

# The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

VOL. LII  
No. 1344

SATURDAY, MARCH 31, 1945  
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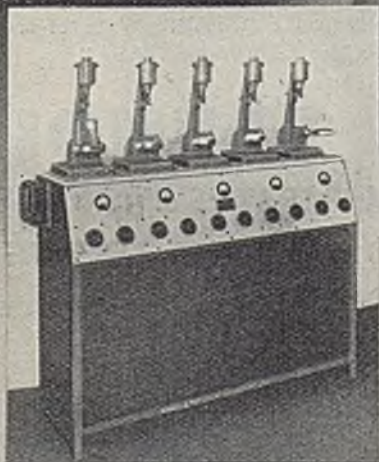
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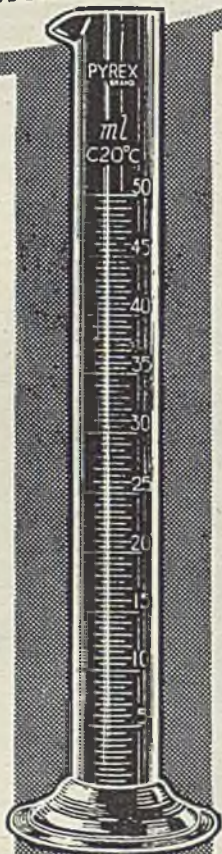
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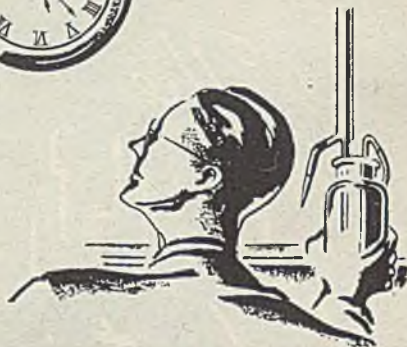
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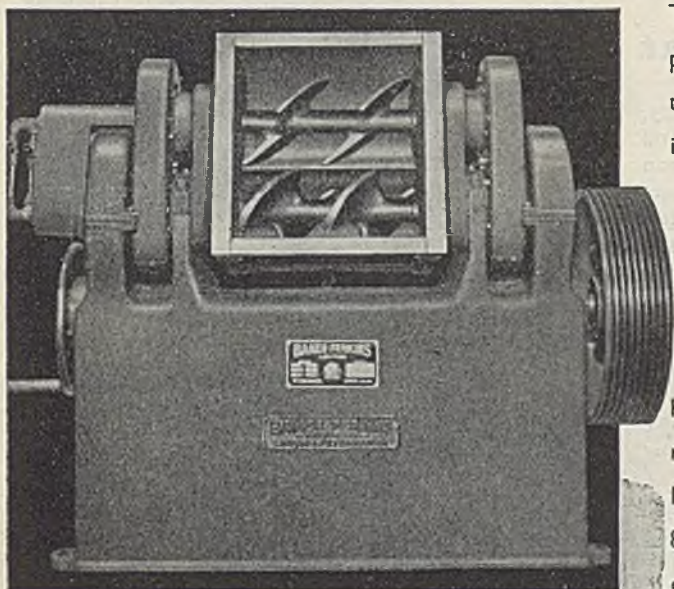


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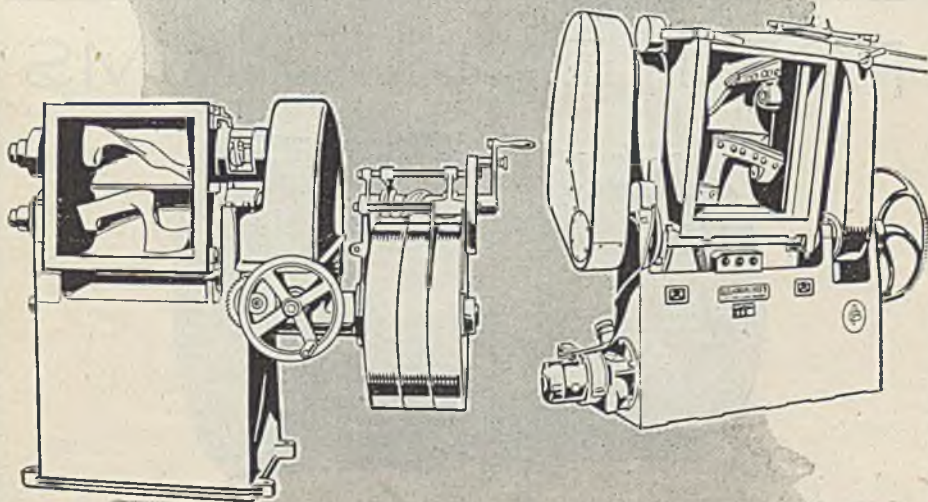
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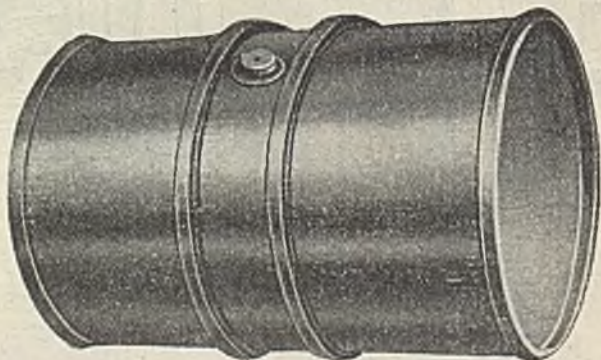
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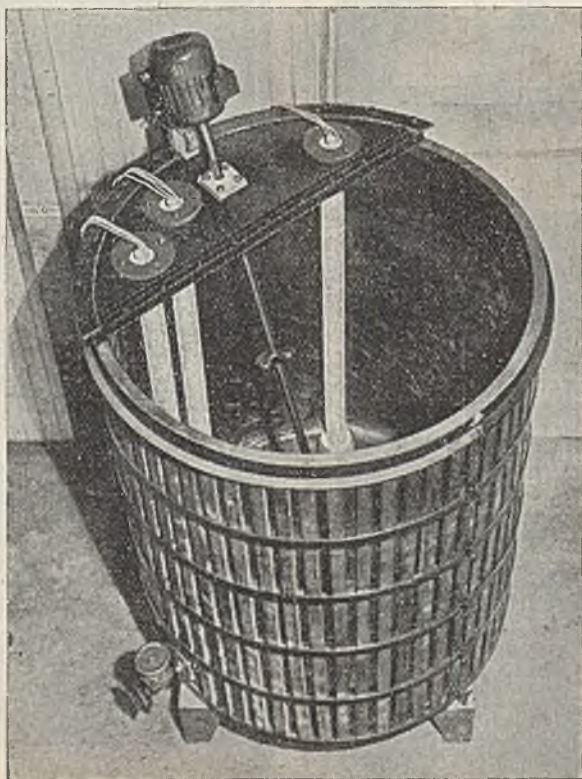
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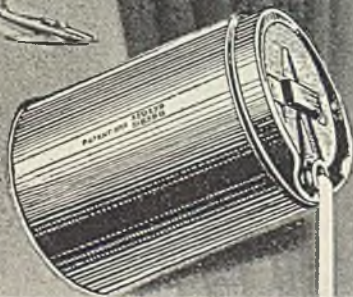
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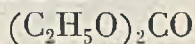
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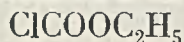
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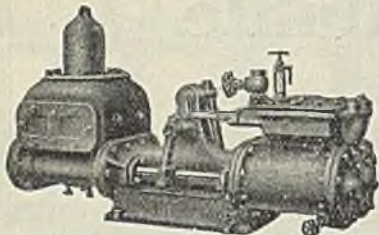


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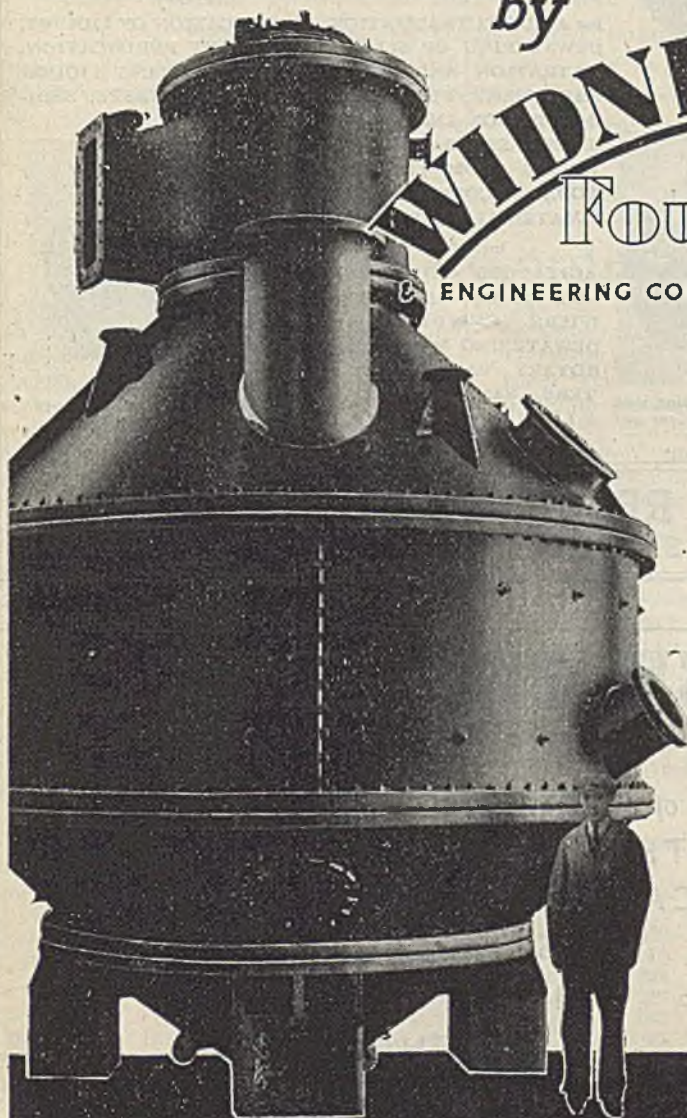
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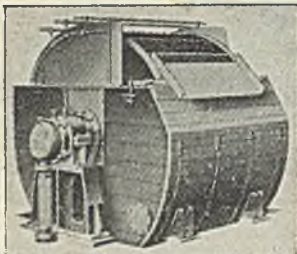
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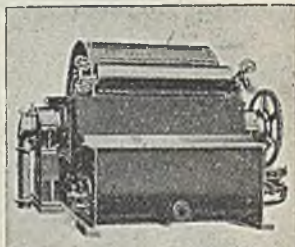
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VOL. LII  
No. 1344.

March 31, 1945

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## Research Co-ordination

THE purpose of organisation is to avoid waste, whether of effort, of money or of material. Organisation is the basis of our civilisation. It is so much a part of civilised life to-day that we take it for granted. If the Post Office was not organised, our letters would not arrive so expeditiously. If the railways were not organised, trains, if they ran at all, would never run to time, and a journey would be a highly adventurous and precarious undertaking. Every trade and industry is organised in order that a flow of materials shall be maintained to the factories, and the necessities of life shall be available.

Many things, however, are not organised, and we do not always see how organisation is possible nor why it should be attempted. Organisation

is often confused with regimentation. The farmer does not think he is "regimented," or "subjected to control" because the morning milk train leaves at a fixed time not under his control and he must have his milk ready at the station, or miss his sales for that day. The green-grocer does not complain of "control" because Covent Garden opens very early in the morning, and those who are not there are left with

the less desirable produce. This is organisation for the general good, and everyone puts up with it. It is only when some new form of organisation is found to be desirable that there comes an outcry that the liberty of the subject is in danger. Organisation as such, and when it performs some useful function, is not only desirable but necessary.

The protestations of scientific men that they should be allowed to work in their own way and without being told what they should do strike us as a partially justified protest against organisation. The true scientific worker, the scientist with a real flair for research, will work far better if he is allowed to follow his bent and his "hunches" than if he is kept on the straight and narrow path of experiment mapped out for him.

That may not apply to all grades of scientific worker; we do not propose to argue that point. The scientific worker who operates as it were in a vacuum requires organisation to avoid waste of effort. We do not here suggest that scientific workers outside industrial laboratories should be "organised" to the extent of causing the work they do to be decided for them, but we suggest that it should be possible to increase the output

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of research workers and to avoid the duplication of work that so often occurs now.

Dr. Kind, in his letter to THE CHEMICAL AGE on February 17, raised the issue without, however, giving a specific solution. He pointed to the grave danger that, after so many years of secrecy due to war conditions, lack of publicity might well become a habit. It is not only due to war conditions that that may happen. There are many chemists, chemical engineers, and others who do useful work, who put it away in their notebooks for future use if required, and forget about it. They may be too busy at the time, they may think it is of no value, they may be merely shy; whatever the reason, it never sees daylight. There is another class of work which may also never become public, that done for a firm with the specific object of improving the firm's processes or products, or of increasing the range of usefulness of the products. The problem is how to prevent all this work from being lost to mankind, so that it has to be repeated by subsequent workers in the same field.

The solution of this problem is extremely difficult. In fact, we fail to see a solution within the compass of any existing machinery or of any machinery which could easily be set up. Possibly, now that the problem is stated, our readers may like to put forward their ideas, for we believe that many minds are exploring this difficulty. One suggestion is that a central organisation should be set up to which all who are engaged on research should submit reports. This need be no more than a register of research, in which the subjects upon which work is in progress would be recorded, together with the name of those engaged in the work, thus enabling those at work in the same field to be put into touch with one another. We know that workers in a particular field often compare their results as they proceed; but they must first be mutually aware that they are at the same task. So far as we can see, that is as far as the organisation of research could go, as a general and universal method. It would be left to the individual whether he would collaborate or not, and that would cover the difficult case of the firm engaged in developing something new,

and not desirous of parting with information at least until the matter had been patented.

Something of the sort is already in being in the field of fuel research, where the D.S.I.R. has set up a Standing Consultative Conference. It is intended that this body shall bring about the co-ordination of the programmes of all research associations dealing with fuels, so as to ensure the most appropriate allocation of important investigations and to avoid undue overlapping. This is, of course, only a very partial step towards the solution of the general difficulty. It is in one specific field and it covers only research associations. What we have in mind is the case of a researcher—whether for a firm or on his own account—deciding to work on a certain reaction for a particular purpose: general interest, patents, overcoming a works difficulty, etc. It may be that, all unknown to him, the same problem has been tackled already. A search through literature, aided by the chemical abstracts, will reveal what has been published. But it gives no clue to what has *not* been published. If chemists and physicists generally could agree voluntarily to submit (a) the subject upon which they work, and (b) a very brief résumé of their conclusions for filing, it would be possible to avoid much overlapping by keeping a comprehensive card index. The conclusions need not be open for all to see without the agreement of the author, but should be included for future reference after he has gone the way of all flesh.

Any such organisation must be entirely voluntary. Employers will be chary of filing any work that might lead to a patent unless due safeguards are imposed. One of these would be that filing the conclusions does not constitute publication as understood in the Patent Office, unless the person filing states to the contrary. What further safeguards are required we forbear to suggest. This is nothing more than the germ of an idea for the better organisation of research and the avoidance of wasted time. It may have insuperable objections. One difficulty is finance. But if we are to advance as quickly as we believe will be necessary after the war, some means of avoiding duplication of effort should be useful.



# NOTES AND COMMENTS

## Distribution of Industry

**I**N the debate last week on the second reading of the Distribution of Industry Bill in the House of Commons, members had several controversial points to consider. There is the question to what extent the Board of Trade should control the location of factories—a question largely depending on the amount of attention and assistance needful for the “special areas”; and there is the problem of dispersal of industry for strategic reasons. Mr. Dalton not unnaturally lauded the achievements of his own department and referred to the value of the habit of consultation which had recently grown up between the Board of Trade and industrialists; and he asked that the Government should be given very considerable powers of control over the distribution of industry—power, as he put it, “in reserve against the time when war-time controls would have passed away.”

## An Independent Authority

**S**IR GEORGE SCHUSTER moved the suspension of the Bill on the ground that certain areas could not be favoured without reaction on the country as a whole. He asked for the establishment of an independent central authority, outside the political field, to make research into all the factors affecting the location of industry. All areas were in a sense development areas, and, in his view, if a study was made of how to make the best use of our material resources, the location problem would solve itself. Generally, the proponents and antagonists of the principle of nationalisation spoke respectively for and against the Bill, but it would appear that, in view of the fact that facilities for building immediately after the war are likely to be substantially less than the demand, any decision taken now is bound to be little more than tentative. Even if the Board of Trade is granted plenary powers, the Ministry of Supply will have the final say in the matter, and half-a-dozen considerations of practicability will have to be perpended before any large industrial building scheme can be undertaken. All things considered, and

especially Mr. Lyttleton's warning about the necessity for strategic dispersal, there is much to be said for the suggestion of seeking, while there is yet time, the advice of a non-political team of experts. There is little doubt that there is necessity for some direction of the location of industry; the question is: who shall do the directing?

## A Check on Cartels

**S**OME sort of check on cartels and monopolies is evidently a part of the Government programme. In the House of Lords last week, Lord Woolton, though rejecting Lord Nathan's suggestion of a corps of publicly appointed directors—he thought that anyone sufficiently highly qualified to occupy such a post would be better employed on productive work—spoke with approval of the establishment of a court of some sort to which monopolists, or the citizen, could appeal when investigation seemed necessary. We have always maintained that there was nothing *inherently* wrong in the practice whereby members of the same trade associate themselves for the purpose of regulating that trade. Some trade associations, as Lord Woolton said, serve a good national purpose; some, on the other hand, have been doing harm; and we agree with the Minister of Reconstruction that they should be judged by results. To discover these results, publicity is essential, and those “monopolists” who have nothing to fear from investigation have already invited publicity. In last week's debate, Lord Geddes and Lord Dudley spoke respectively of the virtues of the Rhodesian copper combine and the International Steel Cartel; but Lord Latham declared that any public benefit from restrictive trade practices was simply a by-product—almost an accident, as it were. A good point was made by Lord Cozens-Hardy, who suggested that monopoly of manufacture without monopoly of sale could be definitely in the public interest, particularly in industries requiring much heavy plant, operated by skilled personnel with the fullest technical resources, and supported by adequate research. There is something to be said for the argument that

without organisations of this kind we may find ourselves unable to compete with countries where some such marshalling of industrial resources is recognised, whether on a national scale, as in Soviet Russia, or within an industry as in the United States.

### Courtauld's and Cumberland

**A**N important step towards the development of Cumberland—discussed in great detail in *THE CHEMICAL AGE* of October 14 last—is represented by the statement made by Mr. Samuel Courtauld to stockholders, a few days ago, that his concern is negotiating for the purchase of a site at Sellafield, between Whitehaven and Seascale in West Cumberland, on which to erect a new plant. Water of the quality required in the production of certain of the firm's products is available from Ennerdale Lake, and there is also an ample labour force. An early conclusion of the negotiations would go a long way towards bringing about an industrial stability previously unknown in Cumberland. It is reported that the Cumberland Development Council is receiving many applications for factory space and that there are good prospects for post-war employment. It is thus gratifying to see that regional planning, aided by the right type of publicity, so far from sapping individual enterprise, is, in fact, making for the national welfare.

### A "Cut" in Conventions

**I**F anyone has ever honestly believed that American industry was not taking the war seriously, a recent decision of the Executive Board of the American Gas Association should remove any lingering doubts. "In the interest of the war effort," the Board has cancelled nine meetings originally authorised to be held between February and June this year. That this should occur on the native heath of the industrial convention may surely be regarded as a token of earnestness regarding the job in hand. In future, organisations planning conventions and the like "will have to show the war effort would suffer if the meetings were not held." The *Gas Age* points to the success with which kindred institutions in Great Britain

have been carrying on, with meetings, but, as we know very well in the chemical industry, many important meetings have had to be cancelled, and neither the scope nor the attendance at such war-time meetings as there have been can compare with their pre-war counterparts; nor, to judge from the illustrations in the American press, with the conventions that have been held in the U.S. The *Gas Age* further suggests the carrying on of conventions by correspondence; that would indeed be a poor substitute, in our view; for, in default of the harmless junketings and the useful and agreeable personal contacts that are customary when colleagues from a distance forgather, there would be small inducement to undertake the necessary work of organisation. It is a point of special interest that one of the cancelled meetings is the Production and Chemical Conference, scheduled for June 4-6 in New York.

### Royal Society Chemists

**C**HEMISTRY and allied sciences have been well served in the elections to the Fellowship of the Royal Society which were announced last week, following nomination. Professor J. M. Gulland, who holds the chair of chemistry at University College, Nottingham, has been honoured for his work on the phenanthrene group of alkaloids; his work in organic chemistry and biochemistry generally is well known. Professor J. M. Robertson, of Glasgow University, is distinguished for his work on X-ray analysis, and Professor V. C. Illing, of Imperial College, London, for his advancement of the knowledge of oil technology. Among the other elections, that of Professor F. M. Rowe, of Leeds University, will be particularly pleasing to the chemical industry. In addition to his outstanding research achievements in the chemistry of colour and dyes, Professor Rowe has done a great deal of valuable work in an editorial capacity for the Society of Dyers and Colourists. Dr. L. Colebrook's name is associated with important clinical tests with sulphonamides, while that of Dr. H. D. Kay is bound up with the striking advances made recently in dairy research at Reading.



## FUEL EFFICIENCY IN THE CHEMICAL INDUSTRY

## Fuel Economy Discussions

## IIa.—Producing Fuel Gases\*

by P. M. K. EMBLING,† B.Sc. Eng.

THE fuel gases likely to be produced in industrial works for heating purposes are either producer gas or blue water gas.

(a) *Producer Gas*.—Producer-gas plants may either be hand-operated, which is usual for outputs of up to 40,000 cu. ft./hr., or mechanically ashed, for outputs of over 60,000 cu. ft./hr., while both are suitable for the intermediate range. Fuels of many types may be used for gas producers, e.g., anthracite, bituminous coal, coke, or wood. For most satisfactory operation all fuels should preferably be of even grading. Coals should be non-caking. Coke should be free from black ends if cold clean gas is required. The ash fusion temperature should preferably exceed 1150°C. in a reducing atmosphere.

Factors affecting the efficiency of operation were discussed with particular refer-

ence to the losses arising from: moisture; carbon in ashes; dust and soot; radiation and leakage; tar; sensible heat; and stand-by periods. For the production of cold clean gas the producer should be designed to obtain a low gas outlet temperature to avoid heat losses in cooling and to obtain the maximum calorific value of gas.

(b) *Water Gas*.—Blue-water gas plants may also either be static and hand-clinkered or mechanically charged and ashed. Generally speaking, the cycle should be arranged so as to yield a minimum amount of potential heat in the blow gases. The necessity for providing adequate instruments on all plants was indicated. The operators should be carefully instructed and trained, since the efficiency of operation ultimately depends on the operator.

## IIb.—Utilisation of Producer Gas\*

by H. TRUMAN†

EFFICIENCY of utilisation can often be improved by planning the production so as to make the maximum use of a minimum number of furnaces, thus reducing the hours in which the furnace is maintained at holding temperature. The consumption of each furnace should be checked at holding temperature and for starting up from cold, so as to determine whether it is more efficient to maintain some defined temperature or to shut down and restart when required. Furnace doors should be kept closed as much as possible and lids should be kept on melting furnaces. The right size of burner nozzle must be used; the wrong size of nozzle may reduce combustion efficiency. For open-flame burners a gas high in hydrogen is preferable so as to prevent the flame blowing off the end of the burner, while for closed furnaces it is generally preferable to use a gas with a maximum content of carbon monoxide. With torches and brazing burners, waste of gas arises if these are kept full on when not in use.

Careful records should be kept giving the gas consumption per lb. of metal melted or per unit of work done. Automatic temperature controls can give highly satisfactory results, but it should be remembered that

the use of on/off controls with only a small by-pass may throw a big load fluctuation on the gas plant. The greater part of the base requirements of gas should be supplied through the by-pass, the minimum quantity being supplied through the control. The use of suitable instruments, for example pressure control or flow meters for gas and air, enables maximum efficiency to be obtained.

Clean gas must be adequately cooled. The mains should be provided with ample drains to reduce to a minimum the water carried into the furnace, which can cause scaling of heating pots, etc. Pre-mixing of air and gas, either partly or wholly complete, may help towards efficiency. When mixing with a theoretical quantity of air, efficient flame traps are necessary on every burner to prevent flash back to the compressor.

## Discussion

Q.—Has open-cast coal been used in gas producers?

A.—No instance is definitely known.

Q.—The inherent moisture content of open-cast coal may vary up to 20 per cent. How would this affect its use?

A.—The moisture would not be a difficulty provided the amount was known in advance. Vegetable refuse containing up to 40 per cent. moisture has been gasified successfully. The caking properties of open-cast coal may vary considerably, being low

\* The papers, delivered in Manchester on December 13, and in London on December 20, 1944, are not available except in summary form. The discussion, however, is published in full.

† Power Gas Corporation.

near the outside surface and gradually increasing the further one goes in.

Q.—If a plant is already up to load on better quality coal, is trouble like to be experienced with open-cast coal?

A.—Probably, yes.

Q.—Why has not more use been made of low-grade and refuse fuels containing 40-50 per cent. moisture? Is it due to channelling difficulties?

A.—Such fuels could have been gasified in specially designed producers, but the gasification rate is usually low and hence the capital cost high. It therefore becomes a question of economics. A plant was recently put into operation in this country gasifying sawdust containing 40-50 per cent. moisture.

Q.—It has been stated that it is preferable to use gas producers without lining under certain conditions. What methods are recommended?

A.—Ordinary boiler-quality steel plate is satisfactory next to the hottest part of the fire, provided that there is water on the other side. If the gas is to be cooled and cleaned a jacketed producer without refractory lining would yield all the steam necessary; with the jacket there would be a minimum adherence of clinker to the walls if any.

### Fuel Grading

Q.—Could the subject of fuel grading be amplified especially regarding anthracite? What grade should be used and should it be mixed?

A.—A producer may be operated on fuel within a wide range of grading, but the best results are obtained if the fuel is graded between fine limits. The main difficulty with ungraded fuel is segregation. If the fuel is of a wide range of grading it might be preferable to grade it into two sizes and use the two sizes with separate producers. The gasification rate depends upon the range of grading. Anthracite can be gasified satisfactorily in the form of grains, peas, or nuts, but these gradings should not be mixed.

Q.—We wish to obtain better results from a plant using fuel up to  $\frac{3}{4}$  in. Should we get better results if we used fuel up to  $1\frac{1}{2}$  in.?

A.—A higher rating could be obtained with a larger fuel provided that it did not contain much fines.

Q.—Should the smalls not be mixed with the large?

A.—Preferably not.

Q.—What is the maximum distance from the producer to the furnace when using hot raw gas?

A.—Examples up to 300 yards are known, but the main must be efficiently insulated if excessive heat losses are to be avoided.

Q.—We burn out our gas mains about once a fortnight. Is this normal?

A.—It is usual to burn out mains about once a week or once a fortnight particularly when using producers working very hot, since soot is formed under these conditions.

Q.—In considering new installations in which gas has to be carried a long way from the plant, should a proper investigation be made as to the relative advantages of hot raw gas and cold clean gas?

A.—All the facts should be taken into account.

Q.—What is meant by micro-control valve?

A.—A valve geared so that fine adjustment can be obtained. Such valves are usually provided with a scale to show the amount of opening.

Q.—Are any figures available as to the saving which could be effected by changing over from coal firing to producer-gas firing on melting furnaces?

A.—Unfortunately very few figures are available for solid-fuel firing. The figures depend to a large extent on the type and design of furnace. In the light alloy industry variations between 36 and 70 therms per ton of metal have been made on either oil, town gas or producer gas. With gas firing there is sometimes a tendency for the operator to turn on too much gas with the object of speeding up the melting, but the efficiency is not improved by this method.

Q.—How does one test the efficiency and working of a producer plant?

A.—Full details are given in B.S.995.

### Outlet Temperature

Q.—It is suggested that the outlet temperature of the producer should be 500°C. or below. Does this relate to producers on bituminous coal, as the outlet temperature on coke may be about 700°C.?

A.—This depends on the type of producer; there are many gas producers operating on coke with an outlet temperature between 300° and 400°C.

Q.—Is this not due to the heat absorbed by the water jacket?

A.—This is partly the reason, but the fuel depth also plays its part, especially in the gasification of bituminous coal.

Q.—Can the efficiency on cold gas be increased above, say, 72 per cent., and would preheating improve this efficiency?

A.—Cold gas efficiencies are often 76-77 per cent. on coke and up to 80 per cent. on anthracite. The preheating of the air-steam blast may improve the efficiency slightly, but up to the present preheats have not been tried above 300°C.

Q.—On a producer working on bituminous coal there was a build-up of coke in the downcomer. Could any information be given for dealing with this?

A.—This is usually due to tar and sooty matter which is difficult to remove. Under certain conditions a water spray may help.



Q.—Is this effect due to working the producer at too high a rate?

A.—No, the producer was not being worked up to the load.

Q.—Can poking do more harm than good? How often should a producer be poked?

A.—About once per shift or as found necessary, but the poking should be done carefully and only when it is required. Too much poking can make matters worse.

Q.—What simple test can be used by the operator to make sure he is working on the right lines?

A.—A thermometer is required for the air blast temperature and it is also an advantage to have a gas outlet pyrometer and a flow meter for gas quantity. Operators can be trained to do simple gas tests on an Orsat type apparatus for CO<sub>2</sub>, O<sub>2</sub>, and CO.

Q.—What is the simplest way of making a check on the fuel put in and also on the carbon in the ash?

A.—The best method of checking the fuel used is by weighing. Measurement, if carried out under carefully standardised conditions, may give an approximate figure. Carbon in ashes must be tested after drying by the ordinary laboratory method for determining carbon; alternatively, an approximate guide can be obtained from the loss of ignition on the dried sample.

Q.—A pre-distillation zone has been proposed, but this does not appear to have been adopted.

A.—Many German designs which are mainly intended for brown coal use pre-distillation zones. Even though this may improve the tar, it is still not easy to dispose of.

Q.—What can you do with the tar from modern producers?

A.—The quantities are usually too small for separate treatment by the tar distiller and therefore it is probably simplest to burn it as a fuel in a boiler.

## Agricultural Weed-Killer

### A Revolutionary Discovery

**A**N entirely new and revolutionary type of selective weed-killer for agriculture has been discovered by Imperial Chemical Industries. Exhaustive tests, lasting two years, have now been followed by nationwide trials carried out jointly by I.C.I. and the Ministry of Agriculture through the County War Executive Committees.

The weed-killer, known as methoxone, is a growth substance of the plant hormone type. It was in 1940 that I.C.I. discovered that two chemicals of this type showed remarkable properties as selective weed-killers. Their peculiarity was that they would kill charlock and many other weeds without harming cereal crops. This justified further research into the plant hormone type of substance; in 1941 it was found that all had properties as selective weed-killers, some of them being extremely active. One of them, methoxone, was selected in 1942 as likely to be the most useful for agricultural purposes. At that time other scientists in Great Britain also began investigations on a parallel substance, chloroxone, the name given in Britain to the weed-killer recently announced by the Americans and called by them D.C.P. (The first experiments with chloroxone as a weed-killer began in the U.S.A. in July, 1944.) Field experiments on a large scale with methoxone and chloroxone were carried out during 1943 and 1944 and methoxone proved to be the more effective of the two.

The selective properties of methoxone lie in its power to kill certain types of weed while leaving cereal crops and grasses unharmed. When applied at a rate of 1 lb.

per acre, weeds such as yellow charlock, wild radish, corn buttercup and pennycress growing in corn are killed, but the crop is unharmed. The most important factor arising from this revolutionary discovery is that weeds can be eliminated in the early stages of growth before they have been given a chance to rob the crop of the food available in the soil. Large increases in yields of wheat, barley and oats should result. In grassland, buttercup has been completely eliminated, thus making available increased food for cattle.

The programme of methoxone trials for this season is the most extensive ever carried out in Britain and is designed to obtain information upon a wide range of weeds under a variety of conditions.

## Society of Chemical Industry

### New Officers for London

**A**T the annual meeting of the Society of Chemical Industry, London section, which is due to be held in the Chemical Society's Rooms on May 7, at 2.15, members will be elected to fill the vacancies on the committee. Officers who retire in July, and who are not eligible for re-election, are as follows: Chairman, Dr. R. T. Colgate; vice-chairman, Dr. A. J. V. Underwood; members of committee, Dr. T. H. Durraans, Dr. R. Lessing, Mr. T. Rendle. Nominations to fill the resultant vacancies must be signed by not less than five members of the section (no member may sign more than one nomination), and the nominee must indicate his willingness to serve if elected. Nominations must reach the hon. secretary by first post on April 9.



# Norwegian Chemical Resources

## Metals and Water-Power

NORWAY is often regarded as a barren country, offering only a scanty living to its inhabitants. This is far from correct, because when the nation's vast water powers had been harnessed to supply "white coal," Norway was able to catch up with industrial progress made in other countries and to provide new occupations for its people which raised the country to a highly industrialised level. In Norway are Europe's greatest water-power resources, calculated at 9.2 million kW, and cheap hydro-electric power has made possible the establishment of important metallurgical and chemical industries; and the resultant cheap production of

country's oldest exporting industry. In 1623, the Kongsberg Silver Works (Kongsberg Solvverk) were established, and at a somewhat later date several copper works were opened, including the Røros Copper Works in 1644. Iron works were founded in various districts in the middle of the 17th century, at the close of which there was considerable mining activity throughout the country. The mining industry gradually expanded at such a pace that it finally employed about 8000 persons, the value of the annual output being more than 20,000,000 kroner. Before the present war, annual output in tons was as follows: silver ore 16,000; iron ore 1,065,000; copper ore 70,000; pyrites 1,045,000; nickel ore 41,000; felspar 40,000; other minerals 84,000.

Norwegian cupriferous pyrites contains about 40-48 per cent. of sulphur, approximately 35-45 per cent. of iron and 1.7-3.5 per cent. of copper. Some high-grade pyrites is marketed with a copper content of up to 6 per cent. Pyrites with a lower value of both sulphur and copper is also worked, but these grades are mixed, so far as possible, with the higher grades with a view to obtaining a product better suited to the manufacture of sulphur dioxide and sulphuric acid. Other pyrites mined in Norway contains from 40 to 50 per cent. sulphur, 35 to 45 per cent. iron, and insignificant quantities of copper. All the grades mentioned contain also a certain quantity of zinc; in some instances also small percentages of nickel, silver, and gold occur, and modern methods have been applied in the utilisation of these metals along with the extraction of the copper. Norway is second only to Spain as regards sulphur pyrites; she has the world's largest zinc-producing works, and holds first rank in molybdenum- and titanium-bearing iron. As a result of the improved furnaces now available for the utilisation of various ores, and also with the aim of using low-grade ores, most of the mining concerns have erected ore-dressing works at a considerable cost.

Next in importance is the extraction and refining of iron ore, the bulk of Norway's production being contributed by the A/S Sydvaranger. In 1938, output amounted to 1,065,000 tons and exports to about 1,000,000 tons. Only a comparatively small quantity of iron ore is used in the country. The larger part of the capital invested in Norwegian mining works has always been in foreign, usually in English, Swedish and German hands.

The natural resources of Norway include no coal, except what is brought in from the dependency of Svalbard (Spitzbergen),



Fig. 1. The hydro-electric power station at Rjukan, amid scenery typical of the surroundings of many Norwegian industrial plants.

chemical fertilisers has helped in the introduction of scientific farming methods. Forestry, too, has been assisted by virtue of the fact that timber could be exported in its more valuable forms: paper and pulp.

Norway's mining industry dates back to the beginning of the 17th century and is the



where the annual output of the mines was about 300,000 tons, but has been increased considerably during the war. However, energy from waterfalls is now used in practically all branches of industry; and owing

of a major industry in Norway. In Telemark province is the world's largest establishment for the manufacture of nitrogen, belonging to Norsk Hydro, with plants at Rjukan, Notodden, and Porsgrund. Elec-



Fig. 2. The Orkla Gruber A/B, which handles half Norway's pyrites, has developed a process of its own for producing pure sulphur and copper nitrate.

to this fact more than half of Norway's industries are situated in rural areas. Factories engaged in the production of nitrogen and its products, carbide, aluminium, zinc, etc., are the largest consumers; the world's biggest electrolytic plant is at Rjukan, where the first waterfall to be utilised for large-scale industry is located. Altogether, 2595 power plants were in operation in 1935, with a total installed capacity of 1,857,000 kW. That means that of the h.p. available only 2½ million have been developed, so that with the increasing development of water-power in the electric smelting, electro-metallurgical, and electro-chemical fields, great untapped possibilities exist.

The most important products of the electro-chemical and electro-metallurgical industry in the last pre-war year (in tons) are shown herewith:

Nitrate of lime	...	...	355,000
Nitrate of soda	...	...	11,650
Dolomite "Calnitro"	...	...	26,350
(Nitrogenous dolomite fertiliser)			
"Calnitro"	...	...	22,550
(Nitrogenous lime fertiliser)			
Carbide	...	...	36,150
Cyanamide	...	...	34,270
Explosives and matches	...	...	7280
Superphosphates	...	...	20,290
Zinc	...	...	45,000
Nickel	...	...	6100
Aluminium	...	...	15,405
Ferro-silicon	...	...	41,500
Other ferro-alloys	...	...	93,000
Pig-iron	...	...	32,750

A Norwegian professor, Olaf Birkeland, invented the process for the production of nitric acid and nitrates from the fixation of atmospheric nitrogen which became the basis

of a major industry in Norway. In Telemark province is the world's largest establishment for the manufacture of nitrogen, belonging to Norsk Hydro, with plants at Rjukan, Notodden, and Porsgrund. Electrical energy is supplied by the Rjukan waterfall, which also provides current for Høyanger at the head of a branch of the Sognefjord, where a large aluminium plant is situated, equipped with an important research laboratory. Nitrogen production, along with the manufacture of carbide, used in the production of synthetic rubber, was greatly developed by the Germans.

An electric power station on the Skien waterway supplies factories turning out cellulose, carbide, and rayon. Norway had more than 200 factories for the production of paper and pulp, with a total production of 1.9 million tons, valued at £2,330,000. Britain was the biggest buyer of Norway's paper and pulp, taking a total of 539,000 tons of pulp and 85,000 tons of paper in 1937.

Another important Norwegian industry is fish-oil production, which is closely connected with the margarine industry. Northern Norway is the location of the great cod fisheries, and here the cod-liver oil is produced. Within a few hours of the capture of the fish, the liver is on its way to the refineries for the production of medicinal oil. Whaling yields an annual oil production of 735,000 barrels valued at £1,895,000, while the yearly yield of cod-liver oil is 3.2 million gallons. There are also about 80 herring-oil factories and 10 oil mills. In 1939, the total value of exports was £2,330,000.

In recent years, science in Norway has shown a marked leaning towards industrial research. As early as 1908, one of the leading industrial enterprises, Norsk Hydro, was founded as a result of a combination of experimental science with large-scale engineering—the Birkeland-Eyde process. Up to the



date of the German invasion, the Government co-operated with business interests in order to facilitate industrial research, and the demand was raised not long ago for a central institution in this field. The mining industry of Norway has its academy at

man occupation. Norway, in the German plans for their future "New Order," was destined for the rôle of the principal European supplier of aluminium, for the production of which great quantities of electric power are needed. Meanwhile, the Nord-

Deutsche Bank, Hamburg, acting as representative of the big German steel concerns, obtained a preponderating influence in the iron-mining company, A/S Sydvaranger, which for this purpose increased

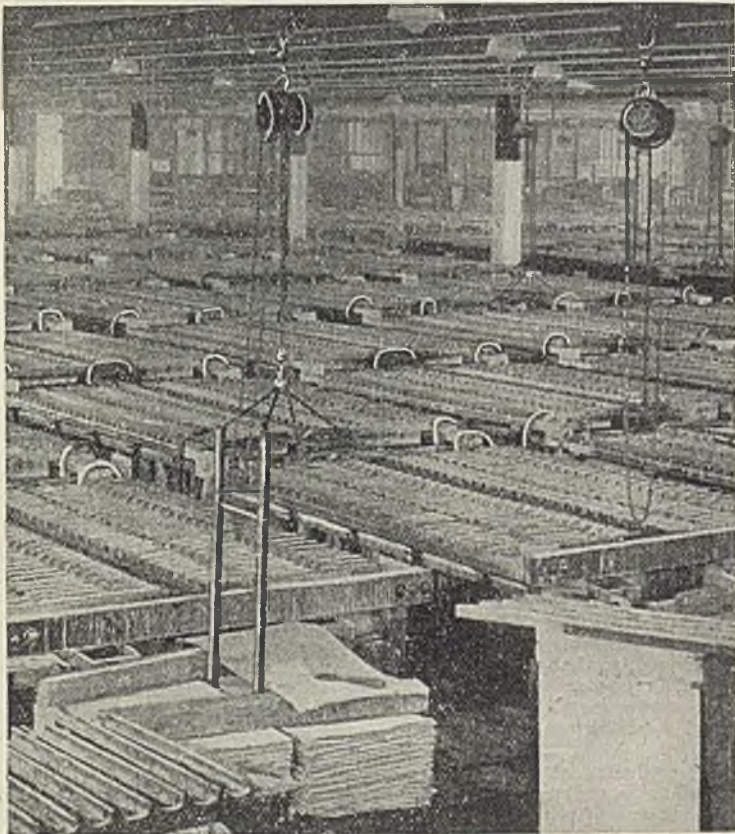


Fig. 3. Part of the electrolytic section of the Norwegian Zinc Company's plant.

its capital from 10 to 16 million kroner.

In order to increase aluminium production, the Nordag Company was established in Oslo at the beginning of 1941, with a capital of 79 million kroner, for the production and manufacture of light metals

Kongsberg, founded in 1759. Mention should also be made of the Agricultural College at Aas (near Oslo) established in 1854, and of the Technological College at Trondhjem (1910). Of special importance to the foodstuff industries is the State Institute for Vitamin Research at Bygdøy (near Oslo), established in 1928, with the special purpose of testing Norwegian medicinal cod-liver oil. The problem of transforming whale oil into edible fat was solved at the De-No-Fa laboratories at Fredrikstad, while the canning industry, in 1931, centralised its research in large laboratories at Stavanger, the principal centre of this industry. Leading pulp concerns have special laboratories, and the Borregaard concern operates a rayon test plant.

Norway's industry has, of course, changed and suffered considerably during the Ger-

Capital was provided by the Bank der Deutschen Luftfahrt A.G. and the Hansa Leichtmetall A.G., Berlin, on behalf of the German State. The A.S. Norsk Lettmetall, Oslo, with a capital of 30 million kroner, belongs to three different groups: Norsk Hydro, I. G. Farbenindustrie, and Nordische Aluminium A.G., Berlin. Nordische Aluminium is closely connected with the already mentioned Nordag Company. As for the Norsk Hydro, the French Société Norvégienne de l'Azote was compelled to sell its holdings in that concern to I. G. Farben, which thus, in fact, gained control of Norsk Hydro. For the development of artificial fibre production in Norway, the A/S Norsk Cellulose Fabrik was founded, with a capital of 10 million kroner, jointly by the Norwegian Company, A/S Borregaard, and the German Phrix concern of Hamburg.



# Rhineland Chemical Industry

## German Chemical Centres Captured

WITH the allied armies sweeping over the Rhine, the communiqués naturally provide a long list of place names well-known for their importance in the industrial system of Western Europe. Among these, Ludwigshafen and Frankfurt, just entered by General Patton's rapidly advancing tanks, are both famous as centres of Germany's chemical industry. Ludwigshafen, with a population of 150,000, is concerned in the production of practically all descriptions of chemicals, being the site of the enormous Badische Anilin Werke of the I.G. and of the Oppau nitrogen plant. The former is one of the largest and most important chemical plants in the Reich, stretching for nearly three miles along the west bank of the Rhine as far as Oppau, and was considerably expanded in recent years. It produces acids, dyestuffs, synthetic oil, ammonia, and fertilisers, as well as plastics, and contains many important research laboratories. Other important plants in the area are the Chemische Fabrik Buckau A.G., the Raschig phenol plant.

In the northern area of Mannheim, on the east bank of the Rhine opposite Ludwigshafen, cellulose products were turned out on a large scale by the Zellstoff Fabrik Waldhof and here are also many smaller chemical and pharmaceutical units. Downstream, Mainz is the seat of Kalle & Co. A.G., a subsidiary of I.G., the chief German manufacturer of transparent and other plastics. Not far away is Darmstadt with 110,000 inhabitants, where the principal industrial plant, E. Merck & Co., is a leading manufacturer of fine chemicals, while in the suburb of Ober-Ramstadt, Rohm & Haas A.G., in addition to making chemical and pharmaceutical products, is Germany's chief source of toughened glass.

### Frankfort and the I.G.

Frankfort, the largest city in Hesse-Nassau, with over 500,000 inhabitants, is often called the centre of Germany's chemical industry, this being due to the fact that the I. G. Farben have their administrative headquarter in the so-called "I. G. Hochhaus," a modern building in the western section of the town, where more than 3000 officials—said to be the brains of Germany's chemical industry—have been housed.

The largest plants in the area are those of the I.G. at Höchst and Griesheim, some 5 miles west of the town; these are just two out of the combine's 200-odd plants, other important establishments in the area being at Ludwigshafen, Merseburg, Leverkusen, Bitterfeld, Elberfeld, and Marburg.

Furthermore, Frankfort is also the seat

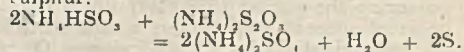
of the "Degussa" chemical concern (Deutsche Gold und Silber Scheideanstalt), and of the Metallgesellschaft A.G., a large chemical and non-ferrous metal company, while no less than 200 other chemical plants are located in the immediate neighbourhood. At Hedderheim, a north-eastern suburb, is the important non-ferrous metal works of the Vereinigte Deutsche Metallwerke. Although the allied bomber offensive, and the attempted evacuation of key industries to other parts of the country may have changed the structure of the Rhineland's chemical and allied industries to some extent, there can be no doubt that until yesterday it was the centre of Germany's chemical power.

## Removal of Sulphur Oxides

### Useful Products from Exit Gases

**S**PEAKING on "The Removal of Oxides of Sulphur from Exit Gases" at a meeting of the North-Western branch of the Institution of Chemical Engineers at Manchester on March 7, Mr. J. P. V. Woollam and Mr. A. Jackson noted that in the process described, oxides of sulphur in gases from contact acid plants were absorbed in gasworks liquor until the liquor contained 45 per cent. of salts, and that useful products were obtained by heating the liquor.

Preliminary experiments proved that the exit gases could be purified by ammonia solution of pH less than 7, that corrosion of mild steel was prevented by keeping the solution at a pH above 5, and that a liquor circulation of 0.2 to 0.6 lb./cu. ft. of gas removed sulphur dioxide when it was present at a concentration of 0.2 to 7 per cent. in the gas, the absorption being about 98 per cent. efficient. The experimental results were applied to the treatment of 300,000 cu. ft./hour of exit gases, which were scrubbed by concentrated gasworks liquor circulated through a tower by a pump. When the salts in the liquor were at 45 per cent. concentration, part of the liquor was continuously filtered to obtain crude Prussian blue, and the filtered liquor was replaced by ammonia solution. The filtrate was heated under pressure in a lead- and brick-lined autoclave to give ammonium sulphate and sulphur.



The ammonium sulphate solution of 35 per cent. strength was heated in a single-effect salting-out evaporator made of acid-resisting alloys. Ammonium sulphate was removed from the salt-box, centrifuged, and dried, about 5 cwt./hour being obtained.



## Richard B. Pilcher

**M**R. RICHARD BERTRAM PILCHER, O.B.E., F.C.I.S., is retiring on March 31—a few days after his 71st birthday—from the office of Registrar and Secretary of the Royal Institute of Chemistry, which he has held since 1900. He first entered the service of the Institute as a boy of 18 in the year 1892, when both the Institute and the profession of chemistry were young and struggling for recognition. At that time, there were only 825 Fellows and Associates and 43 Registered Students of the Institute. At the present date there are over 9200 Fellows and Associates and over 1000 Registered Students. These figures give a measure of the development of the profession which is in no small degree due to Mr. Pilcher's own personal efforts and influence.

To those who have had the privilege of intimate association with Mr. Pilcher in his day-to-day work, perhaps his most striking characteristic is his intense and sensitive humanity. Up to the time of the war of 1914-18 he used to pride himself on knowing every member of the Institute personally. That is no longer possible, but the

many who have had occasion to seek his advice on individual matters could bear witness to his flair for interesting himself vitally in the problems of others.

The technical Press owes him a perennial debt of gratitude for the unflinching courtesy with which he supplied information on the doings of the Institute and its members, much of which was not to be obtained without painstaking research into the Registrar's precious archives.

In February of this year, past and present Members of the Council of the Institute entertained Mr. and Mrs. Pilcher at a luncheon. Had it not been for the war, doubtless many hundreds would have wished to join the company to do them honour.

Although Mr. Pilcher is retiring from his active duties, he still hopes to bring the "History of the Institute" which he wrote (covering the period 1877-1914) up to date; he is at present engaged on a new edition of his original book "What Industry Owes to Chemical Science" which is now in preparation and will consist of articles by 50 collaborators distinguished in various branches of chemical work. His interest in the history of chemistry extends to the collection of old prints, chiefly of alchemists

and of early leaders in the science, of which he owns an unrivalled collection.

To members of the profession of chemistry he has been chiefly known as the "Head of our own Civil Service," but in his own profession, that of secretary, he rose to eminence, being president of the Chartered Institute of Secretaries in 1926-27.

A few biographical details may be of interest to his many friends in the chemical industry. R. B. Pilcher was born at Patric-bourne, near Canterbury in Kent, on March 23, 1874, the son of Herbert Edward Pilcher, land agent to the Marquess Conyngham. In 1892 he became clerk with the Institute of Chemistry, and soon rose to be assistant secretary (1894) and secretary (1895). His present appointment of Registrar and Secretary dates from 1900. In 1899 he married Violet Frances, daughter of George Alfred Sims, land agent to Baron Ferdinand de Rothschild; they have two sons and one daughter.

In the war of 1914-18, Pilcher was secretary of the Glass Research Committee co-operating with the D.S.I.R., and he was later (1918-20) a member of

the Officers' Resettlement Committee. His other appointments are legion: from 1918 to date, member of the Headmasters' Employment Committee, Ministry of Labour; 1935 to date, member of the Parliamentary and Scientific Committee (vice-president, 1943); 1935-43, hon. secretary, Chemical Council; 1942 to date, member of the Joint Council of Professional Scientists. In his own profession, he obtained the rank of F.C.I.S. in 1896, was a member of Council of the Chartered Institute of Secretaries in 1908, vice-president in 1924-26 and president in 1926-27, and he was the first president of the Chartered Secretaries' Students' Association. He is a vice-president (past chairman of Council) of the Association of Men of Kent and Kentish Men.

Besides the books already mentioned, he is the author of that invaluable work "The Profession of Chemistry," which reached its fourth edition in 1938, of "Official Chemical Appointments" (9th ed., 1937). "Chemistry as a Career," "Alchemists and Chemists in Art and Literature," and "A Century of Chemistry: from Boyle to Priestley," besides articles in "The Secretary" and the Institute's own journal.



Mr. R. B. Pilcher.



## Personal Notes

BRIGADIER L. H. MAOROBERT has been appointed a director of Cerebos, Ltd.

MR. R. HUMBLE has been elected to the board of Trinidad Consolidated Oilfields.

MR. ROBERT WILLIAM RUTLEDGE, of Birmingham, has been appointed a director of British Benzol and Coal Distillation.

MR. R. F. SPEIR has been selected as a director both of the Associated Portland Cement Manufacturers Co. and of the British Portland Cement Manufacturers Co.

MR. J. STANLEIGH TURNER has been elected vice-president of the Institute of Fuel, in place of MR. H. A. HUMPHREY, who has resigned.

DR. ARTHUR C. COPE has resigned as associate professor of chemistry in Columbia University to become professor in charge of the organic chemistry division at the Massachusetts Institute of Technology.

MR. FRANK SAVAAGE, M.A., B.Sc., A.R.I.C., has been appointed assistant managing director of the Anchor Chemical Co., Ltd., in succession to Mr. T. Martin, who is now managing director.

MR. E. PLAYER, technical director of Birmid Industries, Ltd., has been appointed joint managing director of that company and also of the Birmingham Aluminium Casting (1903) Co., Ltd., a subsidiary. Mr. Player will act with Mr. Cyril C. Maudslay, who continues as chairman and joint managing director of both companies.

MR. THOMAS WOODFORD SMITH, A.R.C.Sc., of Canadian Industries, Ltd., has been elected chairman of the Canadian Council of the Society of Chemical Industries, in succession to Dr. R. S. Jane. A native of Dublin, Mr. Smith went to Canada in 1912 after a period as science master at Magnus Grammar School, Newark-on-Trent. He entered the service of Canadian Explosives, Ltd., and did important research and development work at the Belœil and Nobel plants of that company. In 1929 he was appointed first assistant manager of the chemical development department of Canadian Industries, Ltd., and in 1930 manager of the new patent department. Since 1940 he has been on the management committee of C.I.L.

## Obituary

MR. ROBERT CRAIG SHARP, who died recently at Strone, Argyllshire, was a well-known figure in the Scottish chemical manufacturing industry.

MR. GEORGE DUNCAN MCINTYRE, who died at Montreal on January 2, aged 63, went from Scotland to Canada in 1907 to establish the first Canadian refined glycerine plant for Lever Bros., Ltd., at Toronto.

We regret to announce the death on March 24, at Beaconsfield, Bucks., of Mrs. M. L. RAISTRICK, the wife of Professor Harold Raistrick, F.R.S., F.R.I.C.

MISS RUBY CAROLINE GROVES, M.Sc., F.R.I.C., whose death on December 15, 1944, is announced, had been on the staff of the Mineral Resources Department, Imperial Institute, since 1918, and was Senior Assistant there since 1930. She was a recognised authority on soil analysis, having made a special study of chemistry in relation to botany. In 1934 she was elected Fellow of the Royal Institute of Chemistry.

## Society of Public Analysts

### 70th Anniversary Meeting

AT the annual meeting of the Society of Public Analysts and Other Analytical Chemists held at Burlington House on March 9, which marked the seventieth anniversary of the Society, it was recorded that the membership had increased by 117 to 1197. In pursuance of the policy decided upon a year ago, the Society had formed two groups concerned with particular branches of analysis, *viz.*, the Microchemistry Group (chairman, Professor H. V. A. Briscoe; hon. secretary, Mr. R. Belcher; present membership, 143) and the Physical Methods Group (chairman, Mr. R. C. Chirnside; hon. secretary, Dr. F. Wokes; present membership, 115).

The proceedings terminated with the presidential address of the retiring president, Mr. S. E. Melling, who, after reviewing some of the outstanding events of the past year in the Society's affairs, made some observations on water and water supplies.

The Electrodepositors' Technical Society have published, in book form, Vol. XIX of their journal, covering the proceedings for 1943-44. The volume is obtainable by non-members, price 21s., from the hon. secretary of the Society, at the Northampton Polytechnic, St. John Street, London, E.C.1. The present volume contains a report of the annual meeting and ten papers, including Dr. J. R. I. Hepburn's presidential address on Alloy Deposition, which he described as, in a sense, a tardy celebration of the centenary of de Ruoltz's first electrodeposition of brass in 1841. Of particular interest to industrial chemists are Mr. H. Silman's paper on "Wetting Agents—their Use in Electroplating and Allied Processes" and Blow, Hiscox, and Smith's investigation of "The Estimation of Ammonia in Electrolysed Cyanide Plating Solutions." The papers are fully illustrated with diagrams and photographs, and the editor, Dr. S. Wernick, is to be congratulated on another excellently produced volume.



## Parliamentary Topics

### China Clay Exports

**I**N the House of Commons last week, both Mr. Petherick and Major Studholme had put down questions to Mr. Dalton about the resumption of the export trade in china clay and ball clay, and the tonnages of demands which could not be fulfilled owing to shortage of labour and shipping.

Mr. Dalton said that he was doing everything possible regarding the needs of this valuable export industry. Four closed china-clay pits had recently been re-opened and firms were given facilities to acquire new plant and to send representatives overseas. It was impossible to estimate how much business had been lost owing to diversions to the war effort. Mr. Dalton added that he would be very glad to see the leaders of the industry and that he was anxious to secure a proper balance between the development of the pottery industry and the export of clay.

### Penicillin

Mr. Wootton-Davies asked the Secretary of State for the Colonies the extent to which penicillin was now obtainable in the various British Colonies.

Colonel Stanley: Supplies of penicillin are now available from the United Kingdom, the United States of America, or Canada, as is most convenient, for civilian use on the same basis as in this country. Briefly, this permits the treatment of all civilian cases for which penicillin is known to be effective.

### Trinidad Oil Development

Dr. Morgan asked the Secretary of State for the Colonies whether his attention had been drawn to the fact that in the near future 30,000 acres of oil-bearing lands in Trinidad, including Government leased land, would pass under control and ownership of the National Mining Corporation for exploration, drilling and development.

Colonel Stanley: The Governor has not yet given his consent to the transfer of the Crown leases concerned. I am unable to say whether the capital and directorate of the Corporation is wholly British. No change in the law is contemplated, as the bulk of the oil produced comes from Crown oil rights, and the royalties accrue to the Colonial Government.

### Geological Work in the Colonies

Replying to Colonel Lyons, Colonel Stanley said that he had recently received a report by a Committee appointed early last year to consider the needs for geological work in the Colonial Empire, and the best organisation to carry it out. The report was referred to the Colonial Govern-

ments, and he was awaiting their views before reaching a decision.

### Scientific Research Workers

Mr. McEntee asked the Minister of Labour if he was aware that many scientists were concerned about the Report of the Committee on Higher Appointments set up by him in July, 1943, fearing that the proposed new appointments department would limit the freedom of research workers in pure science; and whether he would give an assurance that research workers, after the war, would be free to choose where, and on what subjects, they would carry out their research.

Mr. Bevin replied that he was not aware of any such concern, nor was he in a position to say what the Government's policy would be after the defeat of Japan. In any case, his Scientific Advisory Committee would be consulted before questions of policy were determined.

### Research Expenditure

Replying to Mr. Leonard, Mr. Attlee gave these figures for the expenditure of the D.S.I.R. for the financial years 1935-1939: gross expenditure, £4,387,500, net expenditure, £3,127,990; for the financial years 1940-1944 (1944-45 revised-estimates): gross expenditure, £5,900,405, net expenditure, £3,505,783.

### Ceylon Cement Manufacture

Captain Gammans asked the Secretary of State for the Colonies whether the manufacture of cement in Ceylon was to become a Government monopoly; whether it was proposed to raise the import duties on cement; and what would be the estimated percentage increase in the purchase price of cement.

Colonel Stanley: I understand that the Ceylon Government proposes to seek expert advice on the technical aspects of the establishment of cement manufacture in the island, and that until the expert's report is available to them no decision will be taken on protective duties or other questions of policy.

### Oil Concessions in Persia

Mr. Eden told Mr. Woodburn that no oil concessions had been obtained in Northern Persia by British, American, or Soviet interests since the present war began.

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The Bor mine in Serbia, one of the richest copper mines in Europe, is again being worked, according to the Yugoslav News Agency, quoted by Reuter. Workers on their own initiative repaired the damage caused by the retreating Germans, who were prevented from carrying out all the planned demolition. Production in 1939 was 986,999 tons.



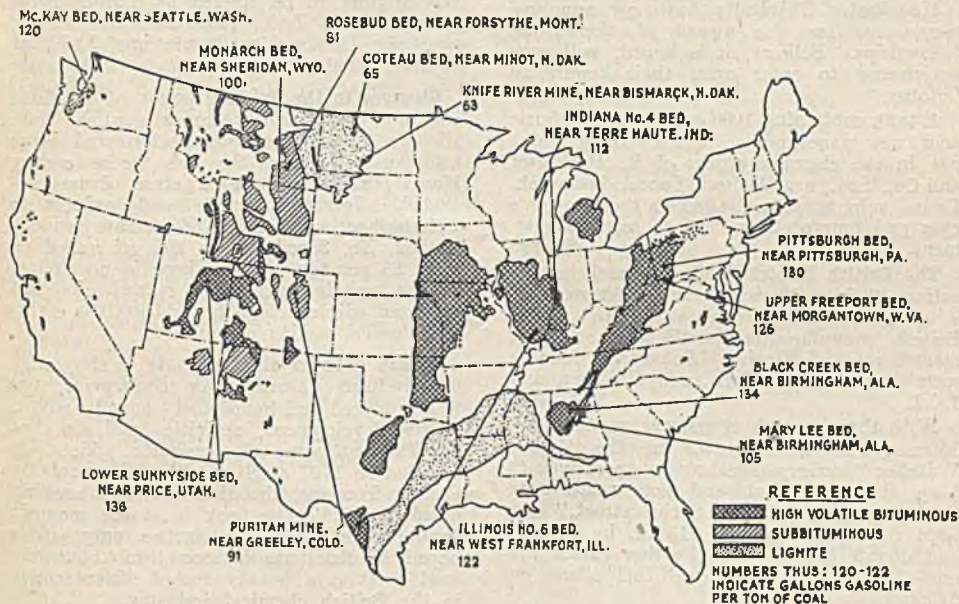
# Oil from Coal in the United States

A Bureau of Mines Survey

**I**N Dr. G. E. Foxwell's review of the progress of the fuel and carbonising industries in 1944 (*THE CHEMICAL AGE*, January 13, 1945, p. 58), reference was made to the hydrogenation of coals in the United

laboratory, only three, one from Pennsylvania, one from Alabama, and one from Utah, rendered yields of 130 gal./ton or over.

The sub-bituminous coals and lig-



States. The accompanying map illustrates the work of the U.S. Bureau of Mines on hydrogenation, and gives some details of the yields of oil from various American coals. Of the coals tested in the Bureau of Mines

as might be expected, returned noticeably lower yields of oil than the high-volatile bituminous coals. Further details are available in Bureau of Mines Information Circular No. 7190.

## French Chemical Notes

### Soap Factories Lack Raw Materials

**L**AATEST production statistics show that the French chemical industry is still far from its pre-war level of activity. In January the output of ammonia and cyanides was 50 per cent. of 1938, that of nitrogen, chlorine, and caustic soda 30 per cent., that of hydrochloric acid 25 per cent., and that of sodium carbonate 20 per cent.

St. Gobain has issued 300,000,000 fr. of 3½ per cent. debentures at 97.2 per cent., and two viscose companies—La Viscose Albigeoise and Société de la Viscose Française—have asked their shareholders for an authorisation to issue debentures for sums not exceeding 50,000,000 fr. and 100,000,000 fr. respectively. Produits Chimiques et Engrais d'Auby report that the plant has not suffered any damage as a result of military operations. The financial year ended

June 30 is described as satisfactory. The net profit of 8,463,762 fr. permitted the distribution of a 30 fr. dividend.

Shortage of oil seeds, olives, etc., is largely responsible for the inability of the French soap factories to supply the full quota needed for the rations. Supplies of oleaginous fruit in 1944 were only 4000 metric tons, while the rations are based on minimum deliveries of 8000 tons. Before the war as much as 200,000 tons of various fatty substances were used.

The director-general of the Société Commerciale des Potasses and of the Mines de Kali Ste. Thérèse have joined the board of Produits Chimiques de Tessenderloo, the Belgian fertiliser and chemical concern, which is now co-operating closely with Produits Chimiques de Limbourg.

## General News

## From Week to Week

The annual general meeting and election of officers of the British Fluorspar Producers Association will be held at the Crown Hotel, Matlock, on April 11 at 2.30 p.m.

Manchester University has now approved regulations for the award of the I.C.I. fellowships. Fellows, it is hoped, will soon be elected to enter upon their tenure in October.

A tank containing 1000 gallons of sulphuric acid was punctured in a fire which broke out in the chemical works of E. P. Potter and Co., Ltd., near Bolton, Lancs., last week. Dense sulphur fumes affected the firemen's eyes and four of them had to receive treatment.

The British Export Trade Research organisation ("Betro") was formed last week as a non-profit making organisation to provide British manufacturers with a world-wide market research service. Among the founder members are Lever Bros. and Unilever, and I.C.I.

With the approach of warmer weather, the Ministry of Fuel poster in the "Fuel Watcher" series, appealing to operatives to keep the door shut and not waste heat through trying to "heat the street," has been reprinted in crown (15 in. by 10 in.) and double crown size. Further copies are now available from regional fuel offices on demand.

Large untouched reserves, in Scotland, of potential economic materials, such as dolomite, quartzite, and peat, were referred to by Dr. M. Macgregor, assistant director of the Geological Survey, at the Edinburgh City Business Club last week. He said the survey dealt with about 700 inquiries a year, by far the greatest number in connection with Scottish economic problems.

The Board of Trade announce that all policies under the Business Scheme which are in force on March 31 will be extended until June 30, 1945, without further payment of premium, or further action on the part of policy holders. For new or additional insurance under the scheme the rate of premium for the three months April 1 to June 30, 1945, will be 1s. 8d. per cent. with a minimum premium of 5s.

Lord Simon's main point, in his reply to Lord Vansittart, who raised the question of enemy patents in the House of Lords on March 22, was that patents and patent applications, lodged in Britain by the enemy, were not likely to revert to enemy countries after the war. Further, there has been great use, by our industrialists, of enemy patent specifications made public under the Patents Emergency Act.

Thirty schemes for new factories and extensions to existing units were outlined by Mr. Dalton at Newcastle on March 26. They include a factory for asbestos spinning at Washington, to be erected by Turner Bros. Asbestos Co., Ltd., Rochdale, and a new plant for De La Rue Insulations, Ltd., at West Chirton, Tynemouth.

Changes in the existing prices of unrefined oils and fats and technical animal fats allocated to primary wholesalers and large trade users during the five weeks ending May 5, are (per ton ex store, drums included): Sperm oil, crude heads reduced to £54, blubber reduced to £54, carcase reduced to £52, No. 3 reduced to £51 (if naked ex tank £3 per ton less). There is no change in the existing prices of refined oils and imported edible animal fats during the eight-week period ending May 26.

Acacia gum to zinc sulphate is the range of products described in *Enterprise*, the well-produced and handsomely bound account of the development, activities and aims of the Tennant group of companies, which was founded in 1797 at St. Rollox, Glasgow, by Charles Tennant, the discoverer of bleaching powder. While the book is at the moment available in limited quantities only, it is hoped to distribute it soon throughout the world. It is a worthy record of enterprise in the British chemical industry.

The current position of every Government factory which has been declared surplus to future munitions production is typical of the information on post-war industry which is available in the Location of Industry Planning Room at the Millbank offices of the Board of Trade, which was referred to by the President of the Board of Trade in the House of Commons last week. Prospective factory builders will find much more topographical and statistical information at the same address.

An unusual magnesium fire is reported from Ben Rhydding, Yorkshire. A 12-year-old boy had apparently been playing with magnesium turnings in an outbuilding attached to the engineering works of Ross Brothers, Ltd., and in some way the turnings had become ignited. The boy's parents and a passing motorist wrapped a rug round him and he was driven off to Ilkley Hospital, where the clothes were found to be still burning, as might have been expected. Mr. Gilbert Ross, a director of the firm, pointed out that a supply of french chalk for extinguishing such fires was kept at hand. Workpeople from the factory put out the fire in the outbuilding before the fire brigade arrived.



## Foreign News

**Aluminium Français** is reported to be issuing 4 per cent. debentures to the amount of 100,000,000 francs at 98.6 per cent.

The cultivation of pyrethrum on the Nyika plateau of Nyasaland is now beyond the experimental stage and satisfactory yields have been harvested.

A new Swedish-English technical dictionary (250 pages), edited by Einar Engström, is obtainable from Svensk Trävaru-Tidnings Bokförlag, Kungsgatan 17, Stockholm, price 25 kronor.

Spain produced in 1944 120,000 metric tons of potassium salts compared with 87,000 tons in the preceding year and 95,000 tons in 1942. Last year's output thus almost reached the level of the years before the civil war.

In the Sudan, a licence has been granted for the construction of a glass factory, while the possibilities for the manufacture of cement, bricks and tiles are under investigation.

The first section of the new iron and steel works at Krasnoyarsk, where the Trans-Siberian railway crosses the Yenisei river, has gone into operation. The completed plant will cover an area of 120 hectares.

Production of crotonic acid in commercial quantities by a new process developed by Shawinigan Chemicals, Ltd., has recently started. The new unit's capacity is 120,000 lb. yearly.

The Swedish Universities Relief Committee has recently been formed by 40 representatives of Sweden's universities, technical high schools and scientific institutions to prepare active help to universities in countries ravaged by the war.

The replacement of German chemicals, scientific equipment and apparatus, as well as of educational material, in the Latin American states, to expand U.S. foreign trade, is intensively being studied, said Mr. A. E. Taylor, director, U.S. Bureau of Commerce.

New vitamin plants are being brought into production in the Soviet Union, including a plant for vitamin A in Bashkiria, and combines under construction in Kirghizia and Leningrad. Several damaged plants have already been restored. The value of output amounted to 12 milliard rubles last year, an increase of 5 milliards over 1943.

The resumption of imports of shellac on private account from India to the United Kingdom is to be permitted, subject to the India Lac Export Control Order, 1944, as from March 31, when the Ministry of Supply will cease to purchase shellac in India on public account. Import licences will still be necessary.

In Denmark, production of penicillin, marketed as "Leopenicillin," has been taken up by the Löven Kemiskofabrikers of Copenhagen. Present output suffices for about 200 treatments monthly, it is reported.

A process for making solutions of acetyl peroxide which are perfectly safe to handle has been developed in the U.S. by the Buffalo Electro-Chemical Company. Technical press reports state that the product now available is a 30 per cent. solution of acetyl peroxide in dimethylphthalate. This solution is a water-white, non-explosive liquid, immune to shock and impact.

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## Forthcoming Events

**April 4. Society of Public Analysts and Other Analytical Chemists.** Chemical Society's Rooms, Burlington House, Piccadilly, London, W.1, 5 p.m. Mr. F. J. Macdonald: "The Freezing Point of Sour Milk"; Dr. H. Liebmann and Mr. A. D. Ayres: "The Electrometric Determination of Ascorbic Acid"; Mr. H. W. Webb: "Magnetic Stirring in the Electrodeposition of Metals."

**April 6. Institute of Physics (Scottish Branch).** Natural Philosophy Department, University of Glasgow, 7.30 p.m. Dr. W. Hume-Rothery, F.R.S.: "The Theoretical Interpretation of Alloy Structures."

**April 6. Institute of the Plastics Industry (North-Western Section).** Engineers' Club, Albert Square, Manchester, 6.30 p.m. Captain Hertel (Technical Division, Chemical Warfare Service, U.S. Army): "Commercial Testing of Plastics in the U.S.A." (with special reference to the testing and control laboratories in manufacturing plants).

**April 7. British Association of Chemists (St. Helens Section).** Radiant House, St. Helens, 7.30 p.m. Dr. N. Thorley: "X-rays in Industry."

**April 7. Institution of Factory Managers.** Bonnington Hotel, Southampton Row, W.C.1, 2.30 p.m. S.E. London branch meeting.

**April 9. Society of Chemical Industry (London Section).** Rooms of the Chemical Society, Burlington House, Piccadilly, London, W.1, 2.30 p.m. Dr. A. Parker (Director of Fuel Research): "Coal, Science, and the Future."

**April 11. Electrodepositors' Technical Society (Birmingham Section).** James Watt Memorial Institute, Great Charles Street, Birmingham, 3, 6.45 p.m. Mr. S. Wernick: "The Plating Shop, Plant and Lay-out."

**April 12. Institute of Fuel.** Annual meeting, City and Guilds Engineering College Lecture Room, Exhibition Road, London, S.W.7, 2.30 p.m.

**April 12. Society of Chemical Industry and Institute of Metals** (London Sections). The Institution of Mechanical Engineers, Storey's Gate, London, S.W.1, 7 p.m. Mr. A. R. Powell: "Minor Metals."

**April 13. Society of Chemical Industry** (Plastics Group, and Birmingham and Midland Section). Chamber of Commerce, New Street, Birmingham, 6.30 p.m. Dr. K. W. Pepper and Dr. F. T. Barwell: "Fabric-Base Plastics."

**April 13. Institution of Chemical Engineers.** Annual meeting, Connaught Rooms, Great Queen Street, London, W.C.2. 11 a.m., Business session (corporate members only). 12 noon, President's address: "A Byway in Chemical Engineering." 1 p.m., Luncheon (principal speaker, Sir Stafford Cripps). 3 p.m., Mr. H. W. Cremer and Mr. R. L. Pitt: "The Siting and Lay-out of Industrial Works." Those desiring luncheon are requested to notify the secretary not later than April 5.

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## Company News

**The United States Gypsum Co.** reports a trading profit for 1944 of \$9,702,999 (\$12,195,131); net profit amounts to \$4,237,187 (\$5,038,450); an unchanged dividend of \$2.00 on common was declared.

**The United Glass Bottle Manufacturers Co., Ltd.**, is paying a final dividend of 6 per cent., which, together with the interim of 3½ per cent., and the bonus of 2½ per cent., makes a total distribution of 12 per cent.

**The Canadian Eagle Oil Company, Ltd.**, reports an oil trading profit, for the year 1943, of £121,387, compared with a loss of £28,165 in 1942. The ordinary dividend is maintained at 6d.

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## New Companies Registered

**Vermiculite (London), Ltd.** (391,097).—Private company. Capital, £100 in £1 shares. Mining engineers, mine owners, metallurgists, manufacturers of and dealers in paints, oils, glass, hardware, etc. Directors: A. T. Dunn; R. J. Nicol. Registered office: 30 Budge Row, London, E.C.4.

**Ferguson and Poynter, Ltd.** (23,192).—Private company, registered in Edinburgh. Capital, £13,500 in £1 shares. Manufacturers, merchants and agents for all kinds of chemicals, fertilisers, feeding stuffs, etc. Directors: G. T. Macleod; J. H. C. Macleod; J. McLaren. Registered office: 45 Haggis Road, Glasgow.

**Tanoplastics Research, Ltd.** (394,139).—Private company. Capital, £100 in £1 shares. Manufacturers of and dealers in

leather and tanning materials, chemicals, dyestuffs, pigments, rubber, plastics, lacquers, etc. Subscribers: H. G. Barlow, D. Ross. Registered office: 108a Cannon Street, E.C.4.

**Efril (Manchester), Ltd.** (394,021).—Private company. Capital £10,000 in 5000 preference and 5000 ordinary shares of £1 each. Manufacturers of varnish, enamel and paint, oil boilers and refiners, colour makers, glass manufacturers, etc. Directors: H. Monks; J. E. Scott. Solicitors: Bulcraig and Davis, London, W.C.2.

**British Siporex Company, Ltd.** (393,919). Public company. Capital £150,000 in £1 shares. To acquire from Internationalla Siporex A/B all or part of its interest in the process of manufacturing from cement and sand an artificial stone known as "Siporex," etc. First directors: Sir Percy Stewart, Bt., chairman, London Brick Co., Ltd.; N. M. Jensen, chairman, Tunnel Portland Cement Co., Ltd. Registered office: Africa House, Kingsway, London, W.C.2.

**Wood Chemicals, Ltd.** (394,102).—Private company. Capital, £5000 in 5000 £1 shares. To acquire departments of the businesses of Ernst B. Westman, Ltd., and F. W. Berk & Co., Ltd., which deal in liquid resin and wood distillation products. Directors: A. W. Berk, C. R. F. Berk, L. A. Plummer, all of F. W. Berk & Co., Ltd.; K. T. S. Stromwall (Swedish), chemical merchant; E. S. W. Westman, director, Ernst B. Westman, Ltd. Solicitors: Cosmo Cran & Co., London, E.C.3.

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## Chemical and Allied Stocks and Shares

**B**USINESS in stock markets has continued on a small scale, attention being centred on the war news. Nevertheless, gilt-edged stocks remained firm, aided by satisfaction with the terms of the big Australian conversion. Where changed, leading industrial shares showed small gains. Imperial Chemical were steady at 39s. 4½d. awaiting the dividend announcement, and Turner & Newall kept firm at 86s. with Lever & Unilever steady at 47s. 6d., while market dividend estimates were reflected by a further gain in British Oxygen at 89s. 9d. Prior to the meeting, which was awaited with considerable interest for any further references to the recent cut in the price of the metal, British Aluminium eased to 44s. 7½d. Courtaulds at 55s. 4½d. strengthened on the company's post-war plans. Dunlop Rubber showed firmness at 49s. Murex were higher at 101s. 3d., but Radiations further receded to 58s. 3d., while Ruston & Hornsby were better at 52s., and



- Are all steam pipes well insulated?
- Is there an air leakage?
- Are all valves in order?
- Is the damper control efficient?

## DON'T CLAIM THAT YOUR PLANT IS IN ORDER

*until you've  
read this—*



Fuel Efficiency Bulletin No. 38—  
“*The Maintenance of Industrial Boiler Plant*”—just out—offers under one cover much useful information. It not only lists many common and uncommon maintenance problems, but describes how to deal with them. It is a handbook for the man on the job—it is up to management to see he gets it.

This Bulletin has been prepared from the practical experience of Regional Fuel Efficiency Committees. The following shows what economies can be made.

**A LARGE INDUSTRIAL PLANT** consuming about 800 tons of coal per week. As the result of air infiltration, the  $\text{CO}_2$  value was only 3.5—5%. Fan power had to be stepped up to maintain draught actually causing boiler vibration. Elimination of air leaks and short circuiting, together with improvements to lagging and firing standards, resulted in a 30% saving in fuel and also better steaming conditions.



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*Additional copies of the Fuel Efficiency Bulletins and Fuel Watchers' badges can be obtained from the Regional Offices of the Ministry of Fuel and Power.*

Birmid Industries good at 92s. Triplex Glass, however, eased to 42s.

William Blythe 3s. shares showed more dealings than for some while past, and transferred up to close on 10s. The company has an excellent dividend record, and the distribution for the past year is being raised to 20 per cent. by the addition of a 5 per cent. bonus. B. Laporte marked 87s. 3d., and International Combustion shares were dealt in at over £8. British Glues 4s. shares have been more active around 9s. 6d. Cellon 5s. ordinary marked 25s., Fisons 51s., and Leeds Fireclay preference 15s. 9d. De La Rue at £11 1/16 were higher on balance, while there was activity up to 6s. 10½d. in British Industrial Plastics 2s. ordinary, and Erinoid 5s. shares kept firm at 12s. United Glass Bottle at 75s. were unchanged on the results. Forster's Glass 10s. ordinary remained at 38s. and, as usual, were firmly held. General Hydraulic Power ordinary stock was a good feature, rising sharply to 94 on the dividend of 5 per cent., compared with the previous year's 4 per cent.

Among iron and steels, Dorman Long showed firmness at 27s. 1½d. on the chairman's annual statement, while, awaiting the results, Stewarts & Lloyds deferred have been steady at 57s. 6d. Tube Investments changed hands slightly over £5½; United Steel at 26s. 9d. regained an earlier small decline; and there has been activity around 12s. in Millom & Askam Iron pending the dividend declaration. Baldwins (Holdings) firmed up to 6s. 3d. on the results and annual statement. Babcock & Wilcox were again better at 53s. 9d., Staveley were steady at 53s. 6d., Lancashire Steel "A" shares were 25s., and William Beardmore firmed up to 27s. 9d., but South Durham steel reacted to 29s. on the lower profits.

Elsewhere, British Plaster Board continued active around 39s. 6d. Associated Cement have been steady at 61s. 3d. Crittall Manufacturing strengthened to 32s. 3d., and Rugby Cement 5s. shares improved to 11s. 3d. on the results. British Drug Houses were more active around 30s. 3d., and elsewhere, Boots Drug remained steady at 56s. Monsanto Chemicals 5½ per cent. preference changed hands around 23s. Greiff-Chemicals Holdings 5s. shares marked 9s. 3d., and Morgan Crucible 5 per cent. second preference 24s. 10½d. British Tar Products 5s. shares were 10s. 9d., while British Emulsifiers 2s. shares have been dealt in up to 3s. 7½d. British Match firmed up further to 41s. 9d. Borax Consolidated deferred were steady at 39s. 9d., pending the full results and annual statement. General Refractories 10s. ordinary were well maintained at 16s. 9d., while Barry & Staines at 53s. 9d., and Nairn & Greenwich at 77s. 6d. remained firm.

International Nickel showed moderate fluctua-

tions in sympathy with dollar stocks, but at 39½ were little changed following publication of the annual report. The chairman points out that the company should not have any serious post-war reconversion problems, that much has been gained from war-time research, and that commercial sales of nickel will continue to expand. Oil shares were better, with Burmah Oil 86s. 3d., Anglo-Iranian 110s. 7½d., and Shell 81s. 10½d.

## British Chemical Prices

### Market Reports

A MODERATE amount of new business and fresh inquiry has been reported during the week on the London general chemicals market, and steady deliveries of most descriptions are being made to consumers. Prices remain firm throughout. In the soda products section fresh inquiry is reported for bichromate of soda, while there is a continued scarcity of supplies of chlorate and yellow prussiate of soda. Glauber salt and salt cake are an active market. A good demand is reported for caustic soda and acetate of soda. Among the potash materials an active inquiry is reported for both the B.P. and commercial grades of permanganate of potash, and elsewhere in this section supplies of caustic potash, and bichromate and yellow prussiate of potash are quickly absorbed for priority needs. In other directions arsenic is a good market and a steady demand is reported for the red and white leads. Market activity in the coal-tar products section is fairly steady and there is a good call for creosote oil, carbolic acid, and cresylic acid, while there is a ready outlet for the toluols. A fair trade is passing in the pyridines and pitch.

MANCHESTER.—Both deliveries against contracts and new business on the Manchester chemical market during the past week have been adversely affected to some extent by seasonal factors—pre-holiday and end-of-March stocktaking influences—but allowing for these, trading conditions have been reasonably satisfactory. Caustic soda and the soda compounds generally are meeting with a good demand, chiefly against existing commitments, and a steady absorption of potash offerings continues to be reported. Sulphuric and hydrochloric acids are finding a steady outlet. In fertilisers generally, the seasonal movement is now on a good scale and is likely to continue at a high level during the next month or so. The tar products, both light and heavy, are mostly in steady demand.

GLASGOW.—In the Scottish heavy chemical trade business during the past week in the home trade has been moderate. Export inquiries are becoming more numerous. Prices remain firm at previous levels.



**Price Changes**

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**Boric Acid.**—Per ton for ton lots in free 1-cwt. bags, carriage paid: Commercial, granulated, £52; crystals, £53; powdered, £54; extra fine powder, £56. B.P., crystals, £61; powder, £62; extra fine, £64.

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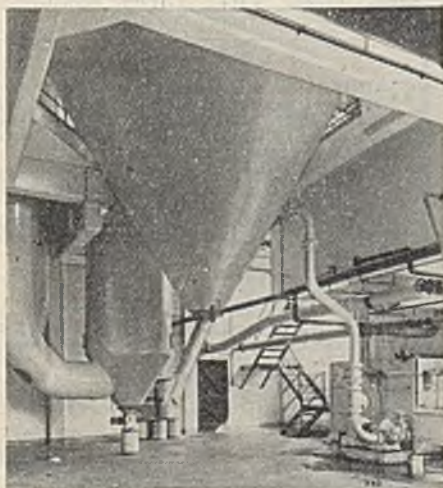
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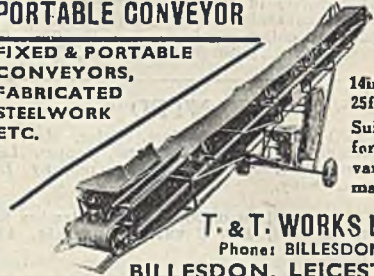
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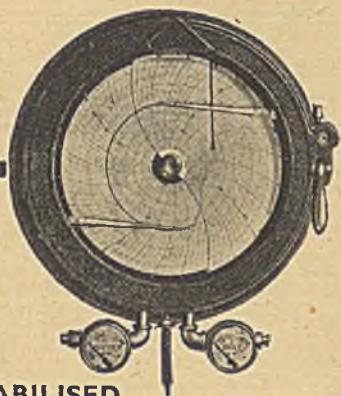
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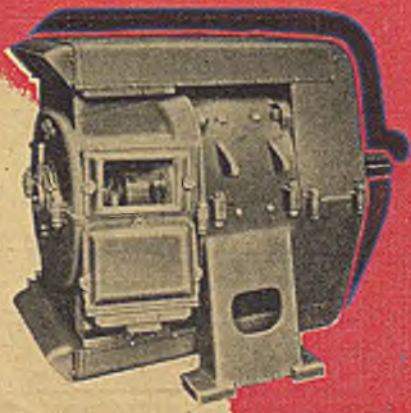
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