The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

VOL. LIII
No. 1359

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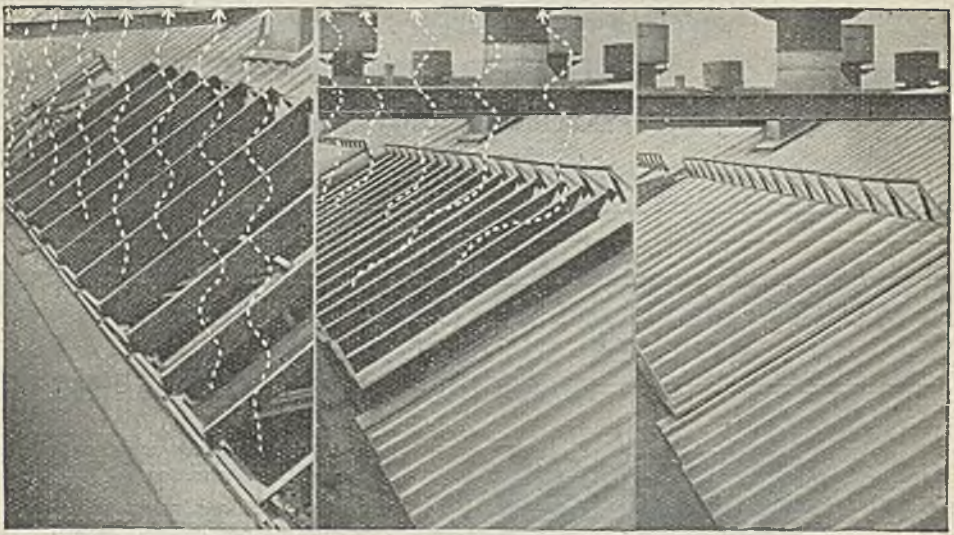

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Combines and Cartels

THE question of the concentration of industry in a comparatively few hands has been before the country for at least a quarter of a century, but attention has been particularly focussed upon it in the election speeches of politicians. It is a favourite argument in certain quarters that business combines are anti-social because they exist for the purpose of raising prices. That danger is, in effect, very small indeed. It may have been true 100 years ago and it has certainly been true on many occasions in our history. It is not true to-day because, even if the manufacture of a particular commodity is completely concentrated in one firm or group of firms, it is inevitably in competition with other commodities or with other methods controlled by yet other groups of firms. The building of houses is a case in point; it might be thought a good thing to "corner" building bricks, but if the price of building bricks were exorbitant houses would be built in concrete, in steel, in aluminium, and perhaps even in glass, while stone has been employed for centuries in many parts of England. There is competition in certain fields between glass and plastics. It is, moreover, quite easy for Governments to control prices as we have seen during the present war.

Monopolies, however they are set up, have other and more serious dangers, but they have also a good deal to their credit. Generally speaking, big businesses are more generous and humane towards labour than are the smaller businesses. It is almost universally true that they are efficient and can afford more in wages. The conditions under which their employees work are good. It may be claimed with some assurance that large combines produce more efficiently and sell more cheaply than is possible under unregulated competition. This largely arises from intelligent co-operation and the pooling of information between industrial establishments which, being no longer in direct competition, can afford to pool their resources and information.

In the opinion of Mr. Samuel Courtauld, by far the most serious danger to be apprehended from combines and monopolies is the "suppression or discouragement of new methods in the interests of already invested capital. Business directors cannot be condemned for this out of hand; it is perhaps their most obvious duty to protect the invest-

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ment of the shareholders who pay them, and they often inherit a fundamentally unsound situation for which they personally are in no way responsible. The burden of obsolete methods and machinery is frequently handed down from the greedy or short-sighted past." (*The Times*, June 22).

This "danger" strikes at the root of modern industrial practice. Is it desirable to write off a plant quickly and to replace it long before it is worn out, or should one continue to operate plants which are not as efficient as those operating in other factories? This problem is not at all easy. The technical man would immediately give his voice for modernisation; on the other hand, the accountant would point out that capital charges may be a very large slice of the cost of production and that if an older plant has had its value written off it may be producing more cheaply than a modern plant which would operate at a much higher technical efficiency. If the two plants produce a product of equal quality is not the accountant's view correct? On the other hand, if for any reason the products from the older plant are not up to standard as compared with the newer plant, it would seem that the technical viewpoint should prevail. The position is by no means clear, and the duty of protecting the investment of shareholders often demands very difficult decisions. We agree that glaring instances have been alleged in the past where inventions were bought and "sterilised" in order to prevent new and expensive plants from being rendered obsolete. Regarded from the larger angle of technical progress this practice is reprehensible, but is it so, in fact, from the angle of capital employed? To scrap an expensive installation long before it is written off, and unless there is a sufficient obsolescence fund available, may not be sound finance, however much the technical viewpoint may weigh on the scales in the other direction.

What should be done, of course, is to keep the newer process in reserve, to erect a pilot plant to study it, and to use it as soon as it becomes actuarially sound to do so. To forestall possible criticism of this view, let us state at once that we are not in favour of the ruling of business from the counting-house, but it is impossible to direct businesses, however technical they may be, without taking finance into close consideration.

Another criticism made by Mr. Courtauld is that "democratically constituted trade or industrial associations often seem to exist for the purpose of keeping numbers of weak manufacturers alive, whose obsolete methods would otherwise succumb before the advance of progress." Unfortunately, Mr. Courtauld gives no chapter and verse for this rather amazing assertion. It may be true in the industries of which he has special knowledge; we do not know. But it is quite untrue of those trade associations of which we have knowledge. It is only in regard to price-fixing associations, or associations which spread orders over the industry on an agreed basis, that this accusation could possibly be true. It will generally be found that prices are fixed, not on the basis of the highest-cost producer, but on a reasonable basis of the costs that a producer of average efficiency can be expected to obtain. There is sound reason for this procedure: it squeezes out the less efficient firms. Obviously, it is to the advantage of the efficient firms that the inefficient should disappear, for the orders will then be divided among a smaller number of firms. Consequently, an industry does not lightly suffer inefficiency among its members. On the other hand, financial considerations prevent every firm at every moment from having the latest and most modern, low-cost, high-efficiency, plant and processes. Consequently, a reasonable and not impossible standard must be taken when fixing prices.

The efficiency of labour cannot be neglected in these discussions. It has lately been pointed out by Professor Richardson of Leeds University that trade unions have mainly tried to obtain better wages for their members by securing a larger share of the returns from industry at the expense of capital, management, and customers, but that the restrictive practices applied to that end cannot be logically continued. These restrictive practices were formulated on the supposition that through reduction of productivity they gave greater security of employment. Now, as Professor Richardson points out (*The Times*,

June 23), " whatever may have been formerly the possibilities and justification for raising wages by diverting resources to labour from other sections of the community, the opportunities for doing this are now so small in consequence of changes brought about by taxation, that higher standards of living for the workers will in future depend almost entirely upon advances in industrial techniques, equipment, and organisation, and *in greater efficiency of labour.*" The italics are ours. The plain fact is that to-day labour is not pulling its weight in industry. This is not a particularised and individual criticism, it is a broad general statement that has been made to us by many engineers in many different industries. It is not the slightest use attacking capital and management and private enterprise and all the other favourite tilting horses of left-wing politicians unless two fundamental prerequisites are clearly understood: (1) that the only objective must be to make the nation's industries more efficient so that we can compete at home and abroad and maintain our standard of living; and (2) that it is just as necessary for labour to pull its weight as for the other partners in the industrial crew to do so.

NOTES AND COMMENTS

Soviet Academy's Jubilee

SEVERAL members of the group of British scientists who recently attended the 220th anniversary of the formation of the Academy of Sciences of the U.S.S.R. communicated to the Press the impressions they gained on their visit to Moscow and Leningrad. They unanimously expressed both a high appreciation of Russian hospitality (which is famous the world over) and of the work of their colleagues in Russia, who receive the utmost support and encouragement from the Soviet Government. Indeed, as the Astronomer Royal put it, one cannot help comparing the Soviet attitude to the promotion of science with that obtaining in this country. Soviet scientists work in magnificently equipped laboratories and enjoy a social status which would meet with Plato's full approval. Soviet scientists receive higher rations and better housing facilities than most other members of the community. As prevention is better than cure, they have to attend their physician once a month, and they enjoy a two months' annual holiday. Students in science subjects have not been diverted from their work during the war to take up other forms of national service. Another impression gained on this first international meeting of scientists since 1939 is the fact that Soviet scientists are " hungry for international co-operation," but it seems that much still remains to be done to intensify mutual relations with this country; in this connection, the improvement of postal facilities and the need for the exchange of students were stressed. Soviet science seems to be free from such fetters as Treasury consent for research activities, grants-in-aid, etc. When Professor Kapitza was erecting a new large-scale laboratory, he was asked by M. Molotov why he did not ask for yet more funds (*sic*). Our readers are now left to muse on what science in Britain could achieve, had it similar facilities at its disposal.

I.G. Under Control

THAT the plea made on previous occasions in these columns to eschew a policy of drift in dealing with Germany has been taken seriously, at least by the American authorities, is shown by the decision, recorded elsewhere in this issue, to place the I.G. Farben under military control and to remove the present management. That chemical giant has been allowed to become a malignant growth in the body of Europe, and with the rise of the Nazi party to its evil stranglehold over civilisation, the company developed, to all intents and purposes, into a tool of the régime. Its web of international cartel agreements and conventions has more than once been publicly stigmatised, both in the United States and in this country. The fate of the I.G. plants and laboratories (including, of course, its research units) presents a difficult problem. By no means all of them have been destroyed, or even damaged, by air attack: and, in view of the present paucity of goods in Europe, it appears inexpedient

to destroy the remaining factories out of hand. It must not be forgotten, however, that a chemical plant engaged in peaceful production can often, in a few hours, be converted into a deadly tool of annihilation. No transfer, conversion, or destruction of the I.G. Farben's plants will be of the slightest avail if the three major Allies relax their long-term control over Germany.

The Future of Germany

IT is our firm conviction that, during the next thirty years, Germany will assume, if she is permitted, the mask of a peace-loving nation, pursuing the most innocuous and co-operative of "good-neighbour" policies. But—and it is a very big "but"—unless we and our Allies can evolve an efficacious plan of re-education covering the next generation or two, the Germans will continue to nourish the idea of *Weltherrschaft*; and, as soon as their evil deeds are dim in human memory, as soon as the leaders who have won this war have died and the men they have led grown old, just so soon will the Germans embark again on the path of aggression. It is not yet too late for the victorious Allies to take steps to prevent this. As a footnote we might suggest that it is high time a similar decision to that of the U.S. authorities was taken in the British zone of occupation in Germany, where the Krupp works are the largest single unit. These questions, we hope, will soon engage the attention of the new House of Commons.

American Coal Research

HAVING paid a visit of several days to the Pittsburgh coal basin, reputedly the richest in the world, the New York Correspondent of the *Financial News* has returned with an impression of "unbelievable prosperity" there. He ascribes this mainly, of course, to the huge war-time requirements of coal, but also partly to Mr. John L. Lewis's annual demand for higher wages, so that the average pay of each worker (before deduction of taxes) is now about $65 per diem. It appears, further, that the miners are aware that this exceeding prosperity may not last, and are putting by savings for a rainy day; preliminary investigations by the U.S. Treasury indicate that the coalfields lead all other industries in the volume of war-bond purchases. Under such conditions, it is not to be wondered at that research is in full swing. The bituminous coal producers are working on various research projects to ensure that coal shall compete efficiently with diesel oil and petrol in the transport field. Special over-fire air-jets have been installed in 1000 locomotives, providing very nearly perfect combustion by utilising auxiliary air, thus increasing efficiency and eliminating smoke. A coal-propelled gas turbine locomotive is reported to be approaching a state of laboratory perfection. In addition, research scientists at the Carnegie Institute at Pittsburgh, and in other universities, are making an intensive study of the chemical uses of coal, to help provide a healthy and stable post-war market for the product of the mines.

Irish Items

New Research Plan

TO aid research work in Eire, new legislation is being planned and will be submitted to the Dail this year, said Mr. Sean Lemass, Minister for Industry and Commerce. Reviewing an estimate for the present Industrial Research Council, he told the Dail that the Government's view was that provision for industrial research should be re-examined. The country needed something more than a Research Council surrounded by the financial restrictions which were imposed on the present council. During the war a special Emergency Research Bureau was established with considerable financial freedom and scope of operation, but this was closed down a few months ago. It has frequently been urged upon the Government that research work should be extended, although there is a difference of opinion whether a Government-sponsored council, or university laboratories, should be the medium for the work.

Barytes Development Unlikely

Suggestions made in the Dail that steps should be taken to re-open and develop the barytes deposits at Ballydehob and Clonakilty, County Cork, are not likely to be acted upon. The Minister for Industry and Commerce stated in the House that further examination of the area is not likely to add materially to the information already available, and that the development of the deposits is primarily a matter for private enterprise, which would receive every possible assistance.

Chemical Notes from France

Unsatisfactory Company Results—Slow Industrial Recovery

MOST of the leading French chemical companies have now completed their accounts for the past year. The figures available so far show that their experience during the year of France's liberation has by no means been uniform. The Etablissements Kuhlmann closed last year neither with a profit nor with a loss. However, like most other chemical enterprises in France, they are in need of additional financial resources and therefore have issued 3½ per cent. debentures to the amount of 250,000,000 fr. at 94 per cent. Rhône-Poulenc made a net profit of 35,546,112 fr. in 1944 as compared with 65,933,605 fr., and have declared a dividend of 24 fr. (34 fr.). St. Gobain, on the other hand, reports a loss of 133,898,576 fr. for the financial year ended last December, while the Société Chimique de la Grande-Paroisse reports a fall in net profits from 36,926,269 fr. in 1943 to 1,294,168 fr. last year, which is carried forward. Mines et Produits Chimiques returned a loss of 13,585,185 fr. for the past year. Alais, Froges et Camargue (the well-known Péchiney company with its extensive light-metal interests) has not yet published its annual statement but has warned its shareholders that a loss would be shown and that no dividend payment was, therefore, to be expected. Mines de Potasse de Blodelsheim, a small Alsatian potash producer, recently published accounts for the years 1940-1943. The small profits made during this period are retained to cover depreciation.

Since it is not known how the various companies have treated the problem of depreciation and obsolescence and to what extent their financial statements have been influenced by the invitation, issued at the same time, to subscribe to new debenture issues, it is difficult to interpret the annual returns. However, it is fairly obvious that all French chemical companies, with the exception of Rhône-Poulenc, are pursuing a conservative financial policy, retaining such profits as they have been able to make, and adding to their financial resources by the issue of debentures.

Charcoal Products

Over the past five years France has been compelled, through lack of liquid fuel, to develop gas producers for her vehicles. This in turn has encouraged the production of charcoal and with it an intensification in the production of certain by-products. These are, in fact, of greater importance than the charcoal now, and a number of firms, particularly the Etablissements Dumesnil, have brought out transportable burners in stainless steel to aid in the separation of these by-products.

The most important by-product is tar which is given off at temperatures over 280° C. at the same time as various hydrocarbons including methane. As the temperature rises the tar becomes thicker. Between 500° and 700° other hydrocarbons are given off and the tar is less abundant and not so thick. Between 700° and 900° 80 per cent. hydrogen is given off and there is no tar. The best temperature for the tar is 400° when its quality is best and its quantity highest.

The separation of the various products is achieved by means of filters attached to the burners which separate the pyrolignite from the tar, the latter remaining at the bottom and the former retaining from 5 to 7 per cent. of the tar. The usual apparatus includes a dehydrator to remove water which not only interferes with the cracking of the tar but can cause serious accidents. The Dumesnil apparatus, however, includes a double burner in which the tar is stirred by convection and the dehydrator is thus dispensed with. Further experiments are now being undertaken and it is expected that an important industry will develop as soon as conditions permit.

Oils and Fats Position

Before the war France consumed 50,000 tons of tallow and 200,000 tons of vegetable oils. For 1945, French industry was informed that it would have to make do with a total of 22,000 tons, but it is now certain that imports will not reach that figure. National production is sluggish at about 150 tons a month, while oil from grape seeds averages 350 tons a month, against 600 in 1944. Glycerine production is affected by coal shortage, and linseed and fish oil stocks are zero. Some 14 tons of castor oil have been imported.

There is an important summer import programme to fill, and if the miners will only cut the coal there is a possibility that industrial fats and greases may be able to play an important part in French economic recovery, particularly in the chemical industries. In July-September some 6000 tons should be imported including palm oils from the French colonies. Add to this some 2000 tons of home-produced grape-seed oil, and an indeterminate quantity of tallow. In all, France will have about 13 per cent. of her pre-war consumption available which, though inadequate, is a tremendous improvement on the first quarter. The great need is for soap, both domestic and indus-

trial, the quantity being insufficient and the quality poor.

On the heavy chemical side there appears to be some improvement. Improved transport has permitted the shifting of great loads of pyrites from French mines for the making of sulphuric acid. Production, up to April, of sulphuric acid was over 36,000 tons, about 11 per cent. of the 1938 figure. Pyrites stocks have improved and now stand at about 100,000 tons. There has been a regular 50,000 tons of sulphuric acid distributed over three monthly periods, about 5 per cent. of pre-war consumption, a great improvement over last year.

Soda Products Shortage

There is a serious shortage in sodium carbonate and caustic soda which is holding industry up. Distribution, for the second quarter, to industry amounted to no more than 28,000 tons, whereas the demand is for at least 37,000 tons, even under present conditions. Home production of sodium carbonate in January-April, amounted to 17,200 tons, 11½ per cent. of the corresponding figure for 1938. Carbon disulphide produced was 1310 tons, or 40 per cent. of the output for the first four months of 1938. There is an industrial demand for about 90,000 tons of calcium carbide per quarter, but labour and other difficulties are keeping production down to 50,000 tons. The gap is to be made up with imports.

Directly after the liberation France was completely without sulphur and an import programme had to be drawn up immediately. The demand is for about 60,000 tons, 75 per cent. for agriculture and 25 per cent. for industry. By May, 53,650 tons had been imported, most of which was distributed among farmers. Industry, therefore, is suffering from an acute shortage as no more than 8700 tons have reached industrial firms. In these conditions, therefore, it cannot be stated that French industry is markedly on the upgrade, though there are distinct improvements. Certainly little important progress is to be expected before the end of the year.

Commenting on the recent visit to Moscow of Professor Szent-Györgi, the Hungarian scientist who discovered ascorbic acid. Professor Polanyi (in a letter to the *Manchester Guardian*) speaks with favour of the Soviet Government's invitation to Szent-Györgi to lecture. The Hungarian scientist had not spared criticism of Russia's action in invading Finland in 1940, but he was an even more bitter opponent of the Germans, and has now emerged from "underground" as a member of the National Assembly of liberated Hungary. The present Russian action is a tribute to a great scientist and a fighter for freedom.

Mica Splitting

Machines Designed in America

THE problem of a workable means of removing mica films, in thicknesses between one and three mils, from commercial mica blocks, has been studied by D. W. Kessler, of the U.S. National Bureau of Standards. This method is intended to be substituted for the usual hand-splitting. It requires three or four months to train a hand-splitter, and the average rate of splitting is between 15 and 20 films per minute.

Various chemicals were tried to determine whether the cementing material holding the sheets together could be dissolved. Several physical means, such as high voltage electricity, heat, sudden release of air pressure in the container, flexing, steaming, sudden changes of temperature, etc., were tried. Most of these methods gave no promise whatever, and those that showed some tendency to separate the films produced other effects that were undesirable. Efforts were then started to develop a machine that would remove films one by one.

Two mica-splitting devices have been constructed at the Bureau. The first consists of a single suction chuckplate which holds the mica blocks while it slides back and forth on a track. The gauge which starts the split is stationary except for a slight rotation in a vertical plane. When a film is started and bent upwards, it is caught by two claws actuated by suction, and pressed on a small drum. As the drum rolls back, the film is stripped and carried to a suction belt which deposits it in a tray at some distance from the machine. This device produces about 30 films per minute, the slow rate being caused mainly by the fact that the operation has to be stopped while new blocks are being placed on the chuck. The method of stripping is also believed to be too severe since the bending of films caused more scales and defective sheets than does hand-splitting.

A Practical Device

The second device consists of a disc carrying six chuckplates, a starter gauge similar to the first, two stripper blades, and a suction belt for removing the films from the machine. With this device little time is lost in changing blocks, since one chuck is loaded by the operator while another block is being split. When the first block is finished, the operator turns the disc until the chuck comes into position, requiring only about one second for the change. With this device there is very little bending of the films, and the results are more satisfactory.

Cutting with Propane

A Hydrocarbon's Rôle in Heavy Engineering

SINCE the use of propane was advocated in an article which appeared in the April, 1944, issue of the *Production and Engineering Bulletin*, the English Steel Corporation has gained valuable experience in this practice. A report prepared by that concern and published in the May, 1945, issue of the above *Bulletin*, should, we submit, be of interest to our readers.

During the last few years, the English Steel Corporation has carried out experiments in the development of cutting gases for use as alternatives to dissolved acetylene.

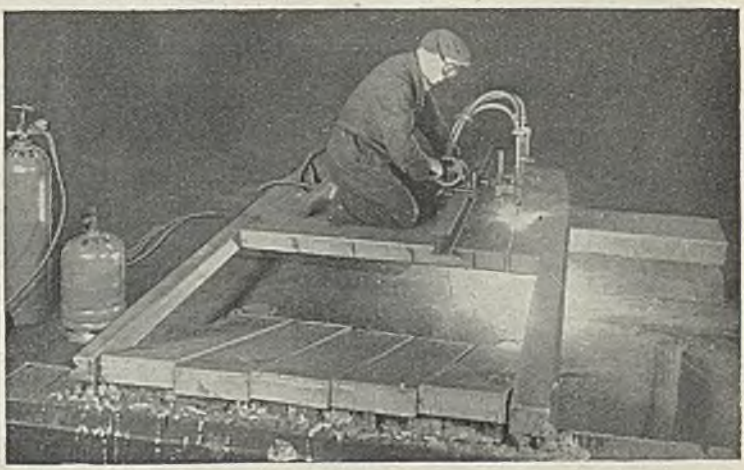

Fig. 1. A straight-line metal-cutting machine being used on 5-inch slabs of nickel-chrome-molybdenum steel. Both the cylinders shown contain propane.

As the result of practical trials with various gases they have concluded that propane is the most suitable for general application, and its use for cutting purposes has been extended into many departments.

Propane is supplied as a liquid in cylinders, under pressure. It is thus in a more concentrated form than dissolved acetylene, and one cylinder of propane will do as much cutting as several cylinders of the same size containing dissolved acetylene. This saves labour in handling and transport, and is of considerable practical benefit in maintenance work where cylinders must be carried about from job to job.

Another important point is that the calorific value of propane is higher than that of acetylene, and the proportion of gas to oxygen required for proper combustion is different for the two gases. To obtain the best results from propane, it is necessary to have burners designed for use with that gas. Cutters designed for use with acetylene will not give good results if used with propane without alteration.

The cost of propane for equivalent heating value is less than that of dissolved acetylene. Propane will cut any carbon steel and most qualities of steel and iron up to thicknesses varying with the chemical analysis of the material, and it also gives good results where it is applied in deseaming.

Compared with dissolved acetylene, the pre-heating time with propane is slightly longer, but the time of cutting, and the oxygen consumed during cutting, is practically the same in both cases, since when once a cut is started it is primarily the oxygen which does the cutting. In small jobs the difference in pre-heating time between propane and dissolved acetylene is insignificant.

The purposes for which propane has been successfully used include the cutting of scrap. The company used propane for cutting plates up to 6 in. thick, this cutting being done largely in the open air. This was considered the practical limit for nickel-chrome-molybdenum and similar alloy steels. They have recently obtained some new equipment with which they have successfully cut plates 9 in., 10 in. and 12 in. thick in nickel-chrome-molybdenum and other armour qualities. At the moment, they are experimenting with propane in the cutting of cast iron up to 8 in. thick. In rolling mills, bars and billets in all qualities of ordinary and alloy steels are also being cut with propane.

In sheet mills, using straight-line cutting machines on chrome-molybdenum and nickel-chrome-molybdenum steel slabs of 16¼ by 5 in. section, it is claimed that the cut is cleaner than with dissolved acetylene

(Fig. 1). Turning to armour departments, the company reports that results on heavy cutting and heavy deseaming are perfectly satisfactory. It was thought at first that propane was slower than dissolved acetylene, but tests over a period have shown that there is practically no difference.

In boiler shops, propane is used exclusively, except for welding purposes. Plates, channels, angles and sections up to 5 in. thick are regularly cut without difficulty. The cuts are repored to be very clean, and it is claimed that the nozzles have a longer life than with acetylene.

Dissolved acetylene has been entirely replaced by propane for light foundry use. Very good results have been obtained in removing the flash from castings and cutting feeder heads up to 15 in. in diameter. In the works generally, dissolved acetylene was originally used exclusively, whereas it has been reduced to 6 per cent., propane being used for the balance.

In two of the concern's heavy foundries, acetylene from low-pressure carbide generators is used. At present, supplies of carbide are satisfactory, so that they have not proceeded with the application of propane. Trials, however, have been carried out so that if the carbide situation deteriorated they would be able, at short notice, to use propane. Lastly, thin plates of armour quality, of the order of 16 mm. thick, have a thin film of very tenacious scale, and only acetylene will machine cut them at a satisfactory rate. Similar plates, after descaling, are however readily cut with propane equipment.

Society of Chemical Industry

Points from the Annual Report

WHILE we are going to press, the Society of Chemical Industry will be holding its 65th annual meeting, the first since the victorious conclusion of the war with Germany, and although the full glory of pre-war ceremony cannot yet be reinstated, it is not likely that the proceedings will have to be adjourned, as they were last year, owing to enemy action.

The annual report for the year that has passed contains news of transatlantic activity. In Canada, in conjunction with the Chemical Society, an examination has been made of a three-body membership scheme with the Chemical Institute of Canada. In the United States developments likewise appear to be on foot stimulated by the personality of the previous year's president, Dr. Wallace Cohoe, and by the visit of the hon. foreign secretary, Mr. Stanley Robson.

On the Council, Professor E. K. Rideal has happily consented to be nominated for a further year of service as president. Dr. Ellingham resigned his office of joint hon. secretary at the end of 1944, after carrying out much valuable work, and has been succeeded by Dr. E. B. Anderson.

Increased Membership

Membership of the Society continued to increase during the year under review, and a new high level of 5981 was reached on January 1, 1945, an increase of 861. Provision has been made for a grade of student membership at a reduced subscription. The financial position, under the able stewardship of Dr. Lampitt, likewise continues to improve. A contribution of £1000 to the Society's funds was made by the Chemical Council. A further £3500 has been placed to post-war publishing reserve; £2000 goes to a special purposes fund, with a view to making certain provisions for pension payments; and £500 has been allocated to the hospitality fund.

Awards during the year were as follows: Harrison Memorial Prize, Dr. L. F. Wiggins; *Liverpool Section*: S.C.I. Prizes, W. V. Mitchell (senior), E. Bowes (junior), B. C. Moses (special merit); Leverhulme Memorial Prize, K. Clarke; *Newcastle Section*: Saville Shaw Medal, J. S. Thompson; *American Section*: Perkin Medal, Dr. E. K. Bolton; Chemical Industry Medal, Col. Bradley Dewey. The John Gray Scholarship was not awarded.

The Jubilee Memorial Lectures were delivered by Dr. L. A. Jordan, on "Paint—the Art and the Science," and by Dr. D. T. A. Townend, on "The Present Era in Combustion."

Chemical Council

In March, 1944, a new appeal was issued by the Chemical Council for further funds, the appeal being circulated not only to those who had previously subscribed, but also to many others. In this appeal, the Council rightly stressed the importance of publication, and gave it as a considered opinion that at least £10,000 per annum is needed from industry to enable the societies that are members of the Chemical Council to raise their publications to the required standard of efficiency. The Society endorses this and, while appreciating the fact that £1000 was again contributed by the Chemical Council to its funds, considers that its work for industry is such as to warrant a much larger sum as a direct contribution through the Chemical Council. It is gratifying to

the Society to learn that as a result of the appeal considerably larger sums will be available in the future.

The Bureau of Chemical and Physiological Abstracts has issued its last report under that name: in future it will be known as The Bureau of Abstracts. It has had to answer several important criticisms of its publications. Some of these criticisms arose from the inevitable difficulties of war-time; others are more fundamental, including: (a) That British Abstracts are redundant—only one set of abstracts in the English language should be published; (b) That the "spread" of abstracts published by the Bureau is not sufficiently wide; (c) That the present use of abbreviations should be reduced materially; and (d) That the Index is in need of improvement.

Criticism of Abstracts

The first criticism cannot be ignored. The preparation and publication of only one set of chemical abstracts in the English language instead of two should lead to economy of effort and possibly to all-round economy. It must be pointed out that attempts have been made in the past to co-operate with the American Chemical Society in the production of abstracts, the last as recently as during the past year, but there are difficulties. It is not at all certain that the majority of British chemists would prefer the American method of publication to our own, and although it might be possible to arrange to leave the publication of chemical abstracts entirely to the American Chemical Society, this is a step which the Bureau does not at present contemplate. Measures of co-operation will, however, continue to be explored.

There is one other very important consideration. The Abstracts published by the American Chemical Society are not the only ones issued in the States; those of the Bureau are not the only ones issued in Great Britain. It would appear obvious that integration on a national scale both in America and Great Britain would make international agreement more possible. In this connection it is of importance to record that during the year a joint committee of the Bureau and of Science Abstracts has been set up to explore possible co-operation, and as a result some valuable mutual help has been given and received. It is evident that in spite of criticisms the publications of the Bureau are necessary, otherwise there would not be the continual increase in outside subscriptions.

As regards the second criticism, the Bureau is handicapped by the difficulty of obtaining the original journals, for whereas before the war some 1000 were abstracted, to-day the total number is only 530. It is the intention of the Bureau to improve on the 1938 standard, but there is a point which is often forgotten, namely, that as the scope of Abstracts increases so the appeal to more groups of specialists increases, and it will be the policy of the Bureau to try to satisfy this continually expanding demand. It is, however, obvious that there will be much leeway to recover when more journals issued during war-time become available.

New Indexing System

It is intended to revert to the publication of one joint index when paper supply permits. A special committee is now sitting to discuss the whole question of indexing, including the possibility of publication of a formula index and of other specialised indexes. It is admitted that the Abstracts suffer by reason of excessive use of abbreviations and contractions introduced to save space. A committee is to report shortly on this matter.

Salvaged Tin

An Important War-Time Effort

IT is well known that salvaged paper, bones and food have formed important additions to war-time economy, but the value of the household tin can as salvage material during the war period has not generally been appreciated. In this connection it is interesting to refer to the activities of the New London Electron Works, Ltd., of East Ham, who operate an electrolytic plant for the recovery of tin from used cans.

During the war, that company has treated over 106,000 tons of salvaged cans, thus returning to industry 100,000 tons of steel and 750 tons of tin. The importance of this effort can be appreciated when it is realised that owing to the coating of tin, the can as such cannot be used in the manufacture of steel. By removing the tin, not only is a valuable addition made to the quantity of steel scrap available, to maintain the enormous flow of steel for armaments, but with the conquest of Malaya by the Japanese and the resultant loss to the war effort of the Malayan tin output, the recovered tin has assumed equal importance.

The bulk of the raw material for the detinning works originated in the dustbins of London and its environs, although an appreciable quantity emanated from the Army Salvage Depots in Southern and Eastern England.

Situated in a vulnerable area, the works have been the scene of several incidents, but by improvisation the loss of production was reduced to negligible proportions. The treatment of used household cans should continue to form a valuable addition to the economy of the country in times of peace

New Control Orders

Chrome Order Revoked

THE Minister of Supply has made the Control of Chrome, Magnesite and Wolfram (No. 4) (Revocation) Order, 1945 (S. R. & O. 1945, No. 792), revoking the Control of Chrome, Magnesite and Wolfram Orders (No. 1) of 1940, (No. 2) of 1941, and (No. 3) of 1942, by which the disposal and acquisition of chromium, chromium compounds, magnesite, wolfram and certain basic or neutral refractory materials were made subject to licence. The new Order removes all existing restrictions on sales and purchases of these materials in the United Kingdom. Imports, however, remain subject to the import licence procedure. Inquiries regarding wolfram should be addressed to the Adviser on Wolfram, Iron and Steel Control, Steel House, Tothill Street, S.W.1, and as regards the other materials to the Chrome Ore, etc., Control, Broadway Court, Westminster, S.W.1.

Exemptions from K.I.D.

The Treasury has made an Order (S. R. & O. 1945, No. 692) exempting the following articles (among others) from Key Industry Duty from July 1 to December 31, 1945:

Fermentographs; arc-lamp carbons; sealed cylindrical X-ray tubes with four windows.

Oxides of the rare earth metals; and the following fine chemicals, etc.: acetamidosalol, acid adipinic, acid dipropyl-malonic, acid filicic, acid maleic, acid oxalic, acid phthalic anhydride, acid propionic, acid quinolinic, acid succinic (not including acid *iso*succinic), acid isobutyl allyl barbituric, acid *iso*propyl barbituric, cyclohexenyl ethyl malonyl urea, *iso*-amyl ethyl barbituric acid, *N*-methyl ethyl phenyl malonyl urea, sodium ethyl methyl butyl barbiturate, sodium *iso*-amyl ethyl barbiturate, sodium propyl-methyl-carbinyl allyl barbiturate, alcohol amido-ethyl, alcohol dodecyl, alcohol furfuryl, alcohol propylene, allyl paracetaminophenol, aluminium chloride (anhydrous), amidoguanidine sulphate, amidopyrin, amidopyrin-barbitone, *o*-anisidine, benzoyl chloride, betain hydrochlorate, butyl methyl adipate, caesium bromide, ethyl cellulose, *o*-chlor-nitrobenzol, *p*-chlor-nitrobenzol, cocaine (crude), pseudo-cumenol, methyl cyclohexanol methyl adipate, dicyandiamide, didial, *p*-di-ethoxy ethenyl diphenylamidine and its hydrochloride, diethyl amino-ethanol.

Diethylamine, dimethylamine, diphenyl, diphenyl oxide, cinnamoyl para-oxyphenyl-urea, emetine, emetine bismuth iodide, emetine hydrobromate, emetine hydrochlorate, ethyl abietate, ethyl benzoyl-benzoate, ethylene bromide, eukodal, furfurol, germanium oxide, diglyceryl tetra-acetate, glycol ethers, kryofin, lead tetra-ethyl, lipoiodin, lithium fluoride crystals, not optically worked, weighing not less than 2.5 grams each, maleic anhydride, R. Mannitol, methyl ethyl glycollate, *N*-(oxy-aceto-mercuric-propyl)-ethylurethane, methyl amidoxybenzoate, methyl anthranilate, methyl abietate, oxymethyl para-oxyphenyl benzylamine methyl sulphate, methyl-sulphonal, methylene chloride, α-naphthyl isothiocyanate, nickel hydroxide, nitro-guanidine, sodium dioctyl sulpho-succinate, copper methyl-arsenate, 4-oxy-3-ethylamino-phenyl arsinic acid, *N*-methyl tetra-hydro pyridine β-carboxylic acid methyl ester, *m*-oxy-acetophenone, *o*-phenetidine, phenetidyl-phenacetin and its hydrochloride, deca-methylene diguanidine dihydrochloride, dodecamethyl diguanidine hydrochloride, phloroglucine.

Phthalic anhydride, phytin, piperazine, potassium bromide or chloride crystals, not optically worked, weighing not less than 2.5 grains each, potassium ethyl xanthogenate, potassium guaiacol sulphonate, R. potassium hydroxide, quinine ethyl-carbonate, safrol, sodium phenyl dimethyl pyrazolone amino-methane sulphonate, sulphonal, theophylline, trichlorethylene, trimethyl-amine, valeryl diethylamide, veratrine, *m*-xylol, vanadium-silica catalysts.

Sulphur

The Control of Sulphur (No. 4) (Revocation) Order (S. R. & O. 1945, No. 816) revokes the Control of Sulphur (No. 3) Order 1942, which prohibited the use of sulphur in the process known as "stoving" in the wool textile and wool hosiery industries. The new Order came into force on July 11.

CONTROLLING AND RECORDING CONFERENCE

The Institution of Chemical Engineers, the Institute of Physics, and the Chemical Engineering Group of the Society of Chemical Industry announce that the one-day joint conference on "Instruments for the Automatic Controlling and Recording of Chemical and Other Processes," which was postponed last September, will take place in the Royal Institution, London (by kind permission of the managers), on October 19. The purpose of the conference is to promote the interchange of knowledge and experience between those using automatic controllers and recorders in different fields and to encourage collaboration between physicists and chemical engineers. It will be open without charge to all interested, whether members of the organising bodies or not. Further particulars will be sent in September to those sending a request for them to the Organising Secretary, Joint Conference, c/o the Institution of Chemical Engineers, 56 Victoria Street, London, S.W.1.

Scientists in the U.S.S.R.

Achievements in Adversity

TO understand the circumstances and atmosphere of the recent visit of British scientists to Russia, it is necessary to appreciate the position of the Academy of Science in the U.S.S.R., which is very different from the position of our Royal Society. The Academy, which is a State institution, receiving support on a large scale, is generally responsible for the promotion of research in both pure and applied science and so covers functions which are in this country carried out by the universities, by Government institutions, such as the National Physical Laboratory, the Medical Research Council, the Agricultural Research Council, and the D.S.I.R., by the Royal Society and other scientific societies, and by industrial laboratories and so on. There are in Russia laboratories and research institutes which are not run by the Academy, but they seem to be relatively unimportant.

Pure and Applied Science

Many of the laboratories inspected were outstanding in equipment and organisation. It is the general policy to carry on work on pure science and on the applications of science in the same institute. This seems to work quite well. The endeavour to show that everything that is going on may have a practical application is natural in a country that has so much destruction to make good. A keen appreciation of what British scientists have done was visible everywhere, but also that both nations had something to learn of each other's methods.

The system does not seem to be rigid and modifications are continually taking place. When Professor Joffé, the physicist, first took up his position as more or less general director of Russian physics, he had some 2000 people, including 700 scientific workers, collected together under him at Leningrad. This number proved too large, and in 1928 decentralisation began. In his own particular institute there are now only 200 people, including 70 scientific workers, which he thinks is about the right number for efficient original research work. The huge optical institute in which every kind of optical work, including glass-making, is going on, has, however, some thousands of workers.

Professor Kapitza, who first made his name in the scientific work at Cambridge, occupies a prominent position in Russian science. In his institute work on liquid helium, on the large-scale liquefaction of air, and on the preparation of liquid oxygen, which is of great industrial importance, are proceeding at the same time. Helium production totals at present 45 litres per hour, while there is such a large surplus of oxygen —which is being produced by a novel method—that new industrial uses are constantly being looked for. The use of oxygen instead of air in metallurgical processes is one of these, and Russian scientists are within practical distance of making aluminium from clay on an industrial scale, a development which would bring the price of the metal down to that of iron.

Organic and Physical Chemistry

In the field of organic chemistry, Sir Robert Robinson pointed out, great progress has been made in the fundamental chemistry of petroleum and of acetylene, leading to the development of an acetylene industry.

In a statement prepared by Professor F. G. Donnan, reference is made to the work of the Physical Chemistry Institute of Academician Frumkin in Moscow, and also to the Karpov Institute and to Professor Semenov's new Institute for Chemical Kinetics at Moscow. In Leningrad he was very interested in the famous researches carried out at the Physico-Technical Institute by Academician Joffé. Professor Donnan had the pleasure of presenting the messages of greeting to the Academy sent by the President and Council of the Chemical Society, and the Faraday Society. "I, for one," Professor Donnan concludes, "would wish to speak in the highest terms not only of the great scientific organisation for research and development of the Academy's institutes, but also of the great buildings and magnificent squares which we saw at Moscow and Leningrad. Only a very long and detailed report could do the merest justice to all the splendid things we saw during our wonderful visit.

On the various excursions which were offered to the party, they saw the tragic results of German savagery and vandalism. It is well known, however, that reconstruction work began immediately the Soviet lands were cleansed of the enemy, and has been speeded up since VE Day. It is indeed remarkable how Russian scientific work has been maintained at a high level, considering the disorganisation resulting from the enforced evacuation from Moscow and Leningrad during the war.

The visit was, in short, an outstanding success. The names of the British visitors were in general already well known to their Russian colleagues; they made front-page news and formed personal friendships. It is hoped to arrange a visit of Russian Academicians to this country and to entertain them worthily in return.

Indian Chemical Industry

Food Yeast—Penicillin—Research Schemes

THAT food yeast can be manufactured in India cheaply and on a large scale, that its use as corrective for malnutrition should be developed by the Food Department and that a factory with a capacity of 3000 tons per annum should be started immediately, are some of the recommendations made in a recent report by the Special Officer of the Food Department.

The Department has long been interested in finding a cheap source of a highly nutritive foodstuff for the poorer sections of the people, and in securing a new and profitable utilisation for surplus molasses, which is cheaply available in India. Competent observers were of the opinion that the manufacture of food yeast was a practical proposition in India, and a committee, with Sir S. S. Bhatnagar as chairman, pursued the question, and Mr. Nanak Chand, the Special Officer, was asked to report on the best methods for the disposal of effluent from the factory and for the utilisation of the manufactured product.

The principal deficiency of Indian diets is lack of high-grade proteins and vitamins of the B complex, both of which are found in food yeast. One of the problems is to make food yeast available to the rice-eating population which, generally speaking, is poorer and therefore less adequately nourished than those whose staple diet is wheat. While it is conceded that there is no means of mixing food yeast with rice at any stage in milling or in cooking, other methods are suggested, such as cooking with curry or vegetables, mixing with spices, and taking with milk or in sweets. In the case of wheat-eaters the problem is simpler. Food yeast can be given very easily by mixing with flour and *atta*. This will provide additional vitamins and proteins some of which are lost in wheat milling.

A committee is to be appointed to advise the Government of India on the manufacture of penicillin. This decision was made at the 8th meeting of the Governing Body of the Council of Scientific and Industrial Research held in New Delhi on March 17.

New Research Work

The Governing Body also approved recommendations in regard to the continuation of 71 research schemes (costing about Rs. 6½ lakhs) under the auspices of the Council. In addition, certain new schemes of research, estimated to cost Rs. 1¼ lakhs, were sanctioned, including investigations into the chemistry of penicillin and related anti-bacterial substances, the manufacture of disinfectants from lemon grass oil, utilisation of waste products from the shark, the manufacture of Seger cones, and the investigations of proteins and proteases with reference to their industrial application.

A firm of architects was selected for the building of the National Metallurgical Laboratory at Jamshedpur and it was also decided to locate the National Physical Laboratory in Delhi. The budget estimates of the Council of Scientific and Industrial Research for the year 1945-46, amounting to Rs. 19 lakhs, were approved, as were the reports of the various research committees, and a sum of Rs. 88,000 sanctioned.

Penicillin Control Order

To prevent the manufacture and marketing of spurious products under the guise of penicillin and to ensure that penicillin placed on the market conforms to the recognised standards, the Central Government has issued the Penicillin Control Order, 1945. Penicillin may not be manufactured for sale except under a licence and must be tested before being issued for sale.

I.G. Farben Seized

U.S. Military Control

THE United States Military Government has seized the vast German chemical and dyestuffs concern, Interessen Gemeinschaft Farbenindustrie A.G. in the American zone of occupation. Management and assets owned or controlled by I. G. Farben are placed under military control pending ultimate dispositions to be made by the Four-Power Allied Control authority. The present management will be removed, and the plants will be run under the control of Colonel Edwin S. Pillsbury, says Reuter.

Colonel Pillsbury was born in San Francisco in 1896. He is a graduate of the Law Schools of the University of California, and of Harvard. He served in 1917-19 as First Lieutenant with the U.S. expeditionary forces in France and has, for the past six weeks, been attached to the economic division of the U.S. Group Control Council in Germany.

In accordance with the policy of eliminating Germany's war potential, the I. G. Farben will have to make available to the United Nations any property or products required for the fulfilment of relief, restitution, or reparation programmes. The company will have to carry out the destruction of all property for the production of implements of war (except those required by the United Nations), as well as the dispersal and control of plants and equipment not transferred to destroyed.

The Noble Metals in War Time

Johnson, Matthey's Record

AT the annual general meeting of Johnson, Matthey & Co., Ltd., the chairman, Mr. H. W. P. Matthey, revealed some extremely interesting details concerning the company's war effort. For example, during the war, some 15,000 pieces of platinum laboratory apparatus, including crucibles and electrodes, have been made by the company. In addition, platinum plant and apparatus have been specially constructed for the making of glass, chemicals, and explosives. Considerable quantities of platinum and rhodium-platinum gauzes have been supplied for use as catalysts in the oxidation of ammonia, an essential preliminary in the manufacture of both sulphuric and nitric acids. The firm's rhodium plating process has been used in the protection of millions of components of electrical and radio apparatus against attack by salt spray or atmospheric corrosion.

Silver at War

Silver has played a very important part in the saving of life at sea. It is used for rendering sea-water fit for human consumption, and many tons of the necessary silver salts have been prepared. Silver gauze catalysts for the production of formaldehyde, and silver or silver-plated plant for the preparation of penicillin, are other important uses in the manufacture of fine chemical and medicinal products.

The company's radium laboratories have prepared radium salts and filled these in platinum needles, highly specialised work which requires the most careful and accurate control.

The use of platinum/rhodium-platinum thermocouples for the measurement of high temperatures has been extended during the war years to temperatures of over 1600° C. encountered in steel-making, thus giving increased control and economy in this basic industry.

Silver deposited on to mica for electrical condensers has received attention. The company prepared several tons of "liquid silver" for this purpose, and having invented both a new silver paste and a new method of depositing it, produced several millions of silvered mica condenser plates which give a highly satisfactory performance. A material and a method have also been developed for the depositing of silver whereby it can be fused on to electrical porcelain or glass, thus providing a metallised surface to which another metal can be soldered.

In conjunction with an associate company, a range of copper alloys containing beryllium and other metals has been developed. The chief features of these are their high electrical conductivities, coupled with greatly improved mechanical strength. Beryllium copper has been rapidly adopted during the war for contact springs in switch gear, instruments and radio equipment, for pressure-gauge tubing and similar applications. Other alloys of this type are extensively used as resistance welding electrodes, and as castings for structural parts of switchgear, arc furnaces and other electrical equipment.

Elkonites

Another range of electrical contact materials, also produced by this associate company, consists of silver or copper with with either tungsten or molybdenum. These are employed in heavy duty switchgear where great hardness and resistance to electrical erosion are required, but where high electrical conductivity is essential.

Several million ounces of silver nitrate have been prepared for photographic emulsions, while a more recent discovery of an optical nature is a method whereby an extremely thin film of gold is fired on to the surface of glass, producing a transparent filter for use in goggles which reflects the infra-red or heat-generating rays. The effect is that when used as goggles they provide a soothing relief from glare and prevent the tiring and harmful effects of heat upon the eye.

Precision Base Metal Production

"In equipping ourselves," the chairman went on to say, "with the necessary plant and tools essential for the working of the noble and platinum metals, accuracy in working to fine limits is one of the dominant factors. Our staff and operators are trained to work to precise limits on plant specially designed for our needs. This equipment, while on a scale greater than is used in the laboratory, is smaller than that required for large-scale production in the base metal industries. There are, however, a number of applications for certain base metals in the form of very fine wire, strip or tube, produced to exceedingly close limits, and it is here that we are able to provide a service that would be an embarrassment to the large-scale manufacturer. We make some base metal alloys, such as phosphor bronze, but purchase others, such as nickel alloys and stainless steel, at the finest sizes prepared by the bulk producer, and then carry on with the processing on our precision equipment.

"We have produced millions of miles of fine wire, some drawn to a tenth of a hair's breadth, for electrical resistances (large

quantities of this material have been woven into airmen's suits to provide electrically-heated jackets), for electrical fuses, instrument springs and suspensions. We have also drawn thousands of miles of very fine seamless tubing for use in radio valves and as capillary tubing for instruments, and we have cut, to precision lengths, some two hundred million pieces for various purposes. We have also a range of fine automatic lathes, and have made some three hundred and fifty million instrument screws and other precision turned parts, in copper, brass, and other non-ferrous metals.

"The vitrifiable enamels which we prepared before the war for the decoration of pottery and glass have been applied to war needs as a result of our inventing a new type of paper transfer upon which the enamels are printed. They enable a clearly defined, durable mark to be fused on to glass in one or a multiplicity of colours."

The graduation of over six million hypodermic syringes, the marking of thirteen million glass fuse containers, and the production of many instrument dials and other components requiring various markings were also undertaken during the war.

Assaying the Vitamin-B Complex

Microbiological Methods Described

IN a lecture delivered on May 16 to the London and South-Eastern Counties section of the Royal Institute of Chemistry, Dr. E. C. Barton-Wright dealt with the Microbiological Assay of the Vitamin-B Complex, Selected Amino Acids and Potassium. He pointed out that the vitamin-B complex was composed of the following substances: vitamin B1 (aneurine), vitamin B2 (riboflavine), nicotinic acid or nicotinamide, vitamin B6 (pyridoxine), pyridoxal, pyridoxamine, pantothenic acid, biotin, inositol, and *p* aminobenzoic acid. The constitutions of all these substances were known and had been confirmed by synthesis. There were, however, a number of bodies which had been provisionally assigned to the vitamin-B complex, such as folic acid, vitamin Bc, vitamin B10, and vitamin B11, of which the constitutions had yet to be determined.

Under a recent labelling order of the Ministry of Food (S. R. & O. 1944, No. 738), food manufacturers must now disclose the amounts of aneurine, riboflavine and nicotinic acid in their products. With the exception of aneurine, the remaining members of the vitamin-B complex are difficult to estimate by chemical means, and biological methods are tedious and expensive. Microbiological methods of assay have been used for riboflavin and nicotinic acid in recent years, and these methods have been extended to other members of the vitamin-B complex, as well as to the determination of certain amino acids. These microbiological methods are relatively expeditious and inexpensive and give reliable results if experimental conditions are kept rigidly constant.

The chief organisms used for the assay of the vitamin-B complex are to be found among the lactic bacteria. Thus *Lactobacillus helveticus* can be used for the assay of riboflavin and *L. arabinosus* for the assay of nicotinic acid. By suitable readjustments of the medium, *L. arabinosus* can also be used for the assay of pantothenic acid and biotin. Aneurine can also be estimated microbiologically by means of the soil organism *L. fermentum* 36, a method which is particularly valuable in cases where the chemical method of estimation (thiochrome method) does not give reliable results, *e.g.*, with rye.

The only vitamin of the B-complex which cannot be estimated by means of the lactic bacteria is vitamin B6 (pyridoxine). The reason is that these organisms respond to a far greater degree to the two newly-discovered vitamins pyridoxal and pyridoxamine which, chemically speaking, are very closely related to pyridoxine. For the microbiological assay of pyridoxine, it is necessary to use a special X-ray mutant of the fungus *Neurospora sitophila* No. 299.

Not only can the lactic bacteria be used for the quantitative determination of the vitamins of the B-complex, but they can also be used for the estimation of a number of amino acids, including all the so-called "essential" amino acids; but the various methods for the estimation of the amino acids by chemical means are, without exception, manipulatively difficult and tedious, and require skill and long practice. Microbiological methods, on the other hand, can give results within three days with a high degree of accuracy.

Two organisms among the lactic bacteria can be used for the quantitative determination of potassium: *Lactobacillus helveticus* and *Streptococcus fæcalis* R. In actual practice it is better to use *Str. fæcalis*, because this organism is unique among the lactic bacteria inasmuch as it requires only one mineral element, potassium, in the medium for normal growth.

Although microbiological assay methods need patience and care in manipulation, provided the instructions are carefully followed, they yield reliable and reproducible results. Moreover, they have the great merit that no special or expensive apparatus is required and that a number of samples can be dealt with at any one time.

Denmark's Chemical Resources

The Need for Imports

DENMARK, occupied by Germany in Spring, 1940, was one of the last countries to be liberated. Fortunately, however, the economic system, and agriculture in particular, was left intact and it may be assumed that the country will be spared some of those difficulties which have arisen in other liberated countries in Europe. The chief reason for this is that Germany regarded Denmark as an almost inexhaustible larder, and any serious disruption of the economic balance would have disturbed the flow of foodstuffs to Germany.

Denmark possesses no mineral raw materials, of the status of coal or oil. There are some coal mines on the island of Bornholm, but the coal is of poor quality, has a low thermal efficiency, and is unsuitable for transport on account of its tendency to absorb moisture. The mines have proved a failure and the coal is now used for fuel only by the islanders themselves. Far more important is the Bornholm deposit of high-quality kaolin, the basic material for the world-famous Danish porcelain manufacture in Copenhagen, and for the production of technical porcelain for a variety of purposes, considerable quantities of which were shipped abroad.

However, in spite of this lack of indigenous raw materials, nearly a third of Denmark's population is employed in industry. The ports have become the seat of most of the industrial plants, but only in a few cases has native raw material played an important part, a notable example being the great cement works which found their raw materials near the coast. Thus the two main centres of cement production are situated round Aalborg and Mariager in Jutland, where there are large factories with their own harbour and loading facilities.

Vegetable Oils

The vegetable-oil industry of Denmark is of great importance, and has at times accounted for one-third of the country's industrial exports. Of the large mills, the Aarhus Oliefabrik, and the Dansk Sojakagefabrik obtain their raw materials from plantations in the Tropics. Their oils go to the margarine works, while agriculture absorbs the rest of the output for cattle fodder, etc. This leads up to the field of industry in which Denmark's activity has been most prolific. In connection with agriculture and the world-wide supply of foodstuffs, a development that is unique in world industry has come into being; industrial establishments are working in fruitful co-operation with agriculture to the ultimate benefit of the Danish people.

An important Danish industry is the manufacture of fertilisers, particularly of superphosphate, which averaged about 200,000 tons yearly. The raw material was imported either in the form of phosphates from Morocco, or in the form of pyrites from Norway and Spain. However, domestic production did not cover the large requirements resulting from Danish application of intensive methods of farming. Denmark had, therefore, to rely on imports, details of which are given in Table I.

TABLE I

Denmark's Fertiliser Imports in 1937 (100 *kg.*)

Origin	Phosphates	Super-phosphates	Calcium Nitrate and "Norgesalpeter"
Germany	—	110,834	28,343
Gt. Britain	—	25	—
Norway ...	—	—	897,723
Holland ...	229,345	86,200	96,925
French N. Africa ...	1,762,773	—	—
Total* ...	2,021,047	197,059	1,022,991

(*From all countries).

Another important branch of Danish industry having its roots in agriculture is the manufacture of pharmaceutical products. In addition to those of purely synthetic origin, a number of organotherapeutic preparations are being made, raw materials for which come from the Danish model slaughter-houses. Before the war, insulin and liver products, which enjoyed a good market in foreign countries, were foremost among these commodities. There can be little doubt that, in view of the world-wide shortage of pharmaceuticals, Denmark should soon regain her former position.

Greenland's Cryolite

In Greenland, Denmark's only overseas possession, there are important cryolite deposits. The mine at Ivigtut is owned by the Danish State, and the mining concession belongs to A/S Kryolith Mine og Handels Selskabet, Copenhagen. This concern distributes all the raw material between a concern in Philadelphia, which has the monopoly for U.S.A., and a Danish firm, *viz.*, Œresunds Chemiske Fabriken Kommanditselskab ved C. F. Jarl, Copenhagen, which has a monopoly for the rest of the world. The mine at Ivigtut has an output of up to 36,000 tons per annum, and, according to the latest estimates, there is enough cryolite left to enable the mine to be worked for an indefinite period. The raw material contains about 10 per cent. of impurities, most of which are removed on the spot by refining processes; only minute traces of lead, copper, and zinc remain, while the iron content is reduced to 0.04 per cent. Originally, cryolite was used in soda manufacture but it is now principally employed in aluminium plant, in glass and

enamel works and in the ceramic industry. It has been reported, from time to time, that oil had been found in Greenland but, so far, nothing like a commercial production has been developed. Yet it cannot be denied that the methods developed in recent years to overcome, in part, the rigours of the arctic climate, might, together with an intensive exploration programme, lead to more satisfactory results.

Danish Chemists' Work

Although Denmark has hardly a noteworthy heavy or organic chemical industry, her contribution to chemical research and science has always been great. H. C. Œrsted (1777-1851) did important work, notably in the production of aluminium, but he is particularly known for his work on the electromagnetic field. Julius Thomsen (1826-1908) may justly be called the founder of thermo-chemistry, for as early as 1851 he evolved the principle that in the generation of heat in a chemical process lay the true measurement of the chemical force, a principle which later on, had a powerful advocate in the person of Berthelot, with whom he shared the Davy Medal. Well-known to all chemists is Johan Kjeldahl (1849-1900), for his method of determining nitrogen. S. P. L. Sœrensen (1868-1939) is known as "the father of *p*H." His development of the *p*H-scale has proved particularly valuable in the investigation of biochemical problems. J. N. Brœnsted is noted for his studies on many aspects of physical chemistry including the influence of the presence of saline substances upon the solubility of salts (electrolytes) and the kinetics of salt solutions. Niels Bjerrum has distinguished himself by his discerning application of the Planck quantum theory to the reading of the spectra of gases and has carried on important work on electrolyte solutions. Just before the war, the State established a fund of five million kroner for the endowment of Danish science in its relations with international research. This foundation bears the names of two men, Rask and Œrsted, who inaugurated the new era in Danish science. Furthermore, monies for scientific research were provided by the Carlsberg Fund, while during the war, research work has been carried out with the assistance of Danish industry under the leadership of the Academy of Technical Science.

Although actual war damage in Denmark is, fortunately, limited, with public utilities in working order, there is, of course, great need for raw materials, especially coal, for certain intermediate products, and for a wide range of consumption goods. Shipments of high-grade Danish agricultural products to this country have already provided welcome news in the British Press and, provided that feeding stuffs can be brought in, agricultural production will soon be restored to its pre-war level.

From what has been said in the above discussion of her chemical and allied industries, it is plain that Denmark will be anxious to import chemicals of every description and, more particularly, heavy chemicals, solvents, and dyes. As Table II shows, Denmark imported the greater part of her requirements of chemical products from Germany. In the supply of some products, Germany had a complete or nearly complete monopoly. It is hardly necessary to point out that there is now a large market for the export of British chemicals and it is to be hoped that, in the mutual interest of Denmark and Britain, trade relations will soon be intensified.

TABLE II
Denmark's Chemical Imports in 1937 (*in* 100 *kg.*)

Description of product	Main countries of origin: Gt. Britain	Germany	TOTAL (from all countries)
Sulphuric Acid ...	1,630	1,903	3,533
Hydrochloric acid ...	—	26,102	37,937
Nitric acid	—	16,865	16,865
Soda	905	194,817	198,447
Potassium Carbonate	9	6,676	6,730
Potassium Nitrate ...	3,072	374	3,446
Sodium Nitrate ...	593	407	1,113
Sodium Sulphate ...	—	23,045	23,144
Magnesium Sulphate	503	3,235	3,738
Barium Sulphate ...	820	9,727	10,836
Explosives	—	92	642[1]
Calcium carbide ...	—	16,861	33,259
Carbon tetrachloride	1,000	983	- 1,983
Glycerin	2,748	1	2,794
Butyl Alcohol ...	12	1,147	1,241
Acetone	203	1,000	2,025[2]
Plastic Powders ...	1,079	1,838	2,922
Dyestuffs	593	2,945	4,673[3]

[1], [2], [3] from Switzerland (in 100 kg.): 120, 306 and 1130 respectively.

Leaflet No. 271, issued by the KESTNER EVAPORATOR & ENGINEERING CO., LTD., 5 Grosvenor Gardens, London, S.W.1, replaces No. 154. It deals with the Kestner Improved Type Extraction Pump, which is specially designed for the extraction of liquor under a vacuum from evaporators, stills, reaction vessels, etc. A complete specification, and details of the materials of construction and of methods of operation are included.

In order to bridge the gap in information concerning their products during the present stage of production and paper shortage, the UNITED STEEL COMPANIES, LTD., Sheffield, have produced an "A-Z List of Products" detailing the materials produced by the associated firms in the group. Applications for copies should be addressed to the companies' sales offices in Birmingham, Newcastle-upon-Tyne, Glasgow, Leeds, London, Manchester, or Sheffield. The chemical industry will be particularly interested in the list of products derived from coal, supplied by the United Coke & Chemicals Co., Ltd., of Workington.

LETTERS TO THE EDITOR

The Chemist's Outlook

SIR,—Mr. McLachlan, in your editorial of July 7, has put his finger right on the spot when he says "the average chemist tends to look at life solely from the angle of truth." The ordinary citizen's life is based on probably 90 per cent. of emotion, and unless the chemist appreciates this factor he will probably only comprehend 10 per cent. of life as it is generally lived.

I often wonder whether lack of appreciation of this factor is the reason why so many able scientists and economists have such "left" political views. Their inescapable deductions from uncontrovertible facts produce a policy which deals with only 10 per cent. of life. There is no mathematics of freedom, love, greed, ambition, envy and service.—Yours faithfully,

L. O. KEKWICK,
Director,
Amalgamated Oxides (1939), Ltd.

British Scientific Equipment

SIR,—I hope that you can allow me to make it known to your readers that I have considered it necessary to warn the President of the Board of Trade that unless he is prepared to look after the interests of the industries making scientific equipment, and in particular certain members of the British Chemical Ware Manufacturers' Association (of which I am chairman), the supplies of many important materials and apparatus which we make will be seriously curtailed and export business will cease. This will be followed by loss of initiative and enterprise among our manufacturers and workers at a time when he whole future of Britain depends upon live, vigorous, and much more extensive research.

These industries, which are recognised by those who understand them to be the "master key" industries upon which our industrial system depends, have managed to keep going during the war and to meet in a very tardy fashion the demands of the Services. Many sections have been from six months to two years in arrears with their production, but somehow or other the most urgent calls have been met. At the present time the output of many firms is falling or is stationary, and every obstacle is put in our way when we attempt to prepare to play our part in the reconstruction of our national life and to develop the export trade which is essential.

In a letter of this kind I cannot give detailed information in support of my statements, but I am prepared to give it to anyone who is interested. No words of mine are strong enough to describe the appalling position in which the scientific industries of this country will find themselves if the various Government departments led by the Board of Trade do not do something to stop the rot which is setting in owing to the stupid and ignorant behaviour of our rulers over many years, which is continuing with unabated apathy at the present time. It is the duty of the Board of Trade to take prompt action and insist on every other department giving us the help we need, not in our interests, but in the interests of your readers and of the nation as a whole.

The fact is that no one at the Board of Trade knows what to do. They are also afraid that if they give us the assistance which some officials will rather grudgingly admit we are entitled to, they will create a precedent which will bring demands from other industries. Let them adopt the description "Master Key Industries" and treat us as such. They need not fear the jealousy of other industries if they enable us to serve those whom they think might be jealous.

Those who have any idea how these scientific industries are run in Germany or even in America realise that in many ways we are a generation behind. Vast sums must be spent on research and on training skilled scientific workers. We have a fine nucleus upon which to build. Let those who have power use it immediately to help us. If they have no power let them seek it before it is too late.—Yours faithfully,

NORMAN SHELDON,
Chairman, British Chemical Ware Manufacturers' Association.

Raw Materials for Plastics

SIR,—I have to thank Mr. F. R. King for pointing out the error in Part 2 of my article on Raw Materials for Plastics. The quantity of 32 million gallons exported does in fact apply to creosote, the error arising from a careless reading of the sub-headings in the Report of the Falmouth Committee.

Fortunately, the main argument of the article is not affected to any substantial degree by this inaccuracy for the salient fact remains, as stated in the quotation from the Report of the Hydrocarbon Oil Duties Committee, "that, of a total of 84 million gallons of crude benzol recovered in 1938 only 10 million gallons were used in the chemical industry." This low absorption of crude benzol by the chemical industry in this country will continue to be a predominant factor in any discussion of a future large-scale plastics industry. That over 30 million gallons of crude benzol were not recovered annually in the pre-war era is almost as serious a loss to the chemical industry as though this quantity actually were exported.—Yours faithfully,

DAVID D. HOWAT.

Personal Notes

MR. J. M. FANTO has joined the staff of the Power Gas Corporation, Ltd.

MR. C. S. GARLAND has been elected a Fellow of the Imperial College of Science and Technology.

DR. G. J. WILLIAMS has been appointed director of the School of Mines, Otago, New Zealand.

MR. J. P. V. WOOLLAM has been appointed a director of Simon-Carves, Ltd., and manager of their chemical plant department.

DR. A. G. QUARRELL has been appointed senior metallurgist to the British Non-Ferrous Metals Research Association and will take up his new post in October.

MR. J. DAVIDSON PRATT has been released from his appointment as Controller of Chemical Defence and Development at the Ministry of Supply to resume his duties with the Association of British Chemical Manufacturers.

MR. G. F. BARTRIP, F.R.I.C. who has been on the technical staff of B. Laporte, Ltd., Luton, for nearly thirty years, and has represented Laporte's and their associated companies in the Midlands area since 1921, has retired.

DR. E. W. SMITH, C.B.E., was unanimously elected president of the Institute of Fuel for the year ending October, 1946. This will be his third year of office. MR. J. F. RONCA, O.B.E., member of the Council, was unanimously elected honorary secretary of the Institute.

FROM THE BIRTHDAY HONOURS

On the right, Sir Edward Salt, chairman of the Parliamentary and Scientific Committee, who received the honour of knighthood; on the left, Dr. J. W. McDavid, managing delegate director, Explosives Division, I.C.I., Ltd., who was awarded the C.B.E.

SIR CLIVE BAILLIEU has been chosen as deputy-chairman of the Dunlop Rubber Company, to assist Sir George Beharrell, the chairman. This is the first time that a deputy-chairman has been appointed.

MR. W. T. VIZER HARMER, who was released from his post of Controller of chrome ore, magnesite and wolfram, from June 30, will continue to act as adviser to the Ministry of Supply.

At the request of Lord McGowan, the Minister of Aircraft Production has agreed to release MR. E. M. FRASER, Director-General of Aircraft Production. Mr. Fraser was previously Director of Investigation and Statistics at the War Office, which Department he joined from I.C.I. in July, 1939.

DR. D. C. MARTIN has been selected by the Council of the Chemical Society to succeed MR. S. E. CARR as general secretary. The following have been elected Honorary Fellows: SIR HENRY H. DALE, O.M., G.B.E., P.R.S., PROFESSOR V. M. GOLDSCHMIDT, PROFESSOR F. JOLIOT, and PROFESSOR H. C. UREY.

MR. NORMAN J. CAMPBELL, an Edinburgh solicitor, has been appointed by the National Federation of Associated Paint, Colour and Varnish Manufacturers of the United Kingdom to the new post of director of the Federation.

MR. J. C. COLQUHOUN, chairman and managing director of Manganese Bronze and Brass Co., has now joined the board of Lightalloys, Ltd., and has been elected chairman in succession to MR. W. H. GRIEVE, who died recently, while MR. W. S. KNIGHT has been appointed managing director.

The following have been elected members of the Institution of Chemical Engineers: M. H. BLAIR-MCGUFFIE, I.C.I., Ltd. (Dyestuffs Division) (transfer); R. FEATHER, Meggeson & Co., Ltd. (transfer); DR. F. A. FREETH, I.C.I., Ltd.; DR. T. U. MATTHEW, C.D. Factories (U.D.F.), South Africa; R. L. REES, London Power Co., Ltd. (transfer); C. H. REID, Ministry of Supply; R. W. REYNOLDS-DAVIES (transfer); P. K. STANDRING, I.C.I., Ltd. (Dyestuffs Division).

MR. F. L. BARRETT, a director of the Leyland firm of John Stanning & Son, Ltd., a branch of the Bleachers' Association, Ltd., of Manchester, has been appointed director of the new Bleachers' Association research laboratories which are being established in the Bolton area.

LORD BENNETT was elected to succeed DR. E. F. ARMSTRONG as president of the Royal Society of Arts at its 191st annual meeting last week. Dr. Armstrong was re-elected chairman for a third term, this action necessitating the suspension of a standing order.

Obituary

MR. EDWARD NORTON GRIMWADE, director of Drug Houses of Australia, Ltd., died at Macedon on April 29, aged 79.

DR. MARTIN H. ITTNER, chief chemist of the Colgate-Palmolive-Peet Company, has died at the age of 74. He was a past-president of the American Institute of Chemical Engineers and led the delegation from U.S.A. at the Chemical Engineering Congress in London in 1936.

MR J. RUSSELL TAYLOR, who died at Moncur, Perthshire, on June 30, was managing director of G. C. Taylor & Sons, tarpaulin manufacturers and chemical proofers, Dundee. He had been in the firm since youth, joining at a time when chemical waterproofing was introduced, and became a partner in 1917.

SIR WILLIAM ELLIS, who died at Sheffield on July 4, was Master Cutler of Sheffield from 1914 to 1918, and president of the Iron and Steel Institute for 1924-25. He was for many years managing director of John Brown & Co., Ltd. He also held the presidency of the Institution of Civil Engineers in 1925-26, and had been a member of the governing body of the Imperial College of Science and Technology and of the Advisory Council for Scientific and Industrial Research.

DR. WALTER MAKOWER, O.B.E., D.Sc., who died at Woolwich on July 7, aged 65, had been Professor of Science at the Royal Military Academy, Woolwich, in 1925-38, and was a member of the board of management of the Research Association of British Rubber Industries. Educated at University College School and University College, London, and at Trinity College, Cambridge, he worked for two years at the Cavendish Laboratory and then at Manchester, where he was University lecturer in physics and afterwards (1906-17) assistant director of laboratories. After two years' service in the Royal Navy, he became chief physicist to the Dunlop Rubber Company (1920-25). His principal publications dealt with the phenomena of radio-activity.

General News From Week to Week

In the Dunlop War Exhibition at the Royal Empire Society, Craven Street, London, W.C.2, some interesting details of about 400 war products may be seen.

Membership of the Royal Society of Arts continues to increase, according to the annual report of the Council, published last week, and now stands at 4047.

The manufacture of tennis and golf balls from synthetic rubber will begin shortly, but supplies for the home market will be limited for some time.

The Control of Iron and Steel (No. 42) Order, 1945 (S. R. & O. 1945, No. 814), which came into force on July 12, increases the prices of wire nails and certain types of forging ingots, and makes certain other alterations in the prices of various types of iron and steel supplies.

The Combined Raw Materials Board has made allocations of copper for the third quarter of 1945 to France, Italy, Switzerland, Holland, Sweden, Denmark and Spain. An allocation has also been made to UNRRA. Zinc is no longer subject to the Board's allocation scheme and supplies may be obtained from any source.

Licences to prospect for petroleum in an area of 198 sq. miles in Lancashire and Yorkshire, as well as in an area of 190 sq. miles in the counties of Durham and York, have been granted to the D'Arcy Exploration Co.

Leeds Corporation Finance and Parliamentary Committee records that sanction has been received for the borrowing from the Electricity Commissioners of £16,500 for the provision of a chemical laboratory and workshops at Kirkstall Power Station.

British Nylon Spinners, Ltd., a private company formed in 1940 by Courtaulds, Ltd., and I.C.I., Ltd., is increasing its nominal capital to £1,000,000 by the creation of £700,000 £1 ordinary shares. The new capital is required, in part, to finance the erection of a new plant at Pontypool.

The Control of Bolts and Nuts, etc. (No. 8), Order, 1945 (S. R. & O. 1945, No. 815), which came into force on July 12, revokes all previous Control of Bolts, Nuts, etc., Orders and removes all restrictions on the acquisition and disposal of bolts, nuts, screws, screw studs, washers and rivets. The maximum price provisions are remade in consolidated form.

The Widnes branch of the Chemical Workers' Union, after lengthy discussions, has reorganised the local leadership, and has started a "100 per cent. membership" drive in the Widnes chemical factories and allied trades. Mr. Jack Ashley is the new chairman, and Mr. J. Spence vice-chairman.

Matters relating to the production and distribution of fireclay and silica refractories will in future be dealt with by the Raw Materials Department of the Ministry of Supply, and the remaining activities of the Control will be carried out by the chrome ore, magnesite, and wolfram section of the department, under Mr. H. Halliday.

Representatives of I.C.I. and of the Gas Light and Coke Company attended the informal discussion arranged last Wednesday by the National Association for the Prevention of Tuberculosis at the London School of Hygiene. The subject under discussion was the after-care of the tuberculous, including re-employment.

An emergency training scheme for technical and craft teachers for full-time work in senior technical institutions and secondary technical schools is announced by the Ministry of Education. Admission will at first be limited to suitable men and women released from the Services or from other forms of national service. Application forms may be had from the Ministry of Education, 18 Lennox Gardens, London, S.W.1. [Envelope to be marked R.E. (Technical.)]

Foreign News

In British Guiana, experiments are being carried out to combat malaria with DDT.

A sulphuric acid plant is reported to be under construction in the Caicona region of Bolivia.

It is proposed to increase the daily productive capacity of the Ceylon Government glass factory from 1½ to 2½ tons.

A deposit of strontium sulphate (celestine) is being mined at Condorcet, about 20 miles to the east of Montélimar in France.

A new local section of the Chemical Institute of Canada has been approved for Vancouver Island. Mr. G. C. B. Cave was elected chairman, and Miss E. McLagan, secretary.

The production of eucalyptus oil in Northern Rhodesia, for use in the flotation process of copper extraction, as a substitute for imported pine oils, is a development worthy of further investigation.

Reports from Alsace say that the well-known potassium mines have suffered little damage as the Germans were unable to carry out their demolition plans. To the north of Mulhouse, out of 20 pits only three were damaged, but they can quickly be put back into working condition.

The State Department recently appointed 14 petroleum attachés to various countries to assist U.S. ambassadors in dealing with oil problems.

India's sulphuric acid production will be increased by 12,000 tons to 104,000 tons per annum by the addition of four plants now under construction.

A new phase in the war against malaria in East Africa was initiated recently, when low-flying planes circled the town of Dar-es-Salaam, spraying mosquito breeding-places with DDT.

An early completion of large-scale expansions of both production and research facilities is mentioned in the annual report of the well-known Swiss chemical and pharmaceutical company, F. Hoffman-La Roche & Co., A.G., Lausanne.

The Indian Government proposes to open a factory near the Tata Chemical Engineering Laboratory at Mithapur, in Bombay, for industrial research, on a semi-production basis or for any chemical processes sponsored by private individuals and found suitable.

Several Australian Government munition factories have been allocated to civilian production, including the manufacture of plastics by a Melbourne firm and of rayon at Rutherford, N.S.W., by the Burlington Pty., Ltd.

The New Zealand Petroleum Co., Ltd., has abandoned the search for oil in the Dominion after having spent about £1,000,000, provided jointly by Vacuum Oil, California-Texas Investments, and Shale Oil Investigations (representing Australian interests).

A new cement plant at Juan Soldado, Chile, is expected to commence production in July, while the Melón Cement Company is planning the construction of a large phosphate plant at Guayacán at a cost of some 50 million pesos.

Mica is being obtained in Sweden from new prospects on the eastern border of the Province of Jamtland. Production amounts to 1500 kilograms weekly and, when developed, will be able to supply the country's needs.

The Tasmanian Association of Scientific Societies has been established in order to promote a closer liaison between scientific societies in Tasmania and also to effect contacts between these societies and the community.

Non-ferrous metals imported from abroad or produced in India now come under the Non-ferrous Metal Control Order, 1945, which exercises control over the distribution of such metals as well as on releases from importers. No person can acquire from a producer more than 10 cwt. of any non-ferrous metal in one calendar month without a permit.

Some 45,000 United States patents of German, Japanese, and Italian origin are listed by the Alien Property Custodian for examination. The chemical patents and patent applications have been summarised and digested, and a complete set is available for $25 through the Office of Alien Property Custodian, Chicago 3, Ill.

In a study of the manganiferous ores of Spain (*Ion*, 1945, 5, 201), del Val Cordón and García Martín report that the Huelva ores (by far the most important in the country) analyse on an average 35-36 per cent. manganese and 28-29 per cent. silica, the richest deposits being from the mine "El Toro," with 44.91 per cent. Mn and 16.97 per cent. SiO_2.

Of the 195 business enterprises, in which the U.S. Alien Property Custodian (Mr. James Markham) has seized the German interests, sixty are reported to have had their German ownership "cloaked" in various ways. The most important of these firms are chemical manufacturing companies, and the largest single corporation was the General Aniline and Film Corporation, the principal American subsidiary of I.G., with total assets of $70 million. Of the 195 businesses, 117 are being liquidated and sold piecemeal; the other 78 will be sold to Americans as going concerns.

The Ouro Preto aluminium plant of the Cia. Electro-Química Brasileira, referred to in this column on previous occasions, has recently been completed. It will not only cover domestic needs, but will also supply requirements of other Latin American states. Annual output will reach 5000 to 6000 tons, leaving about 4000 tons for export. The plant is situated not quite a mile from the rich bauxite mines of the company. Caustic soda and other raw material will have to be imported for the time being. The enterprise is also engaged in the production of ferro-manganese alloys, exports of which go mainly to Argentina.

In Kenya the Mining and Geological Department is planning to improve facilities for ore-testing in order to assist the development of the mining industry. The war has stimulated interest in production of non-metallic minerals, kaolin, graphite, talc, kyanite, Kisii soapstone, asbestos, bentonitic clay and diatomite are now used in place of imported products. However, in spite of investigations over a considerable period, phosphates have not yet been found. On the other hand, it is reported that encouraging overseas orders have been obtained. A reconnaissance geological survey of an area of approximately 7000 sq. miles, including the Matthews Range, is nearing completion. An investigation is also being carried out to determine the resources of building materials available, more particularly in regard to sand, building stone, lime, bricks and tiles.

Forthcoming Events

July 17. Chemical Engineering Group (S.C.I.). Tallow Chandlers' Hall, Dowgate Hill, Cannon Street, E.C.4. Banquet for the Ladies: 12.45 p.m. Reception by Mr. and Mrs. M. B. Donald: 1.15 p.m. Luncheon; 4 p.m. Tea. Accommodation limited to 40 couples; price 35s. per head, including apéritifs, luncheon with wines, entertainment and tea.

July 18. Royal Institute of Chemistry (Birmingham and Midlands Section). English Theatre, The University, Edmund Street, Birmingham, 6.30 p.m. Dr. Dorothy Jordan-Lloyd: "Protein Fibres."

Company News

Commercial Alcohols, Ltd., report a net profit, for the year ended March 31, of $63,959 ($57,770). The dividend is $60,103 (same).

British Glues & Chemicals, Ltd., report a net profit, for the year to April 30, of £101,725 (£98,702). An ordinary dividend of 10 per cent. (same) has been declared.

Mula (Chemicals), Ltd., have increased their capital by £15,000 in 15,000 4 per cent. preference shares of £1 each, beyond the registered capital of £5000.

The Allied Chemical and Dye Corporation, N.Y., announces that the address of Aikman (London) and T. Tertius Aikman, European representative of the Barrett Division, is now 82m Portland Place, London, W.1. Telephone: WELbeck 8156.

Beecham Research Laboratories, Ltd., have increased their capital by £49,900 beyond the registered capital of £100. The additional capital is divided into 49,900 unclassified shares of £1. Of the original 100 shares, 92 were allotted to Beechams Pills, Ltd.

F. Hoffmann-La Roche & Co., A.G., Lausanne, report a gross profit, for 1944, of fr. 17,490,000 (fr. 17,838,000). Net profit totals fr. 3,533,590 (fr. 3,679,667). A dividend of fr. 40,50 (same) and a bonus of 40,50 (same) have been declared.

The Morgan Crucible Co., Ltd., reports a trading profit for the year, to March 31, of £488,391 (£794,219). Net profit totals £322,720 (£207,119). A final dividend of 1s. 6d. (1s. 3d.), making a total of 2s. 3d. (2s.) or 11¼ per cent. (10 per cent.), was declared. A capital bonus of 6d. (same) for £1 stock is also being paid.

Standard Chemical Company, Ltd., in view of many favourable opportunities for expansion in the chemical field, approved the issue of 10,000 shares of 5 per cent. preferred stock of $100 par value, out of an authorised issue of 50,000 shares, and of 70,000 shares of additional common stock in order to finance future projects.

Commercial Intelligence

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

Company Winding-Up

CUMBERLAND LIMESTONE CO., LTD., Aspatria. (C.W.U., 14/7/45.) Winding-Up Order, June 20.

New Companies Registered

Universal Purifiers, Ltd. (396,634).—Private company. Capital £2000 in £1 shares. Suppliers of industrial equipment and services, etc. Directors: H. Ward-Dennis, T. W. Dickinson. Registered office: Planet House, 12a Finsbury Square, E.C.2.

Freez-Seal Equipment Company, Ltd. (396,706).—Private company. Capital £100 in £1 shares. Water, gas, refrigerating, and electrical engineers, analytical chemists, bacteriologists, etc. Directors: Alice C. Young, Evelyn Gledhill, H. D. Galvin, G. R. D. Shaw. Registered office: 245 Burlington Road, New Malden, Surrey.

Pesticide (D.D.T.), Ltd. (396,785).—Private company. Capital £5000 in 600 ordinary and 4400 6 per cent. non-cumulative redeemable preference £1 shares. Manufacturers of, and dealers in, insecticides, vermin destroyers, etc. Directors: Major W. J. L. Williams, D. Hayman. Registered office: 11 Jubilee Place, Kings Road, London, S.W.3.

M. M. (Manchester), Ltd. (396,776).—Private company. Capital £1000 in 1000 £1 shares. Coppersmiths, copper smelters, copper sulphate manufacturers, copper tube makers, brass and bronze manufacturers, sheet metal and tinplate workers, etc. Subscribers: A. G. Arnfield, J. A. Martin. Registered office: 44 Brazennose Street, Manchester.

Chemical and Allied Stocks and Shares

STOCK markets have become somewhat hesitant, last week's rise in industrial shares having been followed by a little profit-taking. Sentiment reflected a disposition to await the result of the General Election, but British Funds were firm and maintained recent gains. Industrial shares were not without good features, and although not holding best prices, were higher on balance. Imperial Chemical were 40s., and Turner & Newall 84s., while Lever & Unilever firmed up to 50s. after an earlier decline.

Iron and steels were favoured on satisfaction with recent dividend announcements. Guest Keen at 40s. 10½d. xd were bought on the good yield shown on the higher dividend, while United Steels moved up to 26s. 9d. on the company's capital plans. Dorman Long strengthened to 28s. 6d., Ruston & Hornsby to 52s. 6d., and Powell Duffryn were firm at 22s. 9d. on the good balance-sheet position. Thomas & Baldwins 6s. 8d. units firmed up to 12s. 10½d., and Consett Iron at 9s. 7½d. remained under the influence of the increased dividend. Stewarts & Lloyds at 55s. 9d. were little changed. Tube Investments transferred up to £5⅝. Richardsons Westgarth 5s. ordinary strengthened to 6s. 7½d. on dividend hopes, while on satisfaction with the results, Allied Ironfounders were firmer at 51s. 3d. xd. Babcock & Wilcox moved higher at 58s. 9d. and generally there has been a disposition to favour shares of companies likely to play an important part in regaining export trade. Textile shares were favoured in this connection and were generally higher on balance, although profit-taking reduced earlier gains. Calico Printers were 19s. 9d., Bradford Dyers 25s. 3d., Fine Spinners 25s. 4½d., Lancashire Cotton 38s. 3d., and Coats 53s. 9d. Courtaulds were 56s. 3d., and British Celanese 33s. 9d.

Results of British Plaster Board created a good impression, and the 5s. shares were firm at 38s. xd. The maintained dividend is payable on the larger capital resulting from the deal with the Distillers Co. in respect of the plaster board assets of the later. The units of the Distillers Co. showed a further rise at 118s. 9d. Associated Cement have been steady at 60s., awaiting the results, and Crittall Manufacturing at 28s. 6d. were higher again. Metal Box shares also moved higher at 93s. 3d. A small feature was the demand for the 1s. shares of the Cementation Co. which rose to 5s. 7½d. Borax Consolidated deferred were in demand up to 43s. 3d. British Match rose to 43s. 1½d., British Aluminium to 43s., and General Refractories 10s. shares strengthened to 16s. 10½d. B. Laporte kept firm at 87s. 6d. British Drug Houses remained active and at 40s. 6d. were higher again, the assumption in the market being that, when further capital is required, shareholders may be offered additional shares on favourable terms.

Triplex Glass moved up further with shares of motor manufacturers, but at 44s. lost part of their rise. United Glass Bottle changed hands around 76s. 3d. Canning Town Glass 5s. ordinary were 9s. 6d., and Forster's Glass 10s. ordinary 38s. 9d. Cellon 5s. ordinary were 26s. De La Rue advanced further to £11½, awaiting the full results, British Industrial Plastics 2s. shares were more active at 7s. 1½d., and Erinoid 5s. ordinary were 11s. 6d. Lewis Berger attracted increased attention and were in demand up to £6. W. J. Bush were quoted at 73s. 9d. Dunlop Rubber, after changing hands over 52s., eased to 51s. 9d. Barry & Staines were good with a further advance to 54s. 6d., and United Molasses 43s. 7½d. International Paint moved up to 121s. 3d., and Goodlass Wall 10s. ordinary were active

up to the higher level of 24s. 6d. Sangers strengthened to 30s. 6d. awaiting the dividend announcement. Boots Drug transferred around 57s. Oil shares failed to hold earlier gains.

British Chemical Prices

Market Reports

MOST sections of the London general chemical market report reasonably satisfactory trading conditions, taking into consideration the difficult supply position in some sections and the summer holiday period. Deliveries against existing contracts cover substantial amounts and values throughout the market display a strong undertone. A fair volume of fresh inquiry is reported both for home and export account. Among the soda products a continued demand is reported for bicarbonate of soda, Glauber salt and salt cake, with inquiries for supplies of acetate and nitrate of soda well maintained. The limited quantities of bichromate of soda are quickly absorbed, while a steady trade is passing in the hyposulphites of soda. The majority of the potash products are available in restricted quantities and a brisk trade is reported in acid phosphate of potash. Available supplies of solid caustic potash, bichromate of potash, and yellow prussiate of potash are quickly absorbed. Active conditions are reported from the coal-tar products section both for new business and for contract deliveries. The benzols and toluols are in good request and a quiet export business is passing in pitch, with home trade users taking up fair quantities.

MANCHESTER.—Prices remain on a firm basis in almost all sections of the Manchester market for heavy chemicals, though not much in the way of actual change has to be recorded. Annual "wakes" stoppages in some of the smaller Lancashire towns tend to slow down deliveries, though on the whole the position in this respect is satisfactory and specifications for caustic soda and most of the other leading soda compounds cover reasonably good quantities. A fair trade is passing in lump alum, alumina sulphate, and the ammonia and magnesia products. Most of the fertilisers are seasonally quiet. Among the by-products the leading light and heavy materials are being taken up in reasonably good quantities against existing commitments and some moderate additional bookings have been made.

GLASGOW.—In the Scottish heavy chemical trade business has been in moderate demand during the past week for home business, with no actual changes to report in prices. Export inquiries are being received regularly.

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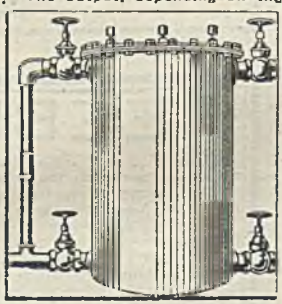

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