St. Ermin's Hotel, Caxton Street, S.W.1, 7 p.m. 'The Merchandise Marks Act' by R. L. Lloyd.

#### British Ceramic Society

Stoke-on-Trent: North Staffordshire Technical College, 10 a.m. Symposium on recent developments in engineering applied to the pottery industry.

### TUESDAY 23 NOVEMBER

#### Textile Institute

Manchester: 10 Blackfriars Street, 7 p.m. 'Some Aspects of Yarn Tension in Weaving' by M. W. H. Townsend.

### WEDNESDAY 24 NOVEMBER

#### Chemical Society

Durham: Science Building, South Road, 7.45 p.m. Lecture by Professor E. G. Cox (joint meeting with RIC and SCI).

#### Society of Chemical Industry

London: Chemical Society's Rooms, Burlington House, Piccadilly, 6.30 p.m. Food Group Domestic Meeting. 'Some Aspects of Soya as a Bread Improver' by E. Mitchell Learmonth, and 'The Problem of Synthetic Cream' by Dr. Betty C. Hobbs.

#### Manchester Metallurgical Society

Manchester: Lecture Room, Central Library, 6.30 p.m. 'Some Experiences in Industrial Research' by Dr. B. P. Dudding.

#### Institute of Metals

Sheffield: University Buildings, St. George's Square, 6.30 p.m. 'High Temperature Water-Cooling of Open-Hearth Furnaces by Means of Steam Producing Elements' by F. J. Feltoe and P. M. Moreton, and 'The Cooling of Large Rolling Mill Drives' by P. M. Moreton (joint meeting with the Yorkshire Branch, Institution of Mechanical Engineers).

### THURSDAY 25 NOVEMBER

#### Royal Institution

London: 21 Albemarle Street, W.1, 6 p.m. 'Some Aspects of Geophysics—The Earth's Main Magnetic Field' by Dr. J. McC Bruckshaw.

#### Royal Institute of Chemistry

London: Battersea Polytechnic, Battersea Park Road, S.W.11, 7 p.m. 'Upscaling Chemical Projects' by Dr. S. A. Miller.

Stockport: The College for Further Education, Wellington Road South, 7.30 p.m. 'Some Chemical and Physical Aspects of Breadmaking' by S. W. Butterworth.

#### Chemical Society

Nottingham: The University, 4.45 p.m. Lecture by Professor A. Robertson.

#### Institution of Chemical Engineers

Manchester: Reynolds Hall, College of Technology, Sackville Street, 6.45 p.m. Graduates' and Students' Section. 'Electro-Precipitators' by D. O. Heinrich.

#### Institute of Fuel

London: The Institution of Civil Engineers, Great George Street, S.W.1, 5.30 p.m. 'Peat Fired Power Stations' by W. Cronin and J. F. Lang.

#### Institute of Metals

Birmingham: James Watt Memorial Institute, Great Charles Street, 6.30 p.m. 'The Working of Metals' by J. G. Wistreich.

#### Royal Statistical Society

Sheffield: Cavendish Room, Grand Hotel, 6.30 p.m. 'Reasons for Failure' by K. F. Lane.

### FRIDAY 26 NOVEMBER

#### Royal Institute of Chemistry

Cambridge: University Chemical Laboratory, 8.30 p.m. 'Antibiotics—Some Facts, Some Problems and Some Queries' by A. L. Bacharach (with the Cambridge University Chemical Society and the London Section, SCI).

*(continued on page 1112)*

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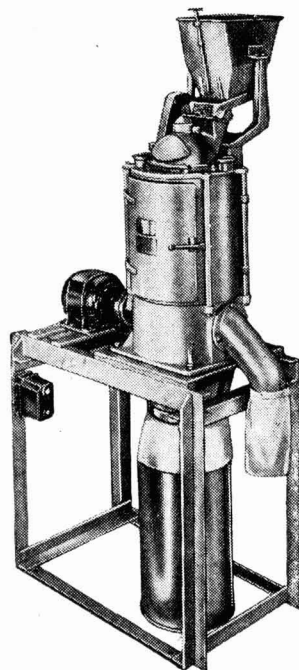
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**Next Week's Events***continued from page 1110***Chemical Society**

Exeter: Washington Singer Laboratories, 5 p.m. 'Some Applications of Electron Diffraction to Problems in Inorganic Chemistry' by Dr. L. E. Sutton.

Southampton: Chemistry Department, The University, 5 p.m. Tilden Lecture. 'Molecular Rearrangements' by Professor M. J. S. Dewar.

**Society for Analytical Chemistry**

Glasgow: Room 24, Royal Technical College, 7.15 p.m. 'Sea Water' by Dr. H. Barnes (joint meeting with Glasgow and West of Scotland Section, RIC).

**Institute of Metal Finishing**

Sheffield: Grand Hotel, 3.45 p.m. Annual general meeting followed by a technical session, 'Spark Machining of Metal Surfaces' by G. Fefer.

**Patent Infringement**

MR. JUSTICE LLOYD-JACOB made an order by consent in the Chancery Division on 2<sup>nd</sup> November in an action brought by Merck and Co. Inc., in conjunction with their licencees, Sharp and Dohme Ltd. and May and Baker Ltd. against Chemical Compounds Ltd., of 60 St. Paul's Churchyard, London, E.C. The action concerned Patent No. 562,763, 'Succinylsulphathiazole and Phthalylsulphathiazole'—granted to Sharp and Dohme Inc. (now Merck and Co. Inc. of Philadelphia).

The judge ordered that Chemical Compounds Ltd. be restrained from infringing the patent and that an account of the profits made by them, by reason of their manufacture and sale of succinyl- and phthalyl-sulphathiazole powder or tablets, be taken and the amount of such profits paid to the plaintiffs with the latter's costs of the proceedings. He further ordered that Chemical Compounds Ltd. should deliver up to the plaintiffs, or destroy or otherwise render unfit for use, all such powder, tablets and products containing them which were in their possession or the possession of their agents.

Mr. Eric Walker, for the plaintiffs, said that a similar order by consent was made last April against Thomas Kerfoot & Co. Ltd. of Ashton-under-Lyne.

**Removal Order Sought**

THE Town Planning Sub-Committee of Bradford City Council have recommended that an Order should be sought, under section 26 of the Town and Country Planning Act, to require the removal of the plant of Leather's Chemical Co. Ltd., Bradford, from its present site in Canal Road to one set aside for noxious industries at Low Moor on the outskirts of the city. The estimated cost of moving the plant to the new site is between £600,000 and £700,000.

Bradford corporation is one of the firm's best customers, for 100 tons of sulphuric acid are supplied weekly to the Corporation Sewage Department at Esholt.

This development is a sequel to the successful attempt by the corporation to attach conditions to an extension of the Canal Road works, whereby they stipulated that the extension should be for only 15 years and that the Medical Officer should be given power of entry to take samples of air. The firm successfully appealed against such conditions. At the inquiry Mr. J. R. Burnet, managing director of the firm, admitted that the site at Low Moor was desirable, but stressed the high cost of moving (*THE CHEMICAL AGE*, 1954, 70, 1469).

**Plastics Exhibition**

BRITISH plastics manufacturers, with an output in 1954 nearly 30 per cent above the previous year's figure and exports 25 per cent up, have over-applied for space in the third biennial British Plastics Exhibition, to be held at Olympia, London, from 1 to 11 June 1955.

All space in the Exhibition was booked within a fortnight of the publication of the prospectus, and this is taken as a sign of the buoyant state of the industry and experience of the previous exhibitions when much was done to win new customers.

There will be nearly 100 exhibitors, including all the best-known firms in the industry. Most of them have exhibited previously, but the list, which will be issued later, contains several newcomers. The exhibits which will consist of the latest materials, plant, mouldings and fabricated goods, will cover 33,000 sq. ft. in the National Hall, Olympia.

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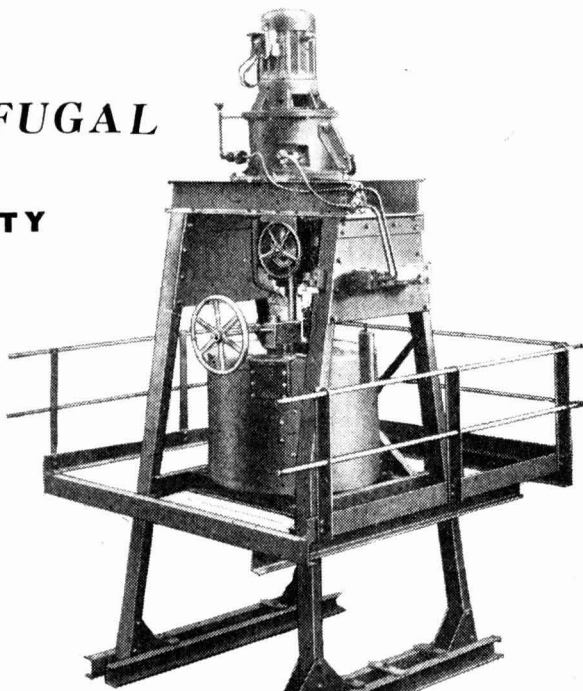
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## 1955 ANNUAL REVIEW NUMBER The Chemical Age JANUARY 8th



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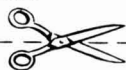
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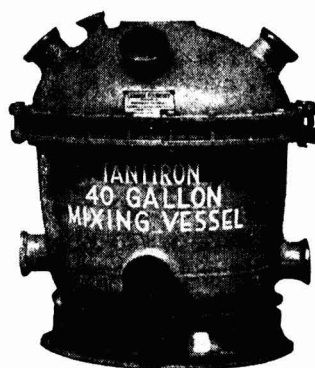
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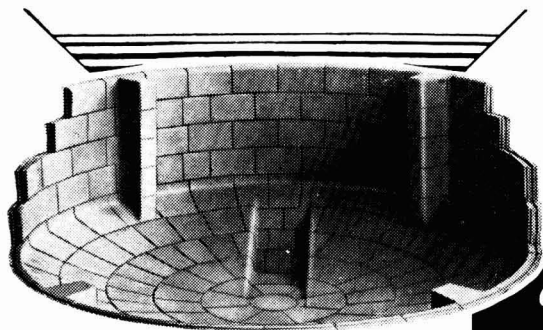
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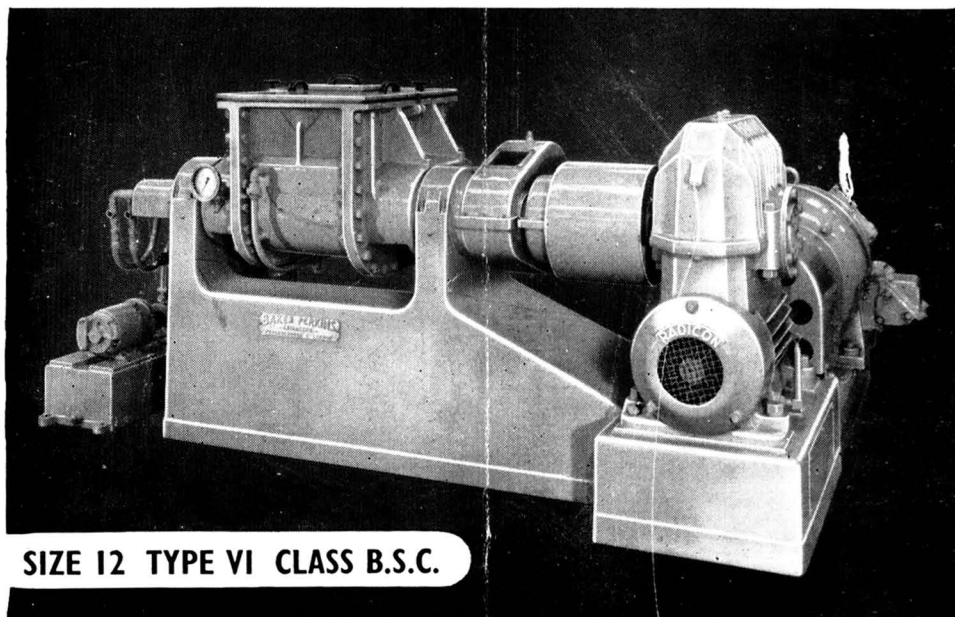
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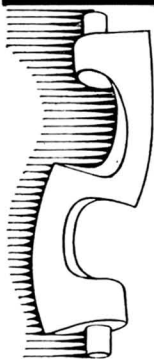
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