

# The Chemical Age

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## Notes and Comments

### The Search for Oil

**A** PPLICATIONS for licences to search for petroleum in Britain are to be made under the regulations framed under the Petroleum Production Act, 1934. The regulations have been placed on the tables of both Houses of Parliament and will become effective, if not disapproved, within twenty-eight days. Applications may be made as from June 17. Provision is made by the regulations for prospecting and mining licences. The prospecting licence has a period of three years, which may be extended year by year to a maximum of five years. The mining licence is for fifty years, which may be extended to a maximum of seventy-five years, while both will be issued only for reasonably large areas. Clauses deal with questions such as the avoidance of harmful methods of working, the protection of mines and coal seams, the disposal of waste oil, salt water and refuse, the health and safety of workers, the minimum distance of bore holes from the boundaries of the licensed area and the deposit by the licensee of security.

The petroleum regulations permit applications for licences from foreigners and from companies incorporated outside Great Britain, provided an operating company is formed and registered in this country. The licensee will have a monopoly in his own area, and the rate of royalty on crude oil, which is paid to the Board of Trade, shall never be less than 3s. a ton or more than 6s. a ton. Royalty on casinghead petroleum spirit recovered shall not be less than one-eighth of a penny a gallon, and shall not exceed twopence a gallon. The Board of Trade may require that products be sold for consumption in Great Britain or Northern Ireland. The holder of a prospecting licence must carry out a scheme to be agreed with the Board of Trade and set out in a schedule to the licence. The application fees payable will be £20 for a prospecting licence and £40 for a mining licence. The security deposit will have relation to the size of the area—£6 a square mile in the case of a prospecting licence, subject to a minimum of £400 for a prospecting licence and £1,000 for a mining licence. Special provisions apply if the licensee becomes controlled by an alien company or company incorporated outside Great Britain.

### Progress in Technical Development

**I**N the continual effort to develop new processes and new products it is quite often the unexpected that happens, as any research chemist knows. Sometimes a predetermined line of research may result in a discovery of quite a different character, almost by chance. Sometimes further advances are the logical outcome of

what has gone before, though usually in that event the directing mind has been singularly alert and inventive, for few researches proceed on an even keel throughout the voyage. Sometimes, again, external events make their impress upon the progress of a research and change its course into another direction. All this, of course, is the commonplace of technical development. The protection of wooden piles used in sea-water presents certain difficulties because it is not only the action of the sea-water that has to be overcome, but also the action of the living things that have their home in the sea. Cement has been used to protect the piles, but not always with success, because of certain difficulties that arise in connection with its use.

It may well be suspected that the idea occurred to someone that if a substance poisonous to life was incorporated in the cement or in the wood, the destructive proclivities of the local "inhabitants" would be checked. From this work came the observation that arsenic has a value when used as a constituent of cement. A process has now been developed in Sweden for the protection of wood soaked in sea-water (piers and harbour work) in which concrete mixed with an unstated quantity of arsenic is used for coating the wood. The admixture of arsenic helps the cement to adhere to the wood and confers sufficient elasticity to prevent the cement coating from peeling off. Sand and cement (4:1) are mixed dry with the arsenic salt, and conveyed through a hose to the places where the piles are to be treated. The powder is mixed with water and immediately blown on to the piles with a double nozzle. The coating dries in 15 minutes and the piles can be handled without injury to the coating. The operators work from a barge so that the powder that does not stick drops into the water and does not spread, and masks and gloves are worn. It will be interesting to see if this process provides any considerable additional outlet for arsenious oxide, in which form the arsenic appears to be used.

### New Use for Synthetic Resins

**O**NE of the major problems of a few years ago was to provide a use, other than that as fuel, for the oils produced by the low temperature carbonisation of coal. These oils are so unlike those contained in normal coal tar that tar distillers and manufacturing chemists were in a quandary to know what to do about them. Not unnaturally, most tar distillers refused to have anything to do with them. In this impasse, the Fuel Research Board handed the problem to the National Chemical Laboratory whose staff has been

working on it ever since. One of the prime possible uses of a large portion of the constituents of low temperature tar is a raw material for the manufacture of synthetic resins. That fact was no doubt largely responsible for causing the Department of Scientific and Industrial Research to pay considerable attention to synthetic resins. A potentially highly important discovery has been made that certain synthetic resins—not, by the way, derived from low temperature tar—can be used to remove the inorganic constituents from sea-water. Four tubes are employed for the purpose in the experimental apparatus, the first and the third being filled with particles of a resin prepared from formaldehyde and tannin materials, the second and fourth tubes being filled with resin prepared from aniline. The first and third tubes remove the bases and the third and the fourth, the radicles; this separation of such stable compounds as sodium chloride into base and radicle by the action of synthetic resin is an exceedingly interesting process and may lead to a new form of water purification having applications in many other industries. The application of this process of purifying sea-water, if in practice it proves as sound as it appears to do in the laboratory, will help shipping by avoidance of the need for taking on board the large supplies of fresh water that are now necessary. It will also affect the novelist, who must either place his story of waterless shipwrecked mariners before the year 1935, or must account for the loss of non-functioning of the water purification apparatus before he can picture harrowingly the poor sailors with "water, water, everywhere, but never a drop to drink."

### The Oil Situation

**M**EANWHILE, the original work upon resins, the effort to found a new tar distillation industry based up low temperature tar appears likely to be nullified by the change in the oil situation. Sir John Cadman has recently lectured before the Institute of Fuel upon the construction of the Iraq pipeline. Into the details of that fascinating story it is not necessary here to go, but it is sufficient to state that the pipeline along which the oil flows is 12 in. in diameter, is buried 5 ft. into the sand of the desert, and is no less than 1,200 miles in length. That is virtually the only British-controlled oil supply, and it does not run through British territory. The expansion of the Royal Air Force brings the problem of a safe oil supply still more prominently into the forefront of the national picture; it is indeed of no use building either ships or aeroplanes if we have not the fuel to move them. The regulations under the Petroleum Act of 1934 for licences to bore for petroleum come into force on June 17, but—as we indicated in 1934—can hardly be expected to affect the home oil supply problem in the slightest. The plain fact remains that the country is dependent for its home oil supply and therefore for its safety upon the chemical industry. The success of the hydrogenation plant might be one of the most important events in our national life for some centuries.

### Shorter Working Hours

**S**HORTENING of working hours without reduction in wages appears to be the secret of the solution of the problem created by the introduction of labour-saving methods in industry. So far as the purely commercial results are concerned it is immaterial whether

the hours per day or the days per week are curtailed, although, as we were among the pioneers of the five-day working week, we are naturally biased in favour of the Saturday closing. Everywhere employers are looking for means of avoiding the displacement of workers by the advent of machinery, and it is pleasing to learn from the British Glass Convention at Folkestone last week of the successful measures adopted by Pilkington Brothers, Ltd., at St. Helens. Mr. G. L. Pilkington, in his presidential address, told the congress how his firm had introduced a proposal to the St. Helens Plate and Sheet Glass Industrial Council, which, after consideration, announced its approval of the scheme, which was put into operation for a trial period of six months. Working hours were shortened from 46-48 hours to 42 hours per week and in principle, except in the case of certain piece and bonus workers, a man received the same weekly wage for the shorter hours as he had received for the longer hours. The employers obtained certain concessions for week-end overtime in the process and paid no extra time to the day workers. The comparative results for the six months before and six months after the inception of the scheme showed that the reduction in hours per person was 10 per cent., the increase in output was 15 per cent., the increase in the number of employees was only 8.4 per cent., and the output value per man went up by 11.4 per cent. The average weekly earnings were unchanged.

Introduced originally as an experiment, the scheme at St. Helens became a permanent arrangement last year. If it is possible to apply the system to one part of an industry it is worthy of consideration by others. Probably the outstanding example of the advantage of shorter hours in the chemical industry is the case of Boots Pure Drug Co., Ltd., which introduced the five-day week at Nottingham as an experiment last year and found it so successful that it made it a permanent arrangement after an independent report had been prepared by Sir Richard Redmayne at the request of the Minister of Labour. The effects in regard to enhancement of health and contentment, regularity of attendance at work and diminution of absenteeism were very marked after the introduction of the five-day week. The employees themselves were enthusiastic in regard to the experiment and viewed with dismay any suggestion of a return to the old five and a half day week. In his report Sir Richard Redmayne suggested that the experiment might be applied at many other works and we believe that this possibility has since been considered in many directions.

## Koppers Circulation Ovens

### A Contract from France

A CONTRACT has been signed for the erection of a battery of 23 Koppers circulation coke ovens in the Pas-de-Calais coal-field for the Compagnie des Mines de Houille de Courrières at Billy-Montigny. This plant, which is to produce high-grade metallurgical coke, consists of large modern ovens 4.2 metres (13 ft. 10 in.) in height and 40 ft. in length. The mean width of the oven chamber is 435 mm. (17 in.), each oven holding 14 tons of coal. The carbonising time varies between 25 and 19 hours, according to the type of coke to be produced, so that the capacity of the battery is from 308 to 406 tons of coal per day. Since the Koppers circulation oven was first introduced in 1929, no fewer than 1,052 of these ovens have been ordered, and it is noteworthy that this period has included the years of industrial depression during which coke oven construction, like that of other industrial enterprise involving capital expenditure, had nearly ceased.

# Interesting Facts about Driers and Alkyds

## Dr. W. Krumbhaar Relates His Experiences

IN spite of a wide literature it is quite usual to encounter problems in connection with driers which are difficult to answer. Examples are loss of drying strength of paints and varnish and the discolouration of driers, said Dr. W. Krumbhaar, in a paper read before the Manchester Section of the Oil and Colour Chemists' Association on May 17. To follow some of these questions he discussed in some detail the peroxide content of certain solvents, especially turpentine, together with the changing valence stages of metallic driers. This leads to the consideration of the valence of metals in relation to their drying effect and the catalytic influence of colloidal dispersed materials. An incursion into the field of alkyd resins and the resin-forming reaction are of interest.

### Peroxides in the Turpentine

Differences in drying power of varnishes containing turpentine, dipentene or pine oil are well known, and it has been observed that such variations are consequent upon such factors as new or oxidised turpentine being used or whether thinned at high or low temperatures. These changes are controlled by the peroxides in the turpentine. The peroxides can be determined quantitatively by means of an aromatic thio phenol, cymene mercaptan, which is rapidly oxidised by peroxide oxygen. The estimation is carried out by adding excess of cymene mercaptan to the turpentine under examination and back titrating the excess with alcoholic iodine solution. The method is quite suitable for laboratory procedure and can be carried out by allowing the turpentine and cymene mercaptan to react for 36 hours, after which the titration with iodine is completed. A convenient method of expressing the peroxide is as milligrams of peroxide oxygen per c.c. of turpentine.

By using this method it is possible to estimate the peroxide content of the various types of turpentine and so obtain information of the effects of heating, prolonged storage and oxidation on the material. Turpentine which has been stored in tanks or casks gives a figure of 1 mg. per 1 c.c., and since 1 mg. of oxygen is of similar volume to 1 c.c. of turpentine such material contains its own volume of active oxygen. Increase in the peroxide content is not obtained by simple exposure to air except in a thin film, when some resinification takes place. In such cases the rise is to approximately  $1\frac{1}{2}$  mg. per c.c. Blowing and agitation, however, can be effective in obtaining a maximum content of  $2\frac{1}{2}$  mg. per c.c. Beyond this point it is not possible to proceed, even with the use of catalysts.

Heating of a sample of turpentine containing  $2\frac{1}{2}$  mg. per c.c. for  $\frac{1}{2}$  hour at 100° F. results in a fall to 2 mg. per c.c., whilst  $\frac{1}{2}$  hour at 200° F. produces a fall to  $1\frac{1}{2}$  mg. per c.c. A minimum content of 0.5 mg. per c.c. is obtained by heating under a reflux condenser and this amount is stable under distillation, hence, newly-distilled turpentine contains 0.5 mg. per c.c. Prolonged storage of samples containing 0.5, 1.0, 1.5 and 2.5 mg. active oxygen per c.c., under conditions which do not allow of evaporation but which allow ingress of air, show that they all become similar in peroxide content. That is, they arrive at a state of equilibrium at 1 mg. per c.c.

### Peroxides as Catalytic Driers

Practically, importance of these results can be shown from the fact that a varnish batch thinned in separate portions with turpentines having different peroxide contents give interesting results. The sample with a peroxide content in the turpentine of 0.5 milligrams per c.c. dried in 14 hours; with 1.0 milligrams in six hours; with 1.5 milligrams in four hours; with 2.5 milligrams in two hours. If, however, the samples are allowed to stand for several months, it is found that the drying times of all are in the region of six hours, the reason being that the peroxide content of the turpentine has come to the state of equilibrium.

Differences are found which can be explained along these lines, between varnishes which are thinned hot, and those thinned at ordinary temperatures. Here again, the differences disappear on storage. An important point is that the peroxides are not themselves driers, but only operate with catalytic driers. Peroxides of this nature also exist in hydro-

genated naphthalenes, such as tetralin, and these can be estimated by means of titrating the iodine liberated from potassium iodide with standard thiosulphate solution. The use of Benzoyl peroxide as a drying agent is remarkable, though 1-2 per cent. is necessary, and here again the catalytic action of metallic driers is necessary.

Turpentine of a known peroxide content is particularly suitable for investigating the valence of manganese and cobalt driers which exist in both di- and tri-valent forms or mixtures of both forms. The familiar colour changes observed by adding turpentine to solutions of cobalt or manganese resins are merely visible changes of the metals from one oxidation stage to the other. By means of such a distinct colour change it is possible to follow the transition quantitatively, particularly with cobalt salts, since, by titration with turpentine of known peroxide content, the point at which a pure green colour is obtained shows when two molecules of cobalt oxide have taken one molecule of oxygen. Further additions of turpentine do not produce any further colour change, thus proving that cobalt compounds of a higher valence do not exist. These tests can be equally well carried out on oleates, stearates or naphthenates as well as resins.

### Investigation of Valence Changes

Blue cobalt compounds are also oxidised to the green form by peroxides present in tetralin, hydrosol, solvesso, etc., whilst the peroxides of linseed oil and those present in varnishes act also in a similar manner. The visible effect of these changes is an apparent bleaching of a film, since the green colouration is complementary to the yellow-reddish colour of the linseed oil or varnish. This method of investigating the valence stages by means of turpentine can be applied to manganese salts in much the same way as for cobalt, but in this case the point of final oxidation is not so easily recognised, since, commencing with a light yellow colour, it gradually darkens to a maximum point. The maximum brown colouration occurs when one molecule of oxygen has been added to two molecules of manganese oxide, indicating that the change is from the divalent to the tri-valent stage.

It is of interest to apply this method of determination to commercial driers and especially those made in varnish plants. Experience along these lines shows that both valence stages exist at the same time and that the ratio fluctuates considerably. There is a distinct difference in characteristics of the valence forms of cobalt and manganese. Cobalt rapidly assumes the trivalent form, whilst manganese under similar conditions takes several hours and only completes its change when the paint film is completely dry. The slow transition makes possible a comparison of the drying power of the two valence stages of manganese, and for this purpose equal amounts of di- and tri-valent compounds are added to oleo resinous varnishes and dried under similar conditions. The results of such an experiment show that the trivalent form is capable of completing the drying in several hours less time than the divalent form. Since this would suggest that the trivalent salt is in a more suitable form to liberate oxygen, it may be of practical importance.

### Stages of Oxidation

To apply this method of investigation to the valence changes in lead driers would be of interest, but, unfortunately, there is no distinct colour change to mark the transition. It can, however, be applied to cerium compounds which pass from a light green to a distinct orange colour when turpentine is added.

Observations on the different stages of oxidation give support to the theory that the drying effect of metals is connected with valence changes in that the metal in the trivalent stage gives off oxygen, itself returning to the divalent when it again becomes oxidised in air to the trivalent, the process continuing repeatedly. Along this line there is probably an explanation of the difference between cobalt and nickel in drying properties. Since nickel does not exist in the trivalent form under ordinary conditions, it is easy to understand its inert nature as a drier. The question of most importance is whether polyvalence is necessary to the dry-

ing action, and in this connection zinc and calcium might be cited as existing in only one stage of oxidation. It should be mentioned that these metals are only weak in action, and it seems to be established that for effective drying polyvalency is required.

It is well known that metallic catalysts used as driers are also effective in accelerating polymerisation of oils and also the resin-forming reactions of alkyl resins. It is not possible to discuss the process in detail, but some of the rules governing resinification in the glycerol phthalate field can be pointed out. Materials with only one reactive group, such as monobasic acids and monohydric alcohols, do not form resins either with a polyreactive acid or a polyhydric alcohol. For instance, stearic acid does not react with either ethyl alcohol or with glycerine. A second rule requires the reacting substances to have more than one primary valence bond in order to make resin formation possible. Thus, two carboxyl groups or hydroxyl groups at least are required in the acids and alcohols used. This restricts the number of resin-forming alcohols, and the most important is the glycerine and phthalic anhydride combination.

These principles apply to the non-modified alkyl resins, but the majority of types now marketed are modified, and little has been mentioned of principles involved in the addition of either incorporated or chemically-combined materials. Simple addition of plasticisers such as tricresyl are not very satisfactory, and chemical modifications involving the use of molecular quantities are best suited. Drying oil and fatty acids impart their own properties, and these vary according to the number and positions of the double bonds. Modification with long paraffin chains produces increased oil-solubility in proportion to the length of the chain, but does not impart drying qualities. Introduction of fatty resinous

or waxy substances produces flexibility, but not of the type obtained by substituting polybasic acids with long distances between the carboxyl groups, for example, phthalic acid. Abietic acid imparts oil-solubility and hardness, whilst fossil gums produce high melting points. Urea formaldehyde is incorporated to impart light colour and to obtain colour retention, whilst phenolic resin-forming materials give hardness and chemical inertness.

Alkyl resins modified with phenolic resins are highly versatile and universal, and those resulting from the use of phenolic condensation products discussed in the Hoelzel patents are of special interest. These materials react to link up with any hydrogen atom of some reactivity in hydrocarbon structures. These phenol di-alcohols are especially useful in that they react with hydrogen atoms which were previously considered to be inert and produce a double tie which produces very stable compounds of great technical value.

To return to the problem of oxidation, it is interesting to consider whether metals in colloidally-dispersed form accelerate drying of oil. Lead, manganese or cobalt can be dispersed colloidally in butyl alcohol by use of an oscillating electrical discharge, and such dispersions are fairly stable. These colloidal solutions can be further stabilised by being thickened with oil immediately after dispersion. Of the three metals, lead is the most easily dispersed, but gives very dark solutions which, when added to linseed oil, quickly become much paler, the lead going into solution. In the case of manganese dispersions, the rate of solution is very much slower, and the effect on the drying of the oil can be watched. The results of these investigations is to establish that only when the metal has passed into solution does it exert a drying effect, and that the colloidal dispersions of metals have no catalytic drying action.

## The "Bloom" of Oils

By J. A. RADLEY, M.Sc., A.I.C.

THE "bloom" or fluorescence of petroleum distillates is one of their most striking properties, the heavy greenish fluorescence of Pennsylvanian crudes being very characteristic. For some time the origin of this fluorescence was unexplained; Engler suggested colloidal phenomena as the cause, Schulz supported this view with the observation that addition of "deblowing" agents, *e.g.*, nitrobenzene or nitronaphthalene, having a high refractive index would make such a colloidal system optically homogeneous and thus would be expected to destroy the fluorescence. In 1914 the question was settled by B. T. Brooks and R. F. Bacon, who separated from 12 litres of lubricating oil 1 gm. of a highly fluorescent compound which was responsible for the "bloom."

At some refineries oils are produced having no bloom, and in other cases compounds, *e.g.*, the nitro compounds previously mentioned, were, and are, added to destroy the bloom. Sulphur dioxide will also destroy the fluorescence, the amount to produce this effect varying from 0.3 mgm. to 0.4 mgm. per c.c. for Russian and some American oils respectively.

The demand, more particularly in America, for an agent to induce a fluorescence in non-fluorescent stocks, similar to that shown by Pennsylvanian crudes, has led research chemists to turn their attention to this field. If an oil having no bloom be coloured and made to bloom by the addition of such an agent, the resultant mixture appears to have a very much greater viscosity. The illusion is very striking, a treated light machine oil simulating the appearance of a fairly heavy lubricating oil, due to the thin layer of oil on the sides of the container after shaking being visible by virtue of its fluorescence. Several patents have already been taken out covering the use of certain compounds for addition to oils to gain this effect. The first successful preparations were obtained by extracting the fluorescent bodies from coal-tar pitch by a variety of methods. The pitch was either treated with the oil, which was then clarified with Fuller's earth or other absorbents which remove the pitch but not the required fluorescent compounds, or the extract of the pitch in petroleum ether was added to the oil.

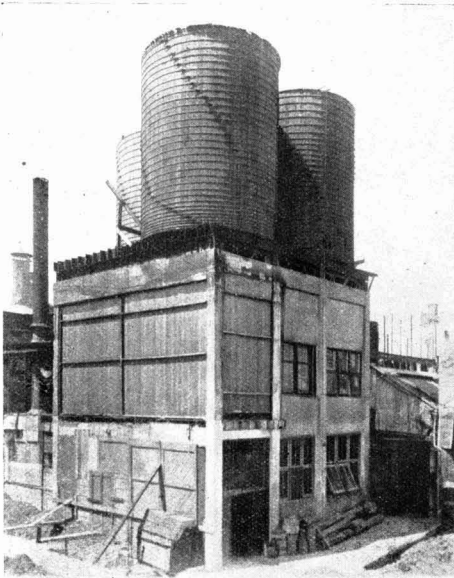
Following on these early attempts come the more rational methods of synthesis. To obtain a fluorescent body a com-

ound with a ring system is required, and the greater the number of rings the more is its emission spectrum likely to be in the visible spectrum. Certain groups occurring in conjunction with these systems increase the intensity of the fluorescence and, incidentally, in some cases, increase the oil solubility of the compound. From a definite idea such as this work can be undertaken to produce such systems, and the I. G. Farbenindustrie have taken out several patents covering the use of amino-2-phenylbenzothiazole, an amino-2-phenylbenzoxazole, and water- or alkali-insoluble perylene derivatives. They have also covered the use of complex condensation products of the benzanthrene series obtained by heating benzanthrene or dihydrobenzanthrene, benzylnaphthalene, etc., with a metallic oxide at 600-800° C. or in the liquid phase with sulphur, selenium, lead dioxide or aluminium chloride. The Standard Oil Co. cover the use of condensation compounds obtained by condensing polycyclic aromatic hydrocarbons with others using aluminium chloride. J. W. Orelup uses dinaphthylene with compounds such as arylaminoanthraquinones to obtain both antiknock and fluorescent effects.

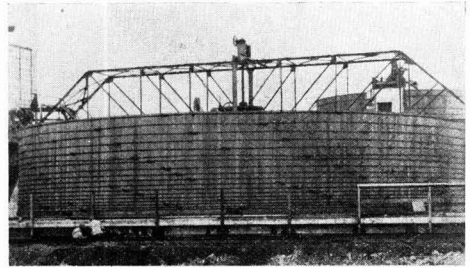
Dyestuffs, alone, rarely appear to impart a fluorescence to an oil in which they are dissolved, but Orelup has overcome this defect by heating together an insoluble soap, such as aluminium stearate, stearic acid and a dyestuff of the eosine, rhodamine or acridine type. The soap in this case solubilises the dyestuff in the oil and assists in developing the fluorescence. Cassidy heats acridine orange with naphthenic acid, then dilutes with a petroleum hydrocarbon and continues the heating whilst agitating the mass. Muir has found that oils which tend to "gum" on exposure develop a green or a yellow fluorescence instead of the blue or violet colours usually shown.

PRODUCTION of uranium salts is an important part of the refinery operations of Eldorado Gold Mines, Ltd., Canada's pioneer producer of radium and uranium, and the company reports a ready market for the output. Approximately 60,000 lb. have been produced to date, chiefly orange and yellow sodium uranate and black oxide.

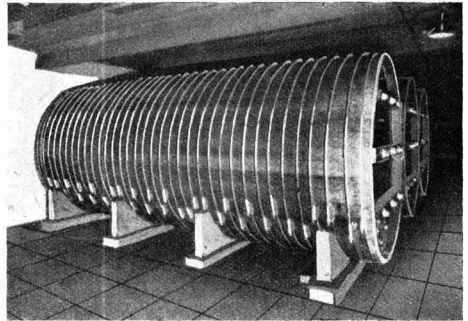
## California Redwood as a Construc-tional Material for Tanks and Vats



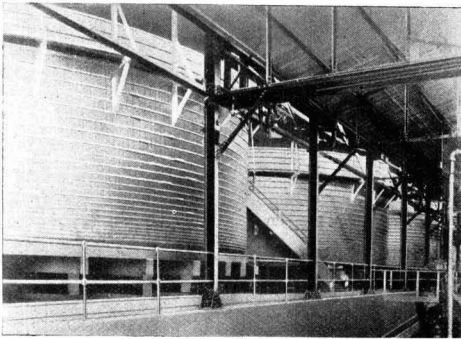
Redwood Tanks showing slightly charred surface as only effect of severe fire exposure that totally destroyed tanks made of other woods.



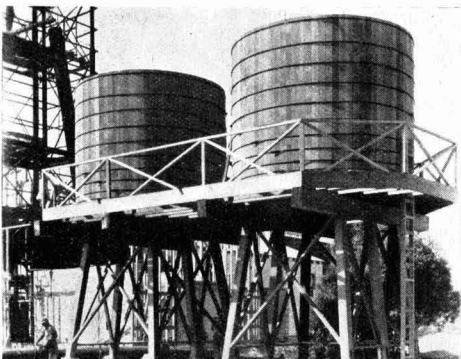
Redwood Tanks with agitator mechanism at chemical works.



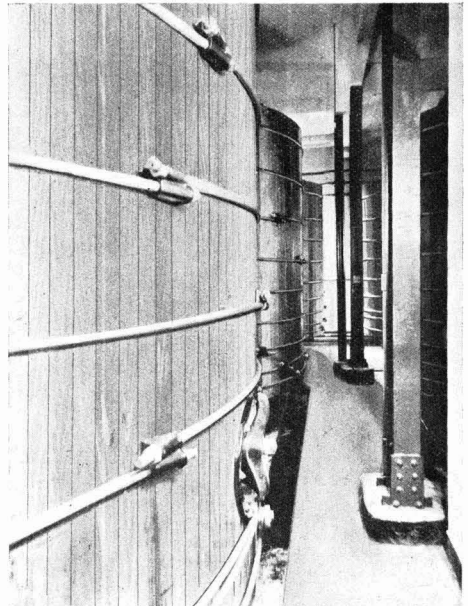
Redwood Pressure Storage Tanks with heads braced by steel tie rods: this type of tank is designed to carry a load of 75 tons on the braced head.



Large Redwood Tanks containing acid solution and slimes in large scale mining operations.



Redwood Tanks for industrial use, subject to outdoor exposure and frequent filling and draining.



Redwood Tanks, showing constructional details.

*Reproduced by courtesy of The California Redwood Association, and Flatau, Dick & Co., of London*

# Financial Position in the Chemical Industry

By S. HOWARD WITHEY, F.C.I.

DURING the past year many concerns in the chemical and engineering industries have participated in the benefits of general trade recuperation, with the result that profit margins have been more satisfactory and in some instances dividend rates have been increased.

At £7,965,038, the balance of gross profit realised by Imperial Chemical Industries, Ltd., represents an increase of £301,093 in relation to the previous year's figure and establishes a new high record for this great combine. The central obsolescence fund received the usual allocation of £1,000,000, and, after providing £615,931 for taxation, the net profit worked out at £6,349,107, which compares favourably with £6,001,605 in 1933. The ordinary dividend has consequently been raised from 7½ per cent. to 8 per cent., and the deferred dividend from 1 per cent. to 2 per cent., while £1,000,000 has been transferred to the company's general reserve, leaving a credit balance of £608,451 to go forward to the next account as against £566,139 brought in.

After a lapse of four years the directors of Borax Consolidated, Ltd., have been able to declare the full 6 per cent. dividend on the preferred ordinary capital, and, in addition, the holders of the deferred capital receive a dividend of 2½ per cent. For the twelve months to the end of September last the trading profit plus other income totalled £371,518, which compares very favourably with £281,258 shown in the previous account and is the result of an increased demand for the company's products. Debenture interest and sinking fund took £118,325, and depreciation and taxes, etc., accounted for £60,000, the sum of £214,388 being then carried forward as against £207,934 brought in. The company's reserve total £968,165 and the current assets £616,924, while fixed assets stand at £5,189,849. The paid-up share capital is £2,550,000, comprising £800,000 in the form of 5½ per cent. cumulative preference £10 shares; £600,000 in 6 per cent. preferred ordinary £5 shares; and £1,150,000 in deferred shares of £1 denomination.

## Paint Products

The continued expansion of the home market is reflected in the accounts submitted by the directors of the Indestructible Paint Co., Ltd., the trading profit for 1934 being £7,045 higher at £40,880. To this figure must be added other income totalling £6,767, making £47,656, from which must be deducted £1,531 for exchange loss on a German loan and a further £673 for the trading loss of the French subsidiary, also £1,555 for fees, leaving a net profit of £43,898 which compares with £38,051 realised during the preceding twelve months. The dividend on the ordinary shares has been raised from 15 per cent. to 20 per cent., and, after providing £3,000 for income tax and placing £5,000 to reserve, the carry forward is £3,098 higher at £8,798. The balance sheet shows fixed assets totalling £70,150, and floating assets valued at £183,553.

During 1934 a profit of £317,083 was made by Pinchin, Johnson and Co., Ltd., and after providing £52,000 for income tax the net profit amounted to £265,083, which compares favourably with £207,956 realised during the previous year and represents an increase of 36 per cent. The rate of dividend on the ordinary shares has been increased from 15 per cent. to 17½ per cent., absorbing £220,082, leaving a credit balance of £68,143 to be carried forward, which is an increase of £10,813. The improvement was reflected in all departments of the company's activities, and, in addition to an expansion in the volume and value of home business, considerable progress was made in overseas markets. The fixed assets were valued for balance sheet purposes at £939,071, and the floating assets at £1,614,995.

A good recovery has been effected during the past year by the International Paint and Compositions Co., Ltd., the trading profit being shown in the audited accounts at £166,722, which compares with £146,151 in 1933, and the net profit at £102,435, which compares with £91,209, and with £102,362 realised in 1932. The ordinary dividend has been increased from 9 per cent. to 10 per cent., and the allocation of £20,000 to the company's reserve brings that fund up to £190,000. The development fund received an appropriation of £3,000, and a similar amount was transferred to the staff benefit fund in addition to the premiums debited to profit and loss, and,

after reducing the book value of the investment in the Standard Antifouling Composition and Paint Co., Ltd., by £10,000, there remains a credit of £17,179 to go forward to the 1935 account as against the sum of £16,194 brought in from 1933. The company's balance sheet exhibits a sound financial position, cash and British Government securities aggregating £280,140.

The strengthening of the finances of Jenson and Nicholson, Ltd., is seen in the company's trading account which discloses a gross profit of £55,859 for the past year as compared with £46,058 in 1933. At £39,035 the balance of net profit registers an advance of £10,072 in relation to the previous year's net figure, and after reserving £10,714 for income tax the net result was £28,321, of which the dividends on the 6 per cent. pre-preference and the 6½ per cent. preference shares absorbed £19,075. The preference dividend reserve was increased by £2,051, and after placing £3,000 to the general reserve and £2,000 to reserve for investments in subsidiaries the balance of £12,003 was carried forward to the current year, against £808 a year ago. The company's balance sheet shows fixed assets for £284,641 and current assets totalling £223,452.

## Insecticides and Soaps

The final figures of Cooper, McDougall and Robertson, Ltd.—manufacturers of insecticides, sheep dips, etc.—were made up to the end of September last, revealing a trading profit of £142,457 for the year, to which was added £10,000 transferred from the exchange reserve. Profit on investments brought in a further £3,216, and after debiting £3,778 for tax and £11,931 as the contribution to the pensions funds the net profit proved to be £139,964, which represents an increase of £22,042 in relation to 1932-33. The dividend on the ordinary shares has consequently been raised from 5 per cent. to 7½ per cent., while the general reserve receives another £25,000, leaving the carry forward slightly higher at £51,257. The reserves now aggregate £255,000 and the current assets £814,347.

Having regard to the weight increase in the company's toilet tablet without price adjustment, and the improved methods of packing, the trading profit of £40,638 made by Wright, Layman and Umney, Ltd., during the past year must be regarded as very satisfactory. The balance was arrived at after providing for depreciation and was increased by £2,467, representing profit realised on the sale of investments. At £38,477 the margin of net profit was £1,772 better than in the previous year and, although the dividend on the ordinary shares was restricted to 10 per cent., the sum of £10,000 was allocated to reserve and £2,500 to the special contingency fund. Stocks, book debts, and cash totalled £144,132 at the date of the balance sheet, and the general reserve now amounts to £37,500. Goodwill and trade marks stand at £225,577.

## Artificial Silk

After making adequate provision for depreciation of wasting assets, the report of Courtaulds, Ltd., revealed a trading profit of £4,747,986. Income tax and excise duty amounted to £2,593,602, and the net profit balance of £2,217,790 compares with £2,552,051 for the preceding year, when £500,000 profit was made on exchange. The rate of dividend on the ordinary shares has been raised from 6 per cent. to 7½ per cent. and the carry forward has been increased from £251,438 to £269,228. The assets aggregate no less than £47,454,399, comprising property, investments in subsidiary and industrial companies, stocks and stores, book debts, investments and cash. The company has a large number of orders on hand, and further important extensions are being arranged.

The figures submitted by Hadfields, Ltd., indicate a decided improvement in the position and outlook, the trading profit for the past year amounting to £139,942, which represents an increase of £49,085. During 1934 a trading profit of £498,908 was realised by the English Steel Corporation, Ltd., and after charging debenture interest, sinking fund, depreciation and £46,363 for works dismantled and reconstructed there was a balance of £258,893, from which must be deducted the debit of £241,773 brought forward, leaving a credit balance of £17,120 on profit and loss account.

# United States Chemical Trade Conditions

## Effect of 1933 Slump

THAT the chemical industry suffered somewhat less than the average trade from the general recession in business volumes during the summer of 1934 is emphasised in a report on economic and trade conditions in the United States published recently by the Department of Overseas Trade (H.M. Stationery Office, 5s.). A reduced demand for chemicals in the steel, automobile, glass and soap trades, for example, was offset in part by fairly well maintained sales to the textile, oil refining, paper and building supplies industries. The outlook in many branches of the industry may be considered as not unpromising. Carbon black sales during 1934 have been below consumption volume owing to heavy advance buying at the end of 1933 in anticipation of higher prices, and indications are that consumer stocks have been materially reduced. Industrial alcohols have maintained a satisfactory position and deliveries for the year 1934 may be 25 per cent. larger than the indicated sales of 60 million to 70 million gallons in 1933. As regards fertilisers, aggregate sales tonnage should show a marked improvement in the spring of 1935 in view of the increase in farm incomes. The industry has, according to the National Fertilizer Association, benefited under its code of fair competition as a result of elimination of secret rebates and other concessions. Producers' losses on sales in 1933 averaged \$1.04 per ton, but in 1934, despite an average increase in costs of 23 per cent., producers have reported an average net profit of 94 cents per ton. In the alkali branch three new plants in the south with an aggregate annual capacity of 350,000 to 400,000 tons are nearing completion, and expanding demand for alkalies promises soon to engage the greater part of the enlarged producing capacity.

### Progress of the Rayon Industry

The rayon industry continues to improve its position in relation to cotton and silk and at the end of September, 1934, spinning activity had risen to between 80 and 90 per cent. of capacity. Profitable operation has been made difficult by the low price of silk and by Japanese competition on export markets. There has been a considerable increase in the production of yarns of medium weights, 125 to 150 denier. The future of the industry from the financial standpoint is considered to be somewhat brighter at the end of 1934 than has been the case at the close of any recent year. The ability of rayon producers to maintain a stabilised price level is one of the outstanding achievements in the industry. Its value is reflected in the relatively strong financial condition of not only the producers of rayon themselves, but also in the satisfactory financial condition of important weavers and converters. Co-operation in the direction of control of production and promotive plans for the industry as a whole have been other important stabilising factors.

Production census returns show that iron and steel products made in 1933 reached a total value of \$1,141 millions as compared with \$1,400 millions reported for 1931, the last preceding census year, or a decrease of 18.5 per cent. The total production of unrolled steel in 1933 amounted to 23,159,740 gross tons, a decrease of 10.6 per cent. from the 1931 total of 25,895,640. The output for sale and inter-plant transfer of finished rolled and forged products of steel works and rolling mills in 1933 amounted to 11,166,226 tons compared with 13,197,610 tons in 1931. The value of further-manufactured iron and steel products made in departments of steel works and rolling mills from finished rolling-mill and foundry products amounted to \$460 millions. The more important of these were tin plate andterne plate, wire and wire products, wrought pipe and tubes, bolts and nuts, galvanised plates and sheets, corrugated sheets, horse-shoes, railroad spikes, cold-rolled strip steel and cold-drawn steel.

### Control of Oil Production

Control of production of crude oil by the oil-producing States, which was instituted towards the end of 1931, suffered a partial collapse in the first half of 1933 as a result of Court actions taken by individual producers in Texas. The output in that State rose sharply during the spring and early summer and the production of the entire country rose from a daily average of 2,161 thousand barrels in January, 1933,

to 2,699 thousand barrels six months later. This rise in production was followed by a drop in prices which had been none too strong. Such was the position when the President approved the National Industrial Recovery Act on June 16, 1933, which devoted a special section to the petroleum industry, giving to the President authority to prohibit the transportation in inter-state and foreign commerce of petroleum produced in excess of the amount permitted by any State, thus marking the first step towards Federal control of production. On August 19, 1933, a code of fair competition for the petroleum industry under the National Industrial Recovery Act was approved. This was viewed as one of the most constructive developments affecting the industry in recent years. It contained provisions by which the required production of crude petroleum for the whole country, to balance the consumers' demand, was to be estimated by a Federal agency (the Petroleum Administrative Board) and allocated to the various States. It also contained a noteworthy provision under which the President was empowered to fix minimum prices. This price-fixing provision has, however, never been put into effect. A daily production quota for the country of 2,409,700 barrels was eventually established in September, 1933, allotments being made to the several oil-producing States. This has, since that date, been revised from time to time, and, in September, 1934, stood at 2,341,700 barrels daily. On the whole, production has been held fairly well within the limits of the total allowable.

### Copper Industry Statistics

The United States Bureau of Mines has issued an advance summary of statistics of the copper industry for 1933 which shows, in comparison with the statistics for 1932, an increase of 11 per cent. in refined primary output, a 30 per cent. decrease in imports of unmanufactured copper, and a 93 per cent. decrease in imports of the refined metal (largely due to tariff restrictions). Domestic consumption rose by 28 per cent., while exports remained relatively the same, leaving a stock in hand at the end of the year of 851,000,000 lb., about 15 per cent. less than the 1932 stock. Efforts of the industry to formulate a code of fair competition under the National Industrial Recovery Act which would embody a workable plan whereby the problems of excessive stocks, low consumption and depressed price structure might be solved resulted in the submission for approval by the Administrator for Industrial Recovery of a proposed code which contained an article embodying mainly the permissive rights of members of the industry to enter into agreements concerning production and sales at a later date. In approving the code on behalf of the President the Administrator wrote into it a new article embodying a concrete plan which was accepted by the industry. This plan aims at setting up a system of quotas covering sales by primary producers (maximum 20,500 tons per month) and by secondary producers (9,500 tons per month).

### "Freezing" Excessive Stocks

Where current sales exceed current quotas, sales quotas may be drawn upon for two months in advance, and thereafter excess sales are to be made from existing stocks. All copper sold under the quota system is to be known as "Blue Eagle" copper and this metal only may be used in the manufacture of articles for sale to the United States Government. So far as the domestic market is concerned, therefore, the plan seeks to stimulate the sale of newly produced metal and to "freeze" the present excessive stocks.

Under normal conditions the rubber manufacturing industry accounts for about 4 per cent. of the manufacturing activity of the country in non-durable goods. The most important division by far is that of automobile tyre and tube manufacturing, followed by mechanical rubber goods. Excess of production of tyres over sales early in 1934 increased stocks to well over 11 millions, but by the end of August a decline in output had reduced this number to just over 8 millions. Since that month, stocks have continued to decline. It is expected that sales for the full year will reach about 46,700,000 units. The market has been improved by the establishment of

minimum prices under the retail tyre code, but competition has continued to unsettle the price structure. A general upward revision of prices was made effective in October.

New processes registered during the last year include a special non-poisonous industrial fumigant for the destruction of all forms of insect life in raw material and manufactured products; a building stone made from shell or slate; a new general anæsthetic seven times as potent as ether and two and a half times as safe; a pine oil compound for cleaning; a cleansing material effective in salt water as well as in fresh and the experimental use of copper instead of tin in plating steel sheets for manufacture of oil containers. New developments of an agricultural rather than an industrial nature, but which may have important industrial effects, are the extension of tung oil plantations in Florida, plans for the

utilisation of young pines in the Carolinas to provide pulp for the newsprint industry, and the furtherance of soya bean growing in the Middle West. It is also announced that a new and revolutionary chemical process has made possible the production from the abundant and cheap slash pine of the south of sulphite wood pulp which will yield rayon and new substitute textile fibres. Rayon manufacturers have reported that the processing of the pulp was quite successful, spinning satisfactory and the colour of the yarn about equal to that obtained in standard qualities of rayon pulp. As in 1933 the United States imported 643,003 tons of unbleached and 400,633 tons of bleached sulphite wood pulp, and as it is estimated that the pulp from the southern pines can be produced at half the cost, the new development is considered to be of extreme importance.

## Empire Production of Tung Oil

### Dr. L. A. Jordan's Lecture to the Royal Society of Arts

THE Empire production of tung oil was described by Dr. L. A. Jordan at a meeting of the Dominions and Colonies Section of the Royal Society of Arts, held in London, on February 26, at which Sir Arthur W. Hill presided.

Dr. Jordan explained that tung oil never was a substitute for linseed oil in the sense that it could be processed by the established methods of processing linseed oil in varnish manufacture; nor were the products ever the same in their properties. In many respects tung oil was unique among the commercial drying oils available, there being varnishes in regular demand to-day in which tung oil alone could fulfil the requirements. The stimulation of interest in the use of tung oil during post-war years was very valuable and led to its use in conjunction with synthetic resins, and in the great development of nitrocellulose lacquer as a finishing material. The quick-drying and other desirable qualities of these films stimulated interest in oil varnish technique and this time the conjunction of a variety of synthetic resins with tung oil provided the answer to an ever-increasing problem.

In 1927, the Research Association was formed, it being obvious that one of the first tasks must be a proper survey of the tung oil problem from the standpoint of British requirements. The report presented in September, 1927, stated that a scheme for supplying British needs of tung oil by the cultivation of trees within the Empire was not only desirable but that the matter was urgent. During the winter 1927-1928 the first distribution of seeds was made and by 1933 it was evident that tung oil plantations of the species *A. montana* could be grown in the British Empire, results in Assam and New Zealand being particularly promising.

#### Extraction of the Oil

The first step in the extraction of the oil is the de-husking or hulling of the whole fruit. In China, fermentation is allowed to bring away the husks, but this procedure is not to be commended, for the development of enzyme action during storage of the seed under moist conditions leads to high acidity and a general degeneration of quality. If the oil is to be expressed on the plantations, the de-husking and decortication can be carried out as one process. If the decortication is to be a separate process, machinery must be supplied which hammers the nuts just hard enough to break the shells and leave the kernels in a form ready for oil expression. The expression of the oil from the seed proved more difficult. It was first attempted in a hydraulic cage-type press, and although all the artifices of the trade were tried, such as heating and drying the seed, varying the degree of fineness of the meal before pressing, double pressing and so on, it was found that the proportion of oil remaining in the cake remained at an alarmingly high figure. This was caused by the readiness of oxidation of tung oil in comparison with linseed and other common drying oils, and it was found necessary to rupture the seed while actually under pressure. By this method of working the oil can be kept in its unoxidised condition right up to the actual moment when it flows away to the storage tank. The colour of the filtered oil is satisfactorily pale, and its chemical and physical characteristics show it to be in all ways a high-grade oil such as

would be acceptable to the British market to-day. Attention has also been paid to the methods of solvent extraction of tung oil, the attraction being the high yield of oil obtained.

Dr. Jordan concluded by saying that it was now definitely established that authentic samples of *A. montana* oil show in comparison with *A. Fordii* oil a lower content of elæostearic glyceride, which is the principal polymerising component of both types of oil. The result is that *A. Fordii* oil can be adulterated with small proportions, 5 per cent. or so, of cheaper oils, such as soya bean oil, and still respond satisfactorily to tests which demand pure *A. montana* oil; no doubt the commercial community will not be slow to turn this knowledge to account. Even so, if *A. montana* oil is sold at a small discount compared with *A. Fordii* oil, it may still play its part in the Empire development scheme.

In a discussion after the paper a speaker asked if there were any commercial difference between Hankow and Hong Kong wood oil, as imported. Dr. Jordan replied that the names "Hankow" and "Hong Kong" were old designations for two supposedly different types of wood oil. In the north of China the *A. Fordii* tree was grown mostly, and in the south the *A. montana*.

## Insecticides in Argentina

### Register to be Prepared

THE Commercial Counsellor to the British Embassy at Buenos Aires reports that in accordance with a decree dated November 9, 1934, the Argentine Government has decided to open a register for insecticides, fungicides and other products employed for combating insects which damage the crops. In future the Ministry of Agriculture will not authorise the sale of such products unless their formulæ and physical characteristics and efficacy have been previously verified by the respective technical department. The products in question, when packed, must bear an inscription showing the official authorisation and the formula or chemical composition in a visible place.

Authorisation to sell this class of goods will be recommended by a special technical committee. It will be of a temporary nature in the first instance, being valid for a maximum period of two years, when definite authorisation may be granted. The Ministry will ensure that the approved products are sold according to the legal regulations and will take samples for analysis. The sale of unauthorised insecticides, fungicides and other such articles in the whole Republic is prohibited. Specimens of secret composition are not allowed to be sold. Any infraction will be penalised with fines ranging from one hundred to one thousand pesos paper, which would be doubled in the case of a second offence. The decree allows representatives of foreign products 90 days and local firms 60 days in which to apply for authorisation to sell the goods mentioned, counting from the date of publication of the decree. A copy of the decree, in Spanish, may be consulted at the Department of Overseas Trade (Tariff Section).



# The Textile Institute

## This Year's Silver Jubilee Celebrations

FOUNDED in 1910, the Textile Institute, the headquarters of which are at Manchester, celebrates its Silver Jubilee this year. The annual conference of the Institute, which is to take place in the latter part of Whit-week at Ilkley, will form the occasion of celebration—a Jubilee Conference. Many foundation members will doubtless attend and the number will include several members in office to-day. For instance, the annual Mather Lecture will be appropriately contributed by Mr. J. H. Lester, M.Sc., a foundation member and Fellow who was responsible more than any other individual for the promotion of the organisation and the framing of the objects. The names of approximately fifty existing members appear in the list of foundation members. Although from the outset a scheme of qualification of members was held definitely in view, it was not until 1922 that a successful movement in this direction was begun. It was fortunate, perhaps, that the movement should have been delayed. The membership strength and the financial resources of the organisation had been greatly improved as a result of generous efforts on the part of the late Sir William Mather and the late Sir Frank Warner.

### The Foundation Fund

The former, as president, launched the Foundation Fund, but it required the driving force which followed on the part of Sir Frank Warner, the late Sir Wm. Priestley, the late Alderman W. Frost, Mr. George Garnett, and others, to establish the fund upon a basis sufficient to yield an adequate revenue to support plans of development of the Institute's activities. At the present time, approximately £20,000 has been contributed to the Foundation Fund and the annual income from investments is devoted to particular objects. Three special Institute awards have been established—the annual Mather Lecture, the Institute Medal (in recognition of distinguished services to the textile industry and particularly to the Institute and its work), and the Warner Memorial Medal (awarded in respect of original investigation in textile technology published in the Journal of the Institute). Probably the highest distinction is conferred at appropriate intervals in the form of the honorary Fellowship of the Institute. The first awards were made in 1928—to Mr. C. F. Cross, F.R.S., inventor in relation to the viscose process of rayon, and to Mr. Horace Lowe (since deceased), inventor in relation to mercerisation of cotton. Only two others have been since conferred—to Mr. J. W. Nasmith, inventor of the Nasmith comb, and Mr. C. F. Topham, inventor of the centrifugal spinning-box for viscose rayon.

### Scholarship Scheme

The revenue from certain portions of the Foundation Fund is annually devoted to special purposes in accordance with the desires of contributors. The annual income from a contribution of £2,000 by Mr. John Crompton, in memory of his son who lost his life in the Great War, is applied to the provision of prizes in an annual competition in relation to design and structure of woven fabrics. In another instance, the annual income is devoted to a scholarship scheme. The scholarship is awarded at intervals, according to circumstances, and is of exceptionally attractive character in the field of technical training for industry. A fund of £5,500, contributed by the Cotton Reconstruction Board and the Trustees of the Cotton Trade War Memorial Fund, is invested and the annual interest is devoted to scholarship maintenance.

The scholarship is offered to young craftsmen engaged in either cotton spinning or cotton weaving in this country. Application is limited to craftsmen under 24 years of age, who have already secured the full technological certificate of the City and Guilds of London Institute. The scheme provides for two years of extended training at a technical college and one year of industrial experience abroad or at home according to circumstances. Two scholarships have already been completed and the services of the holders have been favourably absorbed by the industry. The next scholarship will become operative in October of the present year.

It was during the first year of the presidency of Mr. John

Emsley, J.P., of Bradford—1922—that steps were taken to secure a Royal Charter. Mr. Emsley, determined to promote a movement of permanent value to the organisation, readily accepted a suggestion in favour of application for a Charter under which the Institute would be authorised to award certificates of competency to the textile technologist and to conduct examinations in relation to such awards. Without the generous financial assistance of Mr. Emsley, the whole plan could not have been seriously contemplated. As president, however, he decided to see the scheme through and remained in office for four years in order to accomplish his purpose, doing excellent service in the meantime in the matter of increasing the membership and improving the whole position of the organisation.

The Royal Charter was secured by the Institute in 1925, and under its provisions the scheme of qualification of members has been steadily developed. The scheme is somewhat distinctive in character inasmuch as provision is not made for certification of competency in connection with admission to membership. Qualification is subsequent to membership, whereas qualification precedes admission to membership of many other professional bodies. Quite recently, the Board of Education has launched a scheme of National Certificates in textiles, and the Textile Institute has been selected as the appropriate professional body for the purpose of co-operation with the Board in the conduct of the scheme.

There is considerable sectional activity on the part of the Institute and five regional sections hold meetings for the delivery of papers or lectures—Lancashire, Yorkshire, London, Midlands, Scottish, and Irish. The annual conference brings these various interests together and at the forthcoming conference at Ilkley, the general subject to be dealt with by contributors of papers will be that of "Conversion of Fibres into Yarns." The indications are that the conference, the proceedings of which will occupy three days—Wednesday to Friday of Whit-week—will be associated with a record attendance.

## Hydrogenation in Scotland

### National Development Council's Investigations

THE importance of a home supply of oil from bituminous coal and shale is stressed in the first report of the Oil from Coal Committee of the Scottish National Development Council published on May 15. The committee outlines the results of its investigations into the methods of obtaining oil from coal by hydrogenation and by carbonisation or destructive distillation.

Hydrogenation is stated to be technically capable of satisfying the country's demand for oil products, except lubricating oil; but the report indicates that further research may show how the latter may also be derived from coal. The considerations of low-temperature carbonisation have been analysed by the committee; even if practised on a large scale this process would be insufficient to meet the demand for oil.

Smokeless fuel, the committee believes, will have to find a footing in a free market in competition with house coal, and will have to possess both the quality and price to appeal to the purchaser.

The nature of the recommendations in the report indicates the committee's desire to promote inquiries facilitating the selection of suitable Scottish coals for low-temperature carbonisation and for hydrogenation. The Duke of Montrose urges Government aid to establish low-temperature carbonisation, while Mr. William Adamson contends that processes for the production of oil from coal should be nurtured and controlled by the nation.

Councillor W. Brownhill Smith, Glasgow, in a supplementary statement, gives information regarding the benefits of carbonising all coal required to yield heat for domestic purposes. He believes that if carbonisation were carried out far more than 40,000,000 tons of coal would require to be treated, and that there would be a great increase in the demand for gas because of the low price at which it could be produced and distributed.

## New Technical Books

**MEANS FOR PROTECTING BUILDINGS (Bautenschutzmittel),** By Dr. C. R. Platzmann. Berlin: Chemisches Laboratorium für Tonindustrie und Tonindustrie-Zeitung Prof. Dr. H. Seger und E. Cramer, G.m.b.H.

The increasing decay of numerous of these irreplaceable buildings through the atmosphere, which is becoming more acid in consequence of industrial development, has created during the last 10 to 20 years, under the slogan "More knowledge about building materials," the development of protective measures about which there are numerous publications. Dr. Platzmann has undertaken to collect this very extensive literature, to examine it closely, to classify it and to give those interested a survey. The author has succeeded in his task, and has divided the book into four parts: (1) Means for protecting buildings; (2) the working up of these protective materials; (3) tests for these protective materials; (4) alphabetical index of protective materials arranged according to their composition. Dr. Platzmann confines himself in the way described in "Means for protecting buildings," without mentioning that the ceramic materials, blue brick and terra-cotta possess the acid and weather resistance which "protective measures" cause to seem needless.

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**THE DIFFRACTION OF X-RAYS AND ELECTRONS BY AMORPHOUS SOLIDS, LIQUIDS AND GASES.** By J. T. Randall, M.Sc. pp. 302. Chapman and Hall, Ltd. 21s. net.

For the purposes of structural investigations the various forms of matter may conveniently be divided into four classes, namely, crystalline solids, amorphous solids, liquids and gases. Following on the work of W. L. Bragg in the years 1912 and 1913, knowledge of the arrangements of atoms and molecules in the crystalline state has increased continually at a very rapid rate. The first investigations on the diffraction of X-rays by amorphous solids and liquids were published by Debye and Scherrer in 1916, but it is only comparatively recently that anything like a proper understanding of the results has been obtained. The theories which have been proposed to explain the experimental results are all ultimately concerned with the degree of structure in the substances, and the working out of the ideas has depended to a large extent on the results of X-ray crystallography. Between the truly crystalline solid and the amorphous solid there exists a vast region of microcrystalline substances of great chemical and biological importance; of these, carbon blacks, cellulose, stretched rubber and the proteins may be mentioned. In addition, there are the substances which may be microcrystalline in one direction only. The method of electron diffraction is ideally suited to the investigation of structure in such cases as these; the same method, as well as that of X-ray diffraction, may be used to study the structure of single gaseous molecules. Neither the experimental technique nor the theoretical interpretation of results has yet reached the stage of logical completeness we find in the work on normal crystalline things. Nevertheless, the large amount of work that has been done and the importance of the results obtained from the points of view of structural physics and chemistry has led the author of this book to believe that there was a need for some work which would try to draw together the various strands of this new knowledge.

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**TECHNICAL ASPECTS OF EMULSIONS.** pp. 150. A Harvey.

This volume consists of papers read at a symposium held in London, December 7, 1934, under the auspices of the British Section of the International Society of Leather Trades' Chemists and includes a foreword by Professor F. G. Donnan. The great importance of emulsions in many industries and technical processes requires no emphasis, and readers of this book will learn much concerning the application of the science of emulsions and emulsification to many industries, leather, wool, agriculture, food, rubber, paint, varnish and road making. Emulsions also play a most important part in physiology, medicine and pharmacy, an aspect that is often forgotten. There are 12 sections in the book, including "The mechanism of emulsification," by Professor H. Freundlich, "The use of highly-dispersed emulsions in the treatment of Toxic conditions," by V. G. Walsh, "Emulsions in the Patent literature," by W. Clayton, "The design of emulsifying machines," by R. I. Johnson, "Effect of the mode

of preparation on the dispersion of soap-stabilised emulsions," by R. Dorey, "Problems connected with the preparation and application of emulsions used in agricultural spraying," by R. M. Woodman, "Some observations on a typical food emulsion," by J. W. Corran, "Emulsions and emulsification in the wool textile industry," by J. B. Speakman, "The stability of emulsions in thin films," by L. A. Jordan, "Emulsions in the leather industry," by W. R. Atkin, "Rubber latex," by H. P. Stevens, and "Some physical properties of dispersions of asphaltic bitumen," by L. G. Gabriel.

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**REMSEN'S INTRODUCTION TO THE STUDY OF CHEMISTRY (Remsen's Einleitung in das Studium der Chemie).** By Prof. Dr. Hans Reihlen. Leipzig: Theodor Steinkopf.

With a very interesting argument, Prof. Reihlen introduces the 9th entirely newly elaborated edition of the "Introduction to the Study of Chemistry." He states that translations and adaptations of American text-books have enjoyed a large circulation in Germany for some time for beginners in chemistry, whilst, on the other hand, some of the German text-books are used all over the world for advanced students. The reason of this remarkable phenomenon is stated as follows: "The best German text-books for chemistry start with the material, the best American with the reader." Nevertheless, this edition is no longer a translation of an American text-book, but an independent development of a recognised chemical text-book. The previous book, in many parts out of date, has been considerably altered in the new adaptation. The broad style has been retained, as well as the detailed treatment of the chemical mathematical examples, and the emphasis of what is of technical importance. Definite instructions have been included for the drawing-up of equations of reactions and structural formulae, as well as the derivation of the law of mass action. A short chapter has also been inserted on isomorphism and on colloids. The author states that war materials and explosives are dealt with in more detail than was previously the case. The book is modernised in an interesting way.

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**CRYSTAL CHEMISTRY.** By Dr. O. Hassel. Vol. XXXIII of Scientific Investigation Reports, Natural Science Series, edited by Dr. Raphael Ed. Liesegang, Frankfurt a/M. (Kristallchemie, Band XXXIII der von Dr. Raphael Ed. Liesegang, Frankfurt a/M. herausgegebenen naturwissenschaftlichen Reihe der Wissenschaftlichen Forschungsberichte.) Leipzig: Theodor Steinkopf.

This natural science series of scientific investigation aims at offering in a concise form most of the important publications since 1914 in the various fields of modern natural science research in various languages. The aim of crystallography of the nineteenth century was to explain the lawful connections between crystal structure and chemical constitution. The great significance of this problem has attracted the interest of many of the most eminent chemists and crystallographers of this epoch towards this field between chemistry and crystallography. Therefore there existed at the turn of the century considerable knowledge of the crystal structure of the most varied chemical compounds. Nevertheless, such far-reaching understanding had not then been attained that "crystal chemistry" could be spoken of at that time. It was simply because the means of experiment did not exist which reveal to us the inner structure of the crystals. First, the discovery of Röntgen interference by M. v. Laue, and the first pioneering investigations of crystal structure by W. H. and W. L. Bragg opened up the possibility of bringing before the world the inner architecture of crystals. Through the overwhelmingly large material in more or less thoroughly examined crystal structures, through the Röntgen-crystallographical work of V. M. Goldschmidt and Bragg, as well as the work of the crystallographer, L. Pauling, of Stockholm, the fundamental principles of a general nature have been discovered. Hereby it was made possible to thoroughly elucidate the constitution of certain classes of substances. A crystal-chemical science can therefore be spoken of with every right to-day. Hassel's work is devoted to this new field of investigation. He has furthered a study which has had an increasing importance for decades and will doubtless attain a still greater significance.

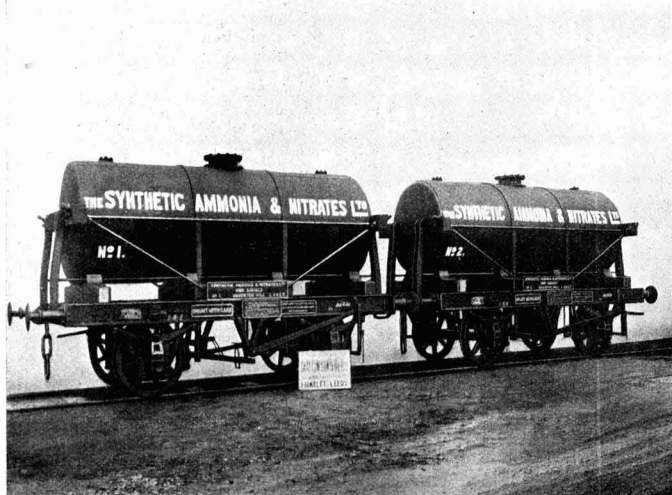
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## Letters to the Editor

### Sixth International Congress for Scientific Management

SIR,—On July 15 the Sixth International Congress for Scientific Management is to be opened by its patron, the Prince of Wales, in the Central Hall, Westminster. We are grateful for the magnificent support which has been given in particular by H.M. Government and the Federation of British Industries and also the valuable aid and financial assistance from so many professional, scientific and trade organisations and private individuals, all of whom are co-operating wholeheartedly to make this conference worthy of remembrance as one of the great events of Jubilee year.

For four days a series of conferences will provide a channel for expert discussion on the problems of practical management in relation to industrial, commercial, agricultural and domestic matters. Parallel with these technical conferences a very comprehensive hospitality programme has been arranged. To conclude the congress, visits of factory inspection covering representative types are available to members. Special tours have been planned for the particular benefit of foreign members so that they will see excellent examples of industrial and commercial organisation.

The papers for discussion at the congress, amounting to two hundred in all, are now available. They emanate from various countries and provide a most interesting field of discussion for those engaged in managerial capacities either as directors or executives. Never before has there been available in this country such a body of experience or so good an opportunity of establishing fruitful personal contact with those practically engaged in the solution of these vital problems at home and abroad; never before has there been such an opportunity to show to the rest of the world the progress which our country has made in the efficient management of its multifarious activities. At the Paris Congress there were two thousand members and we feel that Britain should not be content with a less number, but it should be exceeded in view of Britain's pre-eminent position as an industrial and commercial nation.

We are convinced that the full utilisation of these opportunities will be of the greatest benefit to the nation as a whole, and therefore draw the attention of the management of all undertakings, whether large or small, to this occasion.—Yours faithfully,

A. S. ANDERSON, E. F. ARMSTRONG, J. J. ASTOR, BARNBY, WOODMAN BURBRIDGE, G. C. CLAYTON, GEORGE L. COURTHOPE, WINIFRED C. CULLIS, HY. FOWLER, GEORGE R. FREEMAN, J. GEORGE BEHARRELL (Chairman), R. A. HADFIELD, HIRST, M. WEBSTER JENKINSON, KENNETH LEE, JAMES LITHGOW, GUY LOCOCK, D. MILNE-WATSON, A. H. POLLEN, W. PRESCOTT, B. SEEBOHM ROWNTREE.

21 Tothill Street, S.W.1.

## Air Force on British Petrol

### Our Own Coal can Supply 114,000,000 Gallons

IN view of the proposal to treble the strength of the Royal Air Force, particular interest has been aroused by an estimate put before the annual general meeting of the Scottish Branch of the National Smoke Abatement Society at Stirling on May 24, when it was stated by Colonel W. A. Bristow, chairman of Low Temperature Carbonisation, Ltd., that all Service requirements of petrol could be supplied by British coal.

"I think it not unreasonable to expect," he said, "that, within a relatively short period, low temperature smokeless fuel may provide 10 per cent. of our domestic requirements. To replace this four million tons of raw coal, about six million tons would have to be supplied to the carbonising plants. From this, there would be produced about 96 million gallons of crude oil and 18 million gallons of crude spirit suitable for the production of aviation spirit for use by the Royal Air Force.

"If petrol were wanted, the whole of the 96 million gallons of the crude oil could, by hydrogenation, be converted into 96 million gallons of petrol, which, added to the 18 million gallons produced from the gas, would give a total of 114 million gallons of petrol."

## Lawn Tennis Tournament

### 1933 Cup Winner Beaten

MONDAY week, June 10, is the closing date for the first round matches in the fifth annual CHEMICAL AGE Lawn Tennis Tournament, and competitors who have not already played off their matches are reminded that the results must reach THE CHEMICAL AGE not later than first post on June 11. Nine matches in the singles have been played to date, the most noteworthy result being the defeat of C. G. Copp (Doulton and Co., Ltd.), winner of the singles cup in 1933, by A. S. Marcar (Bovril, Ltd.) by 6-4, 6-3. A. Baxter (United Yeast Co., Ltd.), who won the singles cup last year, has survived the preliminary round by beating V. D. Thompson (Stafford Allen and Sons, Ltd.) 6-0, 6-4. J. Haines (Anglo-Persian Oil Co., Ltd.), joint holder with F. G. Hawley of the doubles cup, has beaten R. J. Sleaf (United Yeast Co., Ltd.) 6-0, 6-3 in the singles. His doubles partner, Hawley, who is drawn against H. R. Whittaker (Williams, Hounslow, Ltd.) in the singles, had not played his match at the time of going to Press. No results in the doubles have yet reached us.

## China Clay Producers

### Effort to Form Association Fails

OWING to the refusal of two firms to co-operate the proposed Cornwall and Devon China Clay Producers' Association has failed to materialise. This was the negative result of an important meeting of producers which took place at St. Austell on May 22, and over which Major Hilgrove McCormick, secretary to the Duchy of Cornwall, presided as independent chairman.

The CHAIRMAN said that if they formed an association they would be following the example of most other industries, and they had a basic advantage for their industry was in what they might call a ringed fence. If they formed an association he suggested that they should not be too critical at the outset. The success of an association depended upon wholehearted co-operation and the keeping of rules. There were pros and cons to be considered, and among the pros was the advantage of being able to regulate their supplies according to demand. From the figures he had available it appeared that their trade had gone down since their old association was disbanded, but it was a hopeful sign that gradually their markets were again increasing. As china clay producers they had two serious responsibilities—to maintain their markets in order that they could employ the maximum number of men, and not to overcharge their customers. Their first-grade clays would sell themselves, but to regain success they would have to watch their overheads and find additional markets for their medium and common clays. A producers' association might also have advantages in other directions, including that of collective publicity.

### Producers Who 'Broke Their Pledge'

Mr. WALTER H. GRAHAM, who had been acting as secretary *pro tem* to the movement, said that following the first meeting of producers about two months before, when they expressed themselves in favour of the formation of an association, the executive committee had been working to secure the necessary official support of ninety-five per cent. of tonnage turnover. He regretted to report, however, that they had not been successful in securing that percentage, in consequence of two firms intimating that they were unable to co-operate in the proposed scheme for the regulation of quotas and prices according to the market. The largest and also the smallest firms in the industry had intimated their willingness to co-operate, but while the two firms mentioned remained in the minority they were in a position to make it impossible for the proposed association to function.

In these circumstances a suggested resolution to bring an association into being was not voted upon, the meeting being adjourned *sine die*. It was reported that one or two producers who had undertaken not to enter into contracts for 1936 while negotiations for the formation of the proposed association were pending had broken their pledge and done so, to the disadvantage of other producers who had adhered honourably to the understanding, and resentment was expressed at these breaches of the undertaking.

## Institute of Chemistry

### April-May Examinations

THE Institute of Chemistry has issued its pass list in connection with the April-May examinations as follows:

Examination in General Chemistry for the Associateship: F. Baldry, Central Technical College, Birmingham; R. O. Blench, Rutherford Technical College, Newcastle-upon-Tyne; R. W. van den Bosch, Regent Street Polytechnic, London; A. J. Caveney, Central Technical School, Liverpool; J. A. Emlyn, Central Technical School, Liverpool; K. C. Etches, University College and The Technical College, Hull; H. S. Hughes, Chelsea Polytechnic and Battersea Polytechnic, London; T. E. Johnson, A.M.C.T., College of Technology, Manchester; R. L. Kenny, B.Sc. (Lond.), Chelsea Polytechnic, London; W. F. Maber, B.Sc. (Lond.), trained under Thomas Stenhouse, B.Sc., F.I.C.; T. L. Parkinson, B.Sc. (Lond.), University College, London; L. Pearson, Central Technical College, Birmingham; G. Perkins, Sir John Cass Technical Institute, London; W. R. Powers, Central Technical School, Liverpool; E. C. Robertson, B.Sc. (Lond.), Regent Street Polytechnic, London; R. S. Wells, B.A. (Cantab.), Cambridge University; Miss W. E. Welton, B.Sc. (Lond.), Chelsea Polytechnic and Birkbeck College, London; H. White, A.M.C.T., College of Technology, Manchester; R. A. Williams, Wigan and District Mining and Technical College.

Examinations for the Fellowship: In Branch A: Inorganic Chemistry, with special reference to the Metallurgy of Iron and Steel: R. C. F. Stephens. In Branch D: Biochemistry, with special reference to Physiological Chemistry: E. M. Bavin, B.Sc. (Lond.). In Branch E: The Chemistry, including Microscopy, of Food and Drugs, and of Water: J. H. Barker, B.Sc. (Lond.), V. C. Branson, B.Sc. (Lond.), A.R.C.S., D.I.C., C. Edwards, B.Sc. (Lond.), J. A. Freeman, B.Sc. B.Pharm. (Lond.), G. F. Hall, M.B.E., B.Sc. (Lond.), W. M. Keightley, H. K. Lawton, Ph.D. (Liv.), C. A. Macdonald, B.Sc. (Lond.), R. K. Matthews, H. R. Nanji, B.Sc. (Bombay), Ph.D. (Lond.), D.I.C., A. Smith, B.Sc. (Lond.), S. G. E. Stevens, B.Sc. (Lond.), J. H. Weber, B.Sc. (Lond.), R. F. Wright, B.Sc. (Lond.), A.R.C.S. In Branch F: Agricultural Chemistry: L. W. L. Cole, M.Sc. (Lond.). In Branch G: Industrial Chemistry, with special reference to Contact Catalysis in Industry: T. P. Dee, B.Sc. (Lond.).

Special Examination in General Analytical Chemistry: R. H. Burns, B.Sc. (Lond.).

## Atmospheric Pollution

### Conference of Local Authorities

THIRTY-SIX representatives of local authorities and other organisations co-operating with the Department of Scientific and Industrial Research in the investigation of atmospheric pollution met on Monday in the half-yearly conference at the offices of the Department. The gathering included representatives from Barnes, Barnsley, Birmingham, Dagenham, Glasgow, Halifax, Lancaster, Leicester, Liverpool, City of London, London County Council, Manchester, Royal Leamington Spa, Salford, Surrey County Council, Westminster, Willesden, Cadbury Brothers and the British Commercial Gas Association.

The conference, over which Councillor W. Brownhill Smith presided, received a report from Dr. G. M. B. Dobson on the progress of the researches carried out under the Atmospheric Pollution Research Committee. Dr. Dobson informed the conference that a full-time investigator had been appointed by the Department as a preliminary to the undertaking of an intensive survey, at a selected centre, of various types of pollution with a larger number of instruments. The method developed at the Building Research Station for estimating sulphur in the atmosphere was now being adopted more widely by the local authorities. Further experiments combined with weather observations were being taken in hand to facilitate the interpretation of the data collected by means of the deposit gauge observations.

The conference laid emphasis upon the assistance which could be given by the local authorities in the conduct of the investigations, and it was agreed that a circular letter be sent to them suggesting particular directions in which this assistance would be most useful.

## New Dyestuffs

### Two New Thionol Browns

Thionol Brown PRS is a new addition to the I.C.I. range of Thionol dyestuffs. It is similar in general properties to the already well-established Thionol Brown PS, but is redder and brighter in shade and approximately equal in strength. Thionol Brown PRS is characterised by very good fastness to washing, acids, alkalis, cross-dyeing and vulcanising, and if the familiar copper-chrome after-treatment is resorted to the fastness of the dyed shade is further improved, particularly so as regards fastness to light. This new dyestuff is suitable for application to all forms of cotton and viscose material and, on account of its good solubility and stability, will be found of particular interest for use in circulating machines for dyeing cops, beam warps, etc. Dyeing is carried out in the normal manner for a period of  $\frac{1}{2}$  to 1 hour at 185-195° F. (85-90° C.) in a dye bath containing 5-20 per cent. Thionol Brown PRS, 10-40 per cent. sodium sulphide crystals, 3-6 per cent. soda ash and 10-30 per cent. common salt. The dyed and thoroughly rinsed material is worked for 20-30 minutes at 180° F. (80° C.) in a fresh bath containing 2-3 per cent. acetic acid (30 per cent.), 1½-2 per cent. copper sulphate and 1½-2 per cent. sodium or potassium bichromate.

Thionol Red Brown 4RS has also been added to the I.C.I. range of Thionol dyestuffs. Thionol Red Brown 4RS is redder and brighter in shade than both Thionol Corinth 2RS and Thionol Red Brown 3RS, and is similar in general fastness properties to these brands. This new dyestuff is suitable for the dyeing of cotton piece, chain warps and all types of yarn, both in the open beck and in circulating machines. It is equally suitable for application to viscose materials. The following particulars illustrate the application of this product: 5-20 per cent. Thionol Red Brown 4RS, 10-40 per cent. sodium sulphide crystals, 3-6 per cent. soda ash, 10-30 per cent. common salt. Dyeing is carried out for a period of  $\frac{1}{2}$  to 1 hour at 175-185° F. (85-90° C.). After subjecting the dyed material to a short period of air oxidation it is advisable, in order to develop the shade, to rinse the dyeings in a cold bath of dilute acetic acid.

### A New Colour for Linoleum

Monolite Violet FRS is an entirely new product introduced by Imperial Chemical Industries, Ltd., for the printing ink, paint and wallpaper trades and the colouring of linoleum. It represents an attractive reddish-violet pigment dyestuff, considerably bluer in shade, as a printing ink colour, than Monolite Bordeaux BLS Powder. Monolite Violet FRS Powder possesses good light fastness and transparency. It is also fast to nitrocellulose solvents and is, therefore, very suitable for the production of maroon-shade cellulose lacquers. It is insoluble in water and requires no laking process to develop the shade. It is simply ground or mixed with the required substratum into the process medium and is ready for use.

### A Fast Acid Wool Blue

Solway Blue PFN has been introduced by Imperial Chemical Industries, Ltd., to meet the demand for an acid wool blue especially fast to light, perspiration and salt water. It is equal in shade to Solway Blue BS and slightly greener than Solway Blue PF. It has all the outstanding properties of Solway Blue PF, together with the added features of slightly superior salt fastness, perspiration fastness and a more desirable change in artificial light, similar to that of Solway Blue BS. It will be appreciated that the latter property enables Solway Blue PFN to be readily substituted for Solway Blue BS in established recipes. Solway Blue PFN is suitable for dyeing all forms of woollen materials and, on account of its very good light fastness and level dyeing properties, is of particular interest for application to piece goods. Because of its very good fastness to salt water, water and light, it is of value for the dyeing of yarns for the bathing costume trade, either as a self colour or in combination with other dyestuffs, and amongst other uses it is suitable for application to natural silk, carpet yarns, knitting yarns and fur and wool felt hat bodies.

UNITED States production of cellulose plastic products (sheets, rods, and tubes) increased in the first quarter of 1935, according to the Bureau of the Census, to 7,184,969 lb. compared with 4,733,440 lb. in the corresponding period of 1934.

## Personal Notes

MR. REGINALD JANSON HANBURY, of Foxbury, Woldingham, Surrey, a director of Allen and Hanburys, Ltd., left £30,333 (net personalty £20,482).

PROFESSOR J. A. S. RITSON has been appointed to the London University Chair of Mining, tenable at the Imperial College, Royal School of Mines, from January 1 next. Since 1923, he has been professor of mining in the University of Leeds.

AT THE LIVERPOOL UNIVERSITY graduation ceremony on May 24, honorary LL.D. degrees were conferred on Mr. Arthur Harden, late director of biochemistry at the Lister Institute, and Dr. Nevill V. Sidgwick, president-elect of the Chemical Society.

MR. SQUIRE TAYLOR, managing director of J. Spencer Ashworth, Ltd., chemical manufacturers, Dumers Lane, Radcliffe, and Mr. T. Saville Whittle, head of the chemical industry firm of T. Saville Whittle (Export), Ltd., and T. Saville Whittle, Manchester, have been enrolled on the commission of Peace for the County Palatine of Lancaster.

MR. P. LARSEN, the chairman of the Tunnel Portland Cement Co., has died. Mr. A. G. Larsen has been elected chairman and Mr. N. M. Jensen appointed managing director.

MR. GEORGE H. COX, formerly chairman of the Salt Union, Ltd., has died at his home, Underfell, Bowness-on-Winder-

mere. He was 87. Mr. Cox, who retired in 1931, spent his business career mainly in Liverpool. He became chairman of the Salt Union, Ltd., in 1908, and was also chairman of the Mersey Power Co., Ltd., and of the Liverpool Chamber of Commerce. He had two sons and a daughter.

SIR WILLIAM POPE, Professor of Chemistry at the University of Cambridge, is to be the guest of honour at an Anglo-French dinner in Paris on June 26. He will attend the banquet to be given by the Association France-Grande Bretagne, of which the Marquis de Vogüé is president.

MR. E. ROSENDAHL, managing director of the Glyco Products Co., Inc., New York, will arrive in London about July 3. Mr. Rosendahl, an Englishman by birth, is a graduate of the University of Manchester and was formerly connected with the research division of the British Dyestuffs Corporation. While in London he will make his headquarters with Rex Campbell and Co., Ltd., 7 Idol Lane, Eastcheap, who are the representatives in the United Kingdom for the Glyco Products Co., Inc.

MR. R. BOULTER, C.M.G., British Trade Commissioner at Wellington, New Zealand, is now in this country on an official visit. He will be available at the offices of the Department of Overseas Trade, June 3-17, for the purpose of interviewing manufacturers and merchants interested in the export of United Kingdom goods to New Zealand.

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## Continental Chemical Notes

### Belgium

IT IS REPORTED FROM BRUSSELS that the Soc. Belge de l'Azote has enlarged its plant to manufacture various organic and inorganic products previously imported.

### Austria

THE KIESELGUHR DEPOSIT recently located between Limberg and Maissau in north-west Austria is to be exploited by the Austrian Ceresit company, Adolph Fischer and Sons, of Vienna.

### Jugoslavia

COMPULSORY ADMIXTURE OF MINERAL OILS with vegetable oils is urged by producers of the latter in a memorial to the government owing to the increased area now under cultivation with soya beans, sunflowers and other oil-yielding plants and the establishment of a domestic oil-expressing industry.

### Russia

SYNTHETIC RUBBER PRODUCTION from alcohol during the first four months of this year amounted to 7,500 tons against only 1,500 tons in the corresponding period of 1934.

THE APATITE MINES at KIROV are now in production, according to Press reports, with an estimated output for this year of 1½ million tons ore. The new flotation plant is also expected to produce 700,000 tons of concentrate in the current year.

### Norway

NEW REGULATIONS governing the incorporation of chemical preservatives and dyestuffs in food products will come into force on July 1. Permissible preservatives in canned foods thereafter will be: Common salt, saltpetre, sugar, alcohol, vinegar, lactic acid, citric acid, tartaric acid and olibanum. In addition, benzoic acid is permissible in so-called semi-preserves (anchovies, caviare, filleted herrings in oil, etc.) in a maximum proportion of 0.5 per cent.; likewise p-hydroxybenzoic acid esters (maximum 0.05 per cent.). Canned vegetables may be coloured with the appropriate copper salt, provided that the product (after separating the liquid) does not contain more than 1 part copper in 10,000 ("Norsk Lovtvedende," No. 17).

### Esthonia

DEEP DRILLING OPERATIONS for petroleum in the Werro district are believed to be impending with participation of German capital.

### Roumania

A SULPHURIC ACID WORKS with a daily output capacity of 6 tons is under construction in Bucharest by the Brothers Goldenburg Ironworks.

### Hungary

THE PETER NITROGENOUS FERTILISER CO. has taken over the State carbon bisulphide factory and will undertake an expansion of the latter's activities. This concern is also understood to have successfully concluded trials of the Vargha process for lignite tar hydrogenation to motor spirit and contemplates the erection of a larger plant.

### Germany

PASSAGE OF A SILENT ELECTRIC DISCHARGE through tetrahydronaphthalene results in formation of a whole series of low-molecular hydrocarbons (butane, propane, etc.), together with hydrogen. When treated in an apparatus similar to that used in the production of voltoids, tetralin also yields a highly viscous oil with a distillation residue suitable as a varnish resin. On the other hand, treatment in a so-called Geissler tube not only produces a viscous oil, but also a crystalline body with double the molecular weight of tetralin ("Metallbörse," May 15).

### France

A SYNTHETIC PETROL PLANT is now being constructed by Soc. Huiles, Goudrons et Dérivés which owns factories near Lens and Metz.

THE SAINT-DENIS DYESTUFFS CONCERN closed 1934 with a net surplus of 8½ million francs (against 9¼ million) and again declares a dividend of 40 francs per share.

NEW PRODUCTS OF THE SAINT GOBAIN CONCERN, at its works in Wasquehal, are sulphur trioxide, sodium bisulphite and sodium metabisulphite. Last year's trading resulted in a net profit (in round figures) of 32 million francs (21 million previously), with a dividend of 35 francs per share (against 25 francs).

# Inventions in the Chemical Industry

## Patent Specifications and Applications

The following information is prepared from the Official Patents Journal. Printed copies of Specifications accepted may be obtained from the Patent Office, 25 Southampton Buildings, London, W.C.2, at 1s. each. The numbers given under "Applications for Patents" are for reference in all correspondence up to the acceptance of the Complete Specification.

### Applications for Patents

(May 9 to 15 inclusive.)

- DIAZOTISING AZO DYESTUFFS, manufacture.—A. Carpmæl. 14146, 14147.
- HIGH MOLECULAR COMPOUNDS, manufacture.—A. Carpmæl. 14148.
- FLUORINE COMPOUNDS, manufacture.—A. Carpmæl. 14266.
- POLYAZO DYESTUFFS, manufacture.—A. Carpmæl. 14271.
- ASYMMETRIC DICHLORETHYLENE, ETC., preparation.—Compagnie de Produits Chimiques et Electro-métallurgiques Alais, Froges, et Camargue. (France, May 26, '34.) 13787.
- LAKE COLOURS, production.—E. I. du Pont de Nemours and Co. (United States, May 11, '34.) 14024.
- FERRIFEROUS ORES, treatment.—Z. Gálocsy and K. Koller. (Hungary, May 12, '34.) 13909.
- NITROGENOUS POLYVINYL DERIVATIVES, manufacture.—W. W. Groves. 13789.
- ACETYL CELLULOSE, dyeing, etc.—W. W. Groves. 13995.
- ELECTRODEPOSITS OF NICKEL-COBALT ALLOYS, production.—A. Hinrichson. 13784.
- AMINO-SUPHONES, manufacture.—J. Y. Johnson. 13808.
- ACETALDEHYDE, manufacture.—J. Y. Johnson. 13809.
- METAL ALLOYS.—Johnson, Matthey and Co., Ltd. 14017.
- CHEMICAL PRODUCTS FOR FERTILISERS, manufacture.—P. Lanthier. (France, April 9.) 13669.
- SEPARATING NON-LUBRICATING HYDROCARBON OILS into their components.—Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij. (July 12, '34.) (Holland, July 15, '33.) 13724.
- ACID AMIDES, preparing.—Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij. (United States, May 14, '34.) 13725.
- XANTHATES, preparation.—Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij. (United States, May 22, '34.) 14269.
- SILICA, purification.—J. A. Newbold. 14231.

HYDROCARBONS from distillable carbonaceous materials, production.—H. E. Potts (International Hydrogenation Patents Co.). 14187.

CELLULOSE ESTERS, ETC., production.—Wolf and Co. Komm.-Ges. (Germany, May 9, '34.) 13734, 13735.

### Complete Specifications Open to Public Inspection

OXYALKYLATED ( $\beta$ ,  $\alpha$ -DIOXYPROPYL)-AMINOBENZENES and the corresponding  $\alpha$ -alkyl ethers, manufacture.—I. G. Farbenindustrie. Nov. 15, 1933. (Cognate application 22197/34.) 22196/34.

FORMALDEHYDE CONCENTRATES, manufacture.—Deutsche Gold- und Silber Scheideanstalt Vorm. Roessler. Nov. 17, 1933. 31769/34.

ARTIFICIAL MATERIALS, manufacture.—British Celanese, Ltd. Nov. 14, 1933. 32764/34.

DYEING LEATHER.—J. R. Geigy A.-G. Nov. 18, 1933. 33202/34.

CYCLO  $\beta$ -KETO CARBOXYLIC ACIDS, manufacture of derivatives.—Sehering-Kahlbaum, A.-G. Nov. 18, 1933. 33271/34.

### Specifications Accepted with Date of Application

DYEING OF CELLULOSE ACETATE ARTIFICIAL SILK.—Soc. of Chemical Industry in Basle. Oct. 15, 1932. 428,767.

VAT DYESTUFF, manufacture and production.—J. Y. Johnson. Oct. 18, 1933. 428,770.

GLYCEROL, manufacture of derivatives.—E. L. Holmes. Nov. 10, 1933. 428,462.

NITROARYLAMINO-ARYLAMINES, manufacture.—I. G. Farbenindustrie. Nov. 17, 1932. 428,618.

AZO DYESTUFFS, production.—E. I. du Pont de Nemours and Co. and H. E. Woodward. Nov. 17, 1933. 428,697.

SYNTHETIC RESINS, production.—Dr. K. Albert Ges. Chemische Fabriken. March 8, 1933. 428,483.

CELLULOSE ACETATE ARTIFICIAL SILK, dyeing.—Soc. of Chemical Industry in Basle. Oct. 15, 1932. (Divided out of 428,767.) 428,841.

## Tariff Changes

### French Import Quotas

The French "Journal Officiel" of May 15 contains an Order, dated May 11, fixing the quotas for the import of chemical products into France during the period April 1 to June 30 as follows:

	Quota Kilograms.
Cyanide of potassium, free from sodium .....	1,527
Cyanides of potassium and sodium .....	5,575
Other Cyanides .....	2,438
Artificial cryolites .....	3,311
Chromic acid .....	13,780
Zinc chromate .....	1,477
Molybdc acid and molybdates .....	717
Lead oxides:—	
(1) Minium and litharge .....	247,200
(2) Orange lead and other lead oxides .....	11,025
Lead salts not specified in the Tariff .....	11,900
Butyl alcohol .....	51,600
Rectified methyl alcohol ( <i>méthylène</i> ) .....	247,025
Butyl acetate .....	72,500

### Union of South Africa

THE Board of Trade has received from the Union of South Africa a copy of the Customs Tariff Amendment Bill which contains a new three-column tariff. In the case of the following items the United Kingdom will be entitled to the intermediate rate of *ad valorem* duty in place of the maximum rate under the two-column tariff.

	Present Max. Duty.	Proposed Inter-med.	Max.
Barytes and pumice: in bulk .....	3%	Free	5%
Cement:—			
(b) Liquid, for tube mills .....	5%	Free	5%
Fireclay, kaolin, china clay and Cornish stone, and fire cements and furnace cements: in bulk .....	3%	Free	5%

Fullers' earth, not being a toilet preparation: in bulk .....	3%	Free	5%
Graphite or plumbago .....	3%	Free	5%
Gypsum (sulphate of lime or plaster of paris): in bulk .....	3%	Free	5%
Acetate of lead .....	3%	Free	5%
Barium carbonate and barium peroxide: in bulk .....	3%	Free	5%
Boiler compositions and preparations for removing scale in boilers .....	3%	Free	5%
Calcium:—			
(a) Carbonate, oxide, hydroxide, iodate, chloride, chlorate, phosphate, silicide, by-sulphite, cyanamide and sulpho-cyanide: in bulk .....	3%	Free	5%
Magnesium carbonate, magnesium chloride and magnesium sulphate: in bulk .....	3%	Free	5%
Nickel sulphate: in bulk .....	3%	Free	5%
Perochloride of iron: in bulk .....	3%	Free	5%
Potassium: carbonate, bicarbonate, silicate, bichromate, chlorate, chloride, sulphite, bi-sulphite, metabisulphide, permanganate, cyanide, sulpho-cyanide (thiocyanate), iodide, xanthate, red and yellow prussiate of, and caustic potash: in bulk .....	3%	Free	5%
Saltpetre: in bulk .....	3%	Free	5%
Bicarbonate, silicate, bichromate, chlorate, permanganate, sulphite, bi-sulphite, metabisulphite, sulphide, di-sodium, trisodium phosphate, xanthate, ferrocyanide, sulpho-cyanide (thio-cyanate) and caustic soda: in bulk .....	3%	Free	5%

Provision is made for the application of the "maximum" rates of duty to goods of any country with whom the Union of South Africa does not conclude a commercial agreement.

# Weekly Prices of British Chemical Products

## Review of Current Market Conditions

THERE are no price changes to report in the markets for general heavy chemicals, rubber chemicals, wood distillation products, pharmaceutical and photographic chemicals, perfumery chemicals, essential oils and intermediates. In the tar products market the price of cresylic acid, pale 80%, has been reduced by 7d. per gal. Unless otherwise stated the prices below cover fair quantities net and naked at sellers' works.

LONDON.—No change has occurred in chemical market conditions, but prices remain steady with a fair general demand.

MANCHESTER.—The tone of the Manchester chemical market during the past week has been reasonably cheerful and prices continue steady in respect of pretty well all classes of materials. A few contracts extending over fairly long delivery periods have

been booked here since last report, though the majority of users at the moment appear to be content to cover requirements over a month or so. In the aggregate new business has been fairly satisfactory, and sellers have little of which to complain from the point of view of deliveries against existing contracts, although there is still room for considerable improvement so far as textile chemicals are concerned. With regard to the by-products, these, for the most part, are about maintained though price conditions are somewhat patchy. Little speculative interest is being shown in pitch for next season, but refined tar is now moving more satisfactorily, and there is a good demand for carbolic acid and cresosote oil.

SCOTLAND.—There is little or no change in the Scottish heavy chemical market to report.

### General Chemicals

- ACETONE.—LONDON: £65 to £68 per ton; SCOTLAND: £66 to £68 ex wharf, according to quantity.
- ACID, ACETIC.—Tech., 80%, £38 5s. to £40 5s.; pure 80%, £39 5s.; tech., 40%, £20 5s. to £21 15s.; tech., 60%, £28 10s. to £30 10s. LONDON: Tech., 80%, £38 5s. to £40 5s.; pure 80%, £39 5s. to £41 5s.; tech., 40%, £20 5s. to £22 5s.; tech., 60%, £29 5s. to £31 5s. SCOTLAND: Glacial 98/100%, £48 to £52; pure 80%, £39 5s.; tech., 80%, £38 5s. d/d buyers' premises Great Britain. MANCHESTER: 80%, commercial, £39; tech. glacial, £32.
- ACID, BORIC.—Commercial granulated, £25 10s. per ton; crystal, £26 10s.; powdered, £27 10s.; extra finely powdered, £29 10s. packed in 1-cwt. bags, carriage paid home to buyers' premises within the United Kingdom in 1-ton lots.
- ACID, CHROMIC.—10½d. per lb., less 2½%, d/d U.K.
- ACID, CITRIC.—11½d. per lb. less 5%. MANCHESTER: 11½d.
- ACID, CRESYLIC.—97/99%, 1s. 8d. to 1s. 9d. per gal.; 98/100%, 2s. to 2s. 2d.
- ACID, FORMIC.—LONDON: £40 to £45 per ton.
- ACID, HYDROCHLORIC.—Spot, 4s. to 6s. carboy d/d according to purity, strength and locality. SCOTLAND: Arsenical quality, 4s.; dearsenicated, 5s. ex works, full wagon loads.
- ACID, LACTIC.—LANCASHIRE: Dark tech., 50% by vol., £24 10s. per ton; 50% by weight, £28 10s.; 80% by weight, £48; pale tech., 50% by vol., £28; 50% by weight, £33; 80% by weight, £53; edible, 50% by vol., £41. One-ton lots ex works, barrels free.
- ACID, NITRIC.—80° Tw. spot, £18 to £25 per ton makers' works, SCOTLAND: 80°, £24 ex station full truck loads.
- ACID, OXALIC.—LONDON: £47 17s. 6d. to £57 10s. per ton, according to packages and position. SCOTLAND: 98/100%, £48 to £50 ex store. MANCHESTER: £49 to £54 ex store.
- ACID, SULPHURIC.—SCOTLAND: 144° quality, £3 12s. 6d.; 168°, £7; dearsenicated, 20s. per ton extra.
- ACID, TARTARIC.—1s. per lb. less 5%, carriage paid for lots of 5 cwt. and upwards. MANCHESTER: 1s. 0½d. per lb.
- ALUM.—SCOTLAND: Lump potash, £8 10s. per ton ex store.
- ALUMINA SULPHATE.—LONDON: £7 10s. to £8 per ton. SCOTLAND: £7 to £8 ex store.
- AMMONIA, ANHYDROUS.—Spot, 10d. per lb. d/d in cylinders. SCOTLAND: 10d. to 1s. containers extra and returnable.
- AMMONIA, LIQUID.—SCOTLAND: 80°, 2½d. to 3d. per lb., d/d.
- AMMONIUM BICHROMATE.—8d. per lb. d/d U.K.
- AMMONIUM CARBONATE. SCOTLAND: Lump, £30 per ton; powdered, £33, in 5-cwt. casks d/d buyers' premises U.K.
- AMMONIUM CHLORIDE.—LONDON: Fine white crystals, £18 to £19. (See also Salammoniac.)
- AMMONIUM CHLORIDE (MURIATE).—SCOTLAND: British dog tooth crystals, £32 to £35 per ton carriage paid according to quantity. (See also Salammoniac.)
- ANTIMONY OXIDE.—SCOTLAND: Spot, £34 per ton, c.i.f. U.K. ports.
- ANTIMONY SULPHIDE.—Golden, 6½d. to 1s. 3d. per lb.; crimson, 1s. 5½d. to 1s. 7½d. per lb., according to quality.
- ARSENIC.—LONDON: £16 10s. per ton c.i.f. main U.K. ports for imported material; Cornish nominal, £22 10s. f.o.r. mines. SCOTLAND: White powdered, £23 ex wharf. MANCHESTER: White powdered Cornish, £23, ex store.
- ARSENIC SULPHIDE.—Yellow, 1s. 5d. to 1s. 7d. per lb.
- BARIUM CHLORIDE.—£11 per ton. SCOTLAND: £10 10s.
- BARYTES.—£6 10s. to £8 per ton.
- BISULPHITE OF LIME.—£6 10s. per ton f.o.r. London.
- BLEACHING POWDER.—Spot, 35/37%, £7 19s. per ton d/d station in casks, special terms for contract. SCOTLAND: £8 in 5/6 cwt. casks for contracts over 1934/1935.
- BORAX, COMMERCIAL.—Granulated, £14 10s. per ton; crystal, £15 10s.; powdered, £16; finely powdered, £17; packed in 1-cwt. bags, carriage paid home to buyer's premises within the United Kingdom in 1-ton lots.
- CADMIUM SULPHIDE.—3s. 4d. to 3s. 8d. per lb.
- CALCIUM CHLORIDE.—Solid 70/75% spot, £5 5s. per ton d/d station in drums.
- CARBON BISULPHIDE.—£30 to £32 per ton, drums extra.
- CARBON BLACK.—3½d. to 4½d. per lb. LONDON: 4½d. or ex works.
- CARBON TETRACHLORIDE.—SCOTLAND: £41 to £43 per ton, drums extra.
- CHROMIUM OXIDE.—10½d. per lb., according to quantity d/d U.K.; green, 1s. 2d. per lb.
- CHROMETAN.—Crystals, 3½d. per lb.; liquor, £19 10s. per ton d/d.
- COPPERAS (GREEN).—SCOTLAND: £3 15s. per ton, f.o.r. or ex works.
- CREAM OF TARTAR.—£3 19s. per cwt. less 2½%. LONDON: £3 17s. per cwt. SCOTLAND: £4 2s. less 2½%.
- DINITROTOLUENE.—66/68° C., 9d. per lb.
- DIPHENYLGUANIDINE.—2s. 2d. per lb.
- FORMALDEHYDE.—LONDON: £25 10s. per ton. SCOTLAND: 40%, £25 to £28 ex store.
- IODINE.—Resublimed B.P., 6s. 3d. to 8s. 4d. per lb.
- LAMPBLACK.—£45 to £48 per ton.
- LEAD ACETATE.—LONDON: White, £34 10s. per ton; brown, £1 per ton less. SCOTLAND: White crystals, £33 to £35; brown, £1 per ton less. MANCHESTER: White, £34 10s.; brown, £32 10s.
- LEAD NITRATE.—£27 10s. per ton.
- LEAD, RED.—SCOTLAND: £24 to £26 per ton less 2½%; d/d buyer's works.
- LEAD, WHITE.—SCOTLAND: £39 per ton, carriage paid. LONDON: £36 10s.
- LITHOPONE.—30%, £7 to £17 10s. per ton.
- MAGNESITE.—SCOTLAND: Ground calcined, £9 per ton, ex store.
- MAGNESIUM SULPHATE.—Commercial, £5 per ton, ex wharf.
- METHYLATED SPIRIT.—61 O.P. industrial, 1s. 5d. to 2s. per gal.; pyridinised industrial, 1s. 7d. to 2s. 2d.; mineralised, 2s. 6d. to 3s. Spirit 64 O.P. is 1d. more in all cases and the range of prices is according to quantities. SCOTLAND: Industrial 64 O.P., 1s. 9d. to 2s. 4d.
- NICKEL AMMONIUM SULPHATE.—£49 per ton d/d.
- NICKEL SULPHATE.—£49 per ton d/d.
- PHENOL.—7½d. to 8½d. per lb. to June 30; 6½d. to 7½d. from July 1 to December 31.
- POTASH, CAUSTIC.—LONDON: £42 per ton. MANCHESTER: £38 to £41.
- POTASSIUM BICHROMATE.—Crystals and Granular, 5d. per lb. less 5% d/d U.K. Discount according to quantity. Ground, 5½d. LONDON: 5d. per lb. less 5%, with discounts for contracts. SCOTLAND: 5d. d/d U.K. or c.i.f. Irish Ports. MANCHESTER: 5d.
- POTASSIUM CHLORATE.—LONDON: £37 to £40 per ton. SCOTLAND: 99½/100%, powder, £37. MANCHESTER: £38.
- POTASSIUM CHROMATE.—6½d. per lb. d/d U.K.
- POTASSIUM IODIDE.—B.P., 5s. 2d. per lb.
- POTASSIUM NITRATE.—SCOTLAND: Refined granulated, £29 per ton c.i.f. U.K. ports. Spot, £30 per ton ex store.
- POTASSIUM PERMANGANATE.—LONDON: 10½d. per lb. SCOTLAND: B.P. crystals, 10d. to 10½d. MANCHESTER: B.P., 11½d.
- POTASSIUM PRUSSIAN.—LONDON: Yellow, 8½d. to 8¾d. per lb. SCOTLAND: Yellow spot, 8½d. ex store. MANCHESTER: Yellow, 8½d.
- SALAMMONIAC.—First lump spot, £41 17s. 6d. per ton d/d in barrels.
- SODA ASH.—58% spot, £5 12s. 6d. per ton f.o.r. in bags.
- SODA, CAUSTIC.—Solid 76/77° spot, £13 17s. 6d. per ton d/d station. SCOTLAND: Powdered 98/99%, £17 10s. in drums, £18 5s. in casks, Solid 76/77°, £14 12s. 6d. in drums; 70/73%, £14 12s. 6d., carriage paid buyer's station, minimum 4-ton lots; contracts 10s. per ton less. MANCHESTER: £13 5s. to £14 contracts.
- SODA CRYSTALS.—Spot, £5 to £5 5s. per ton d/d station or ex depot in 2-cwt. bags.
- SODIUM ACETATE.—£22 per ton. LONDON: £22. SCOTLAND: £20.
- SODIUM BICARBONATE.—Refined spot, £10 10s. per ton d/d station in bags. SCOTLAND: Refined recrystallised £10 15s. ex quay or station. MANCHESTER: £10 10s.



**SODIUM BICHROMATE.**—Crystals cake and powder 4d. per lb. net d/d U.K. discount according to quantity. Anhydrous, 5d. per lb. LONDON: 4d. per lot less 5% for spot lots and 4d. per lb. with discounts for contract quantities. MANCHESTER: 4d. per lb. basis. SCOTLAND: 4d. delivered buyer's premises with concession for contracts.

**SODIUM BISULPHITE POWDER.**—60/62%, £20 per ton d/d 1-cwt. iron drums for home trade.

**SODIUM CARBONATE, MONOHYDRATE.**—£15 per ton d/d in minimum ton lots in 2 cwt. free bags. Soda crystals, SCOTLAND: £5 to £5 5s. per ton ex quay or station. Powdered or pea quality, 7s. 6d. per ton extra. Light Soda Ash £7 ex quay, min. 4-ton lots with reductions for contracts.

**SODIUM CHLORATE.**—£32 10s. per ton.

**SODIUM CHROMATE.**—4d. per lb. d, d U.K.

**SODIUM HYPOSULPHITE.**—SCOTLAND: Large crystals English manufacture, £9 5s. per ton ex stations, min. 4-ton lots. Pea crystals, £14 10s. ex station, 4-ton lots. MANCHESTER: Commercial, £10 5s.; photographic, £14 10s.

**SODIUM META SILICATE.**—£14 per ton, d/d U.K. in cwt. bags.

**SODIUM IODIDE.**—B.P., 6s. per lb.

**SODIUM NITRITE.**—LONDON: Spot, £18 5s. to £20 5s. per ton d/d station in drums.

**SODIUM PERBORATE.**—10%, 9½d. per lb. d/d in 1-cwt. drums. LONDON: 10d. per lb.

**SODIUM PHOSPHATE.**—£13 per ton.

**SODIUM PRUSSIATE.**—LONDON: 5d. to 5½d. per lb. SCOTLAND: 5d. to 5½d. ex store. MANCHESTER: 5d. to 5½d.

**SULPHUR.**—£9 15s. to £10 per ton. SCOTLAND: £8 to £9.

**SODIUM SILICATE.**—140° Tw. Spot £8 per ton. SCOTLAND: £8 10s.

**SODIUM SULPHATE (GLAUER SALTS).**—£4 2s. 6d. per ton d/d SCOTLAND: English material £3 15s.

**SODIUM SULPHATE (SALT CAKE).**—Unground spot, £3 12s. 6d. per ton d/d station in bulk. SCOTLAND: Ground quality, £3 5s. per ton d/d. MANCHESTER: £3 2s. 6d.

**SODIUM SULPHIDE.**—Solid 60/62%, Spot, £10 15s. per ton d/d in drums; crystals 30/32%, £8 per ton d/d in casks. SCOTLAND: For home consumption. Solid 60/62%, £10 5s.; broken 60/62%, £11 5s.; crystals, 30/32%, £8 7s. 6d., d/d buyer's works on contract, min. 4-ton lots. Spot solid 5s. per ton extra. Crystals, 2s. 6d. per ton extra. MANCHESTER: Concentrated solid, 60/62%, £11; commercial, £8 2s. 6d.

**SODIUM SULPHITE.**—Pea crystals spot, £13 10s. per ton d/d station in kegs. Commercial spot, £8 15s. d/d station in bags.

**SULPHATE OF COPPER.**—MANCHESTER: £14 15s. per ton f.o.b.

**SULPHUR CHLORIDE.**—5d. to 7d. per lb., according to quality.

**SULPHUR PRECIP.**—B.P. £55 to £60 per ton according to quantity. Commercial, £50 to £55.

**VERMILION.**—Pale or deep, 4s. 5d. to 4s. 7d. per lb.

**ZINC CHLORIDE.**—SCOTLAND: British material, 98%, £18 10s. per ton f.o.b. U.K. ports.

**ZINC SULPHATE.**—LONDON: £12 per ton. SCOTLAND: £10 10s.

**ZINC SULPHIDE.**—11d. to 1s. per lb.

### Intermediates and Dyes

**ACID, BENZOIC, 1914 B.P. (ex Toluol).**—1s. 9½d. per lb.

**ACID, GAMMA.**—Spot, 4s. per lb. 100% d/d buyer's works.

**ACID, H.**—Spot, 2s. 4½d. per lb. 100% d/d buyer's works.

**ACID NAPHTHIONIC.**—1s. 8d. per lb.

**ACID, NEVILLE AND WINTER.**—Spot, 3s. per lb. 100%.

**ACID, SULPHANILIC.**—Spot, 8d. per lb. 100% d/d buyer's works.

**ANILINE OIL.**—Spot, 8d. per lb., drums extra, d/d buyer's works.

**ANILINE SALTS.**—Spot, 8d. per lb. d/d buyer's works, casks free.

**BENZALDEHYDE.**—Spot, 1s. 8d. per lb., packages extra.

**BENZIDINE BASE.**—Spot, 2s. 5d. per lb., 100% d/d buyer's works.

**BENZIDINE HCL.**—2s. 5d. per lb.

**p-CRESOL 34.5° C.**—2s. per lb. in ton lots.

**m-CRESOL 98/100%.**—2s. 3d. per lb. in ton lots.

**DICHLORANILINE.**—1s. 11½d. to 2s. 3d. per lb.

**DIMETHYLANILINE.**—Spot, 1s. 6d. per lb., package extra.

**DINITROBENZENE.**—8d. per lb.

**DINITROTOLENE.**—48/50° C., 9d. per lb.; 66/68° C., 0½d.

**DINITROCHLOROBENZENE, SOLID.**—£72 per ton.

**DIPHENYLAMINE.**—Spot, 2s. per lb., d/d buyer's works.

**α-NAPHTHOL.**—Spot, 2s. 4d. per lb., d/d buyer's works.

**β-NAPHTHOL.**—Spot, £78 15s. per ton in paper bags.

**α-NAPHTHYLAMINE.**—Spot, 1½d. per lb., d/d buyer's works.

**β-NAPHTHYLAMINE.**—Spot, 2s. 9d. per lb., d/d buyer's works.

**o-NITRANILINE.**—3ss. 11d. per lb.

**m-NITRANILINE.**—Spot, 2s. 7d. per lb., d/d buyer's works.

**p-NITRANILINE.**—Spot, 1s. 8d. per lb., d/d buyer's works.

**NITROBENZENE.**—Spot, 4½d. to 5d. per lb.; 5-cwt. lots, drums extra.

**NITRONAPHTHALENE.**—9d. per lb.; P.G., 1s. 0½d. per lb.

**SODIUM NAPHTHIONATE.**—Spot, 1s. 9d. per lb.

**o-TOLUIDINE.**—9½d. to 11d. per lb.

**p-TOLUIDINE.**—1s. 11d. per lb.

### Wood Distillation Products

**ACETATE OF LIME.**—Brown, £8 10s. to £9. Grey, £12 to £14. Liquor, brown, 30° Tw., 8d. per gal. MANCHESTER: Brown, £11; grey, £13 10s.

**ACETIC ACID, TECHNICAL, 40%.**—£17 to £18 per ton.

**CHARCOAL.**—£5 to £10 per ton.

**WOOD CRESOSOTE.**—Unrefined, 3d. to 1s. 6d. per gal.

**WOOD NAPHTHA, MISCIBLE.**—2s. 6d. to 3s. 6d. per gal.; solvent, 3s. 3d. to 4s. 3d. per gal.

**WOOD TAR.**—£2 to £4 per ton.

### Coal Tar Products

**ACID, CARBOLIC.**—Crystals, 7½d. to 8½d. per lb.; crude, 60's, 1s. 1½d. to 2s. 2½d. per gal. MANCHESTER: Crystals, 7½d. per lb.; crude, 2s. 2d. per gal. SCOTLAND: 60's, 2s. 6d. to 2s. 7d.

**ACID, CRESYLIC.**—90/100%, 1s. 8d. to 2s. 3d. per gal.; pale 98%, 1s. 5d. to 1s. 6d.; according to specification. LONDON: 98/100%, 1s. 4d.; dark, 95/97%, 1s. SCOTLAND: Pale, 99/100%, 1s. 3d. to 1s. 4d.; dark, 97/99%, 1s. to 1s. 1d.; high boiling acid, 2s. 6d. to 3s.

**BENZOL.**—At works, crude, 9½d. to 10d. per gal.; standard motor, 1s. 3d. to 1s. 3½d.; 90%, 1s. 4d. to 1s. 4½d.; pure, 1s. 7½d. to 1s. 8d. LONDON: Motor, 1s. 3½d. SCOTLAND: Motor, 1s. 6½d.

**CRESOSOTE.**—B.S.I. Specification standard, 5½d. to 5½d. per gal. f.o.r. Home, 3½d. d/d. LONDON: 4½d. f.o.r. North; 5d. LONDON. MANCHESTER: 5d. to 5½d. SCOTLAND: Specification oils, 4d.; washed oil, 4½d. to 4½d.; light, 4½d.; heavy, 4½d. to 4½d.

**NAPHTHA.**—Solvent, 90/100%, 1s. 5d. to 1s. 6d. per gal.; 95/160%, 1s. 6d.; 99%, 1½d. to 1s. 1d. LONDON: Solvent, 1s. 3½d. to 1s. 4½d.; heavy, 1½d. to 1s. 0½d. f.o.r. SCOTLAND: 90/160%, 1s. 3d. to 1s. 3½d.; 90/190%, 1½d. to 1s. 2d.

**NAPHTHALENE.**—Purified crystals, £10 per ton in bags. LONDON: Fire lighter quality, £3 to £3 10s.; 74/76 quality, £4 to £4 10s.; 76/78 quality, £5 10s. to £6. SCOTLAND: 40s. to 50s.; whizzed, 70s. to 75s.

**PITCH.**—Medium soft, 40s. per ton. LONDON: 45s. per ton, f.o.b. East Coast port. MANCHESTER: 35s. f.o.b. East Coast.

**PYRIDINE.**—90/140, 6s. to 8s. 6d. per gal.; 90/180, 2s. 3d.

**TOLUOL.**—90%, 1s. 1½d. to 2s. per gal.; pure, 2s. 2d.

**XYLOL.**—Commercial, 1s. 1½d. to 2s. per gal.; pure, 2s. 1d. to 2s. 2d.

### Nitrogen Fertilisers

**SULPHATE OF AMMONIA.**—£7 5s. per ton; for neutral quality basis 20.6% nitrogen delivered in 6-ton lots to farmer's nearest station.

**CYANAMIDE.**—£7 5s. per ton delivered in 4-ton lots to farmer's nearest station.

**NITRATE OF SODA.**—£7 12s. 6d. per ton for delivery in 6-ton lots, carriage paid to farmer's nearest station for material basis 15.5% or 16% nitrogen.

**NITRO-CHALK.**—£7 5s. per ton in 6-ton lots carriage paid for material basis 15.5% nitrogen.

**CONCENTRATED COMPLETE FERTILISERS.**—£10 5s. to £10 17s. 6d. per ton according to percentage of constituents, for delivery in 6-ton lots carriage paid.

**NITROGEN PHOSPHATE FERTILISERS.**—£10 5s. to £13 15s. per ton.

### Latest Oil Prices

**LONDON, May 29.**—LINSEED OIL was quiet. Spot, £23 15s. per ton (small quantities); June, £21 7s. 6d.; July-Aug., £21 12s. 6d.; Sept.-Dec., £21 17s. 6d.; Jan.-April, £22 7s. 6d., naked. SOYA BEAN OIL was quiet. Oriental (bulk), June-July shipment, £20 10s. per ton. RAPE OIL was slow. Crude extracted, £32 10s. per ton; technical refined, £34, naked, ex-wharf. COTTON OIL was steady. Egyptian crude, £24 10s. per ton; refined common edible, £28 10s., and deodorised, £30 10s., naked, ex mill (small lots £1 10s. extra). TURPENTINE was easier. American, spot, 5½s. per cwt., June, 45s. 6d.

**HULL.**—LINSEED OIL, spot, quoted £22 10s. per ton; May, £21 17s. 6d.; June-Aug., £22; Sept.-Dec., £22 2s. 6d. COTTON OIL, Egyptian, crude, spot, £25 per ton; edible, refined, spot, £27 10s.; technical, spot, £27 10s.; deodorised, £29 10s., naked. PALM KERNEL OIL, crude, f.m.q., spot, £21 10s. per ton, naked. GROUNDNUT OIL, extracted, spot, £33 10s. per ton; deodorised, £36 10s. RAPE OIL, extracted, spot, £31 10s. per ton; refined, £33. SOYA OIL, extracted, spot, £25 per ton; deodorised, £28. CASTOR OIL, pharmaceutical, 4½s. per cwt.; first, 36s.; second, 33s. COD OIL, f.o.r. or f.a.s., 25s. per cwt. in barrels. TURPENTINE, American, spot, 53s. per cwt.

### Forthcoming Events

**June 6.**—Mineralogical Society. General meeting. 5.30 p.m. Burlington House, Piccadilly, London.

**June 6.**—Chemical Society. Ordinary scientific meeting. "The interpretation of the dissociation pressures of the palladium-hydrogen system." M. H. Hey; "The stereochemical relationships of some optically active amines and amino-acids. Part I. The configuration of valine." F. Barrow and G. W. Ferguson; "The preparation of organic compounds containing deuterium. Dideuteriomalonic deuterated and trideuteracetic deuterated." C. L. Wilson; "Experiments on deuterobenzene. Part I." G. R. Clemo and A. McQuillen. 8 p.m. Burlington House, Piccadilly, London.

# Chemical and Allied Stocks and Shares

## Current Quotations

The following table shows this week's Stock Exchange quotations of chemical and allied stocks and shares compared with those of last week. Except where otherwise shown the shares are of £1 denomination.

Name	May 28.	May 21.	Name	May 28.	May 21.
Anglo-Persian Oil Co., Ltd. Ord. ....	62/6	60/-	English Velvet & Cord Dyers' Association, Ltd. Ord. ....	4/4½	4/4½
" 8% Cum. Pref. ....	37/6	37/-	" 5% Cum. Pref. ....	7/6	7/6
" 9% Cum. Pref. ....	38/-	38/-	" 4% First Mort. Deb. Red. (£100) .....	£70	£70
Associated Dyers and Cleaners, Ltd. Ord. ....	1/10½	2/2½	Fison, Packard & Prentice, Ltd. Ord. ....	38/9	38/9
" 6½% Cum. Pref. ....	4/8½	4/8½	" 7% Non-Cum. Pref. ....	30/-	30/-
Associated Portland Cement Manufacturers, Ltd. Ord. ....	49/-	49/6	" 4½% Debs. (Reg.) Red. (£100) .....	£107	£107
" 5½% Cum. Pref. ....	27/9	27/9	Gas Light & Coke Co. Ord. ....	27/9	27/9
Benzol & By-Products, Ltd. 6% Cum. Part Pref. ....	2/6	2/6	" 3½% Maximum Stock (£100) ...	£87/10/-	£87/10/-
Berger (Lewis) & Sons, Ltd. Ord. ....	61/3	61/3	" 4% Consolidated Pref. Stock (£100) .....	£106/10/-	£106/10/-
Bleachers' Association, Ltd. Ord. ....	5/-	5/-	" 3% Consolidated Deb. Stock, Irred. (£100) .....	£90/10/-	£90/10/-
" 5½% Cum. Pref. ....	6/3	6/3	" 5% Deb. Stock, Red. (£100) .....	£117/10/-	£117/10/-
Boake, A., Roberts & Co., Ltd. 5% Pref. (Cum.) .....	21/3	21/3	" 4½% Red. Deb. Stock (1960-65) (£100) .....	£113/10/-	£113/10/-
Boots Pure Drug Co., Ltd. Ord. (5/-) ...	48/3	48/3	Goodlass Wall & Lead Industries, Ltd. Ord. (10/-) .....	12/6	12/6
Borax Consolidated, Ltd. Pfd. Ord. (£5) ...	96/3	96/3	" 7% Pfd. Ord. (10/-) .....	13/1½	13/1½
" Defd. Ord. ....	15/6	15/3	" 7% Cum. Pref. ....	27/6	27/6
" 5½% Cum. Pref. (£10) .....	225/-	225/-	Gossage, William, & Sons, Ltd. 5% 1st Cum. Pref. ....	24/4½	24/4½
" 4½% Deb. (1st Mort.) Red. (£100) .....	£109	£109	" 6½% Cum. Pref. ....	28/9	28/1½
" 4½% 2nd Mort. Deb. Red. (£100) .....	£103	£102	Imperial Chemical Industries, Ltd. Ord. ...	35/3	34/9
Bradford Dyers' Association, Ltd. Ord. ...	8/5½	7/6	" Deferred (10/-) .....	8/7½	8/6
" 5% Cum. Pref. ....	11/6½	8/9	" 7% Cum. Pref. ....	33/9	33/9
" 4% 1st Mort. Perp. Deb. (£100) .....	£83	£82	Imperial Smelting Corporation, Ltd. Ord. ....	15/-	15/-
British Celanese, Ltd. 7% 1st. Cum. Pref. ....	27/-	26/9	" 6½% Pref. (Cum.) .....	23/1½	23/1½
" 7½% Part. 2nd Cum. Pref. ...	19/6	19/6	International Nickel Co. of Canada, Ltd. Cum. ....	\$29½	\$29½
British Cotton & Wool Dyers' Association Ltd. Ord. (5/-) .....	5/-	5/-	Johnson, Matthey & Co., Ltd. 5% Cum. Pref. (£5) .....	95/-	95/-
" 4% 1st Mort. Deb. Red. (£100) .....	£92	£92	" 4% Mort. Deb. Red. (£100) .....	£98/10/-	£98/10/-
British Cyanides Co., Ltd. Ord. (2/-) .....	3/-	3/-	Laporte, B., Ltd. Ord. ....	110/-	112/6
British Drug Houses, Ltd. Ord. ....	18/9	18/9	Lawes Chemical Manure Co., Ltd. Ord. (1/-) .....	5/7½	5/7½
" 5% Cum. Pref. ....	22/6	22/6	" 7% Non-Cum. Part Pref. (10/-) .....	10/-	10/-
British Glues and Chemicals, Ltd. Ord. (4/-) .....	4/3	4/3	Lever Bros., Ltd. 7% Cum. Pref. ....	32/9	32/9
" 8% Pref. (Cum. and Part.) ...	26/10½	26/10½	" 8% Cum. "A" Pref. ....	33/6	33/6
British Oil and Cake Mills, Ltd. Cum. Pfd. Ord. ....	46/10½	46/3	" 20% Cum. Pfd. Ord. ....	78/9	78/1½
" 5½% Cum. Pref. ....	26/3	26/3	" 5% Cons. Deb. (£100) .....	£109	£108
" 4½% First Mort. Deb. Red. (£100) .....	£108/10/-	£108/10/-	" 4% Cons. Deb. (£100) .....	£105	£105
British Oxygen Co. Ltd. Ord. ....	95/-	91/3	Magadi Soda Co., Ltd. 12½% Pref. Ord. (5/-) .....	1/3	1/3
" 6½% Cum. Pref. ....	31/10½	31/10½	" 6% 2nd Pref. (5/-) .....	6d.	6d.
British Portland Cement Manufacturers, Ltd. Ord. ....	85/-	85/-	" 6% 1st Debs. (Reg.) .....	58/-	58/-
" 6% Cum. Pref. ....	29/-	29/-	Major & Co., Ltd. Ord. (5/-) .....	7½d.	7½d.
Bryant & May, Ltd. Pref. ....	67/6	67/6	" 8% Part. Pfd. Ord. (10/-) ...	9d.	9d.
Burt, Boulton & Haywood, Ltd. Ord. ...	19/4½	19/4½	" 7½% Cum. Pref. ....	1/6½	1/6½
" 7% Cum. Pref. ....	27/6	27/6	Mond Nickel Co., Ltd. 5½% Mort. Deb. Red. (£100) .....	£108	£108
" 6% 1st Mort. Deb. Red. (£100) .....	£105/10/-	£105/10/-	Pinchin, Johnson & Co., Ltd. Ord. (10/-) .....	42/6	43/-
Bush, W. J., & Co., Ltd. 5% Cum. Pref. (£5) .....	105/-	105/-	" 7% Cum. Pref. ....	38/1½	25/-
" 4% 1st Mort. Deb. Red. (£100) .....	£96/10/-	£96/10/-	Potash Syndicate of Germany (Deutsches Kalisyndikat G.m.b.H.) 7% Gld. Ln. Sr. "A" and "B" Rd. ....	64/6	64/6
Calico Printers' Association, Ltd. Ord. ...	9/4½	8/9	Reckitt & Sons, Ltd. Ord. ....	115/-	113/9
" 5% Pref. (Cum.) .....	15/7½	15/7½	" 4½% Cum. 1st Pref. ....	25/-	25/-
Cellulose Acetate Silk Co., Ltd. Ord. ....	13/11	13/9	Salt Union, Ltd. Ord. ....	41/3	41/3
" Deferred (1/-) .....	9/10½	9/10½	" Pref. ....	45/-	45/-
Consett Iron Co., Ltd. Ord. ....	7/3	7/-	" 4½ Deb. (£100) .....	£111/10/-	£111/10/-
" 8% Pref. ....	23/9	21/10½	South Metropolitan Gas Co. Ord. (£100) .....	£132/10/-	£132/10/-
" 6% First Deb. stock, Red. (£100) .....	£100/10/-	£97/10/-	" 6% Irred. Pref. (£100) .....	£149/10/-	£149/10/-
Cooper, McDougall & Robertson, Ltd. Ord. ....	36/3	33/9	" 4% Pref. (Irred.) (£100) .....	£106/10/-	£106/10/-
" 7% Cum. Pref. ....	29/-	29/-	" Perpetual 3% Deb. (£100) ...	£89/10/-	£89/10/-
Courtaulds, Ltd. Ord. ....	56/9	53/9	" 5% Red. Deb. 1950-60 (£100) .....	£115/10/-	£115/10/-
" 5% Cum. ....	26/3	26/3	Staveley Coal & Iron Co., Ltd. Ord. ....	43/9	43/9
Crosfield, Joseph, & Sons, Ltd. 5% Cum. Pre-Pref. ....	25/-	25/-	Stevenson & Howell, Ltd., 6½% Cum. Pref. ....	26/3	26/3
" Cum. 6% Pref. ....	28/9	28/9	Triplex Safety Glass Co., Ltd. Ord. (10/-) .....	72/6	68/9
" 6½% Cum. Pref. ....	28/9	28/9	Unilever, Ltd. Ord. ....	29/4½	29/4½
" 7½% "A" Cum. Pref. ....	30/7½	30/7½	" 7% Cum. Pref. ....	29/9	30/3
Distillers Co., Ltd. Ord. ....	93/-	94/-	United Glass Bottle Manufacturers, Ltd. Ord. ....	39/6	39/4½
" 6% Pref. Stock Cum. ....	32/-	32/-	" 7½% Cum. Pref. ....	38/-	38/-
Dorman Long & Co., Ltd. Ord. ....	18/11	14/3	United Molasses Co., Ltd. Ord. (6/8) ....	20/7½	20/7½
" Prefd. Ord. ....	16/10½	13/9	" 6% Cum. Pref. ....	25/-	25/-
" 6½% Non-Cum. 1st Pref. ....	20/6	19/6	United Premier Oil & Cake Co., Ltd. Ord. (5/-) .....	4/9	4/9
" 8% Non-Cum. 2nd Pref. ....	18/1½	14/3	" 7% Cum. Pref. ....	23/9	25/-
" 4% First Mort. Perp. Deb. (£100) .....	£102/10/-	£102/10/-	" 6% Deb. Red. (£100) .....	£102	£102
" 5% 1st Mort. Red. Deb. (£100) .....	£105	£104			

## From Week to Week

THE TEXTILE INSTITUTE is to hold its annual conference at Ilkley on June 12, 13, and 14.

WM. NEILL AND SON (ST. HELENS), LTD., has increased their nominal capital by the addition of £3,000, beyond the registered capital of £15,000.

THE CZECHO-SLOVAKIAN GOVERNMENT has lent to the Oxford University for three years 1,636.6 milligrams of radium, which the University has thought it wise to insure for £20,000.

BURMAH MILLS, BLACKBURN, have been acquired by Fountain Yarn Dyers (Blackburn), Ltd. It is hoped to find work for 60 or 70 people in a new process of dyeing, which has come through the experimental stages with satisfaction.

THE STURTEVANT ENGINEERING CO., LTD., has received the order for a phosphate grinding plant from National Fertilisers, Ltd., which is the largest order for such plant ever placed in this country for the manufacture of superphosphate.

THE COURT OF APPEAL, on May 28, dismissed the application by Mr. Charles Kinross, of New Broad Street, E.C., against a decision by Mr. Justice Bennett dismissing his petition for the compulsory winding-up of Duffield Coal Products, Ltd.

COAL AND ALLIED INDUSTRIES state that the capital of the company will be sufficient to complete the plant at Seaham Harbour, together with the additional plant to treat other chemicals which the process will produce. A semi-technical plant treating one ton of coal per day and identical in all respects with the large scale plant, has been put into operation and is working continuously.

SIXTY BY-PRODUCTS are now being made at the chemical works of the Belfast Corporation's gas undertaking, states the annual report which has just been presented. The manager, Mr. D. J. Smith, comments that owing to the development of intense competition the prospect for the tar and ammonia products is less satisfactory than usual and a still lower return from these sources may be anticipated.

A TALK ON POISON GAS was given to members of the staff of British Insulated Cables, Ltd., Prescot, and others, in the company's canteen on May 23, by Dr. G. C. W. Hay, of Whiston Infirmary. The lecturer described the effects of numerous chemical warfare agents, such as tear and sneezing gases, lung irritants, and blistering gases, and, speaking of lewisite, which has not yet been used in war, he said it had properties like arsenical poisoning and smelt like germanium.

NEGOTIATIONS which have been carried on in the United States by officials of the German Potash Syndicate have resulted in an agreement regarding propaganda for potash sales and research into potash problems. This agreement is regarded as confirmation of the agreement in principle recently concluded between the Franco-German Potash Syndicate and the Spanish producers, who receive a quota of about 14 per cent. of the potash sales of the Franco-German-Spanish group.

COKING AND BY-PRODUCT PLANT will be completed shortly at Harworth Main Colliery, near Doncaster. The works are equipped to deal with 600 tons of coal a day, and from this can be produced 400 tons of coke, seven tons of sulphate of ammonia, as well as other valuable fertilising products, 25 tons (approximately) of crude tar, large quantities of gas, and 1,800 gallons of motor benzol. It is hoped to secure annually half a million gallons of motor spirit suitable for cars, while a separate tar distillation plant has been erected to prepare pitch, road tar and oils used in dye-making and chemical industries. It is also intended to install a laboratory which will serve the new works and the two Doncaster district collieries of the owners.

AT THE SUMMER MEETING of the Society of Chemical Industry's Food Group at Norwich on May 25, Dr. J. G. Davis, of the National Institute for Research in Dairying, Reading, speaking of cheesemaking, said that, although accurate chemical knowledge of the substances responsible for the characteristic flavours of different types of cheese was lacking, there was no reason why a synthetic cheese flavour or aroma should not be made by a suitable mixing of the constituents when these became known. Cheese graders, he added, frequently graded cheese on the aroma alone because continual sampling of the cheese had such a fatiguing effect on the palate. The ripening of a cheese involved physical, chemical, biochemical, and microbiological factors. Dr. E. A. Fisher, speaking on problems of nutrition, said that there was safety in variety. Ailments connected with dietary were probably due as much to ignorance of how to feed as to actual deficiencies in the diets available. A large section of the population, comprising nearly 2,000,000 unemployed workers and their dependents, was probably living nearer the bare subsistence level than was desirable. Possibly bread and margarine were important parts of the diet of this section of the community. That diet was too simple and was not properly balanced.

THE CROWN CORK CO., LTD., has increased its nominal capital by the addition of £799,900 beyond the registered capital of £100.

THE INTERNATIONAL NITRATE AGREEMENT, which expires in June, was discussed in Paris last week between representatives of the Chilean and synthetic nitrate producers.

BRITISH PLASTER BOARD announces that an arrangement has been entered into with Gypsum Mines under which the whole of the ordinary share capital of the latter company will be acquired on the basis of an exchange of shares.

IN THE CHANCERY DIVISION on May 28 Mr. Justice Luxmoore confirmed a reduction of the capital of Hadfields, Ltd., from £2,500,000 to £1,570,108 by cancelling capital which has been lost or was unrepresented by available assets.

THE VALUE OF IMPORTS into Finland during the first quarters of 1935 and 1934 of goods purchased in the United Kingdom was, in million F. marks, as follows:—Oils, fats and waxes, 10.6 for 1935 against 6.8 for 1934; colours and dyes, 1.3 against 0.8; chemicals, 4.6 against 3.6.

A NEW OIL COMPANY is reported to have been established at The Hague under the title of the Dutch New Guinea Petroleum Co. The constituent concerns are Bataafsche Petroleum, the producing company of the Royal Dutch Group, Dutch Colonial Petroleum and Netherlands Pacific Oil.

REGULATIONS under Section 6 (1) of the Petroleum (Production) Act, 1934, regarding the grant of licences to search and bore for and get petroleum in Great Britain, have been made by Mr. Ernest Brown, Secretary for Mines. The regulations will come into force on June 17, and copies will shortly be available for purchase from H.M. Stationery Office, Adastral House, Kingsway, London.

FOAM EXTINGUISHERS and the company's own brigade were responsible for getting under control an alarming fire at the works of the South Western Tar Distillery, Cattedown, Plymouth, on May 23. The outbreak originated in one of the large stills filled with crude oil. The company's brigade was able to check the conflagration, and when the Plymouth City Fire Brigade arrived the fire was completely extinguished.

ORGANIC INDUSTRIAL TOXINS were described in a lecture recently given at the University, Birmingham, by Dr. Howard E. Collier, Reader in the Department of Industrial Hygiene and Medicine. He said the rapid development during comparatively recent years of the science of organic chemistry, and especially the development of the organic solvents and of the anilines, had raised innumerable problems for the industrial hygienist. In the past industrial poisoning had resulted in a number of fatalities. These had hindered the development of some useful and necessary industrial processes.

DORMAN, LONG AND CO., LTD., are to install at their Cleveland works at Southbank extensive coke-oven plant. The order has been placed with Simon-Carves, Ltd., of Cheadle Heath, near Stockport, and the plant, which is to be constructed at the Cleveland works, comprises 136 ovens together with complete by-product plant, coal-blending, coke-handling to the blast-furnaces, and coke-screening plant, to be built at Cleveland Ironworks. The 136 ovens will have a total capacity of more than 3,000 tons of raw coal per day, and each oven will be approximately 45 ft. long and 15 ft. high with a mean width of 18 in., fitted with the latest type of self-sealing doors.

SEVERAL VALUABLE PAPERS and interesting discussions will be included in the programme of this year's annual conference of the National Smoke Abatement Society at Bristol. The perpetuation of the domestic smoke nuisance in the new housing estates is a subject to which much attention has been drawn, but which requires a great deal more. A whole session of the conference will be devoted to what is actually being done in new housing and rehousing schemes. There will be a practical paper on an important aspect of the industrial problem, and there are to be papers by two authorities whose work upon the smoke problem is well known. Dr. R. Lessing is to give a paper on "Smoke Abatement and the Coal Industry," which will doubtless clarify the economic problems that must arise as the changeover to smokeless methods becomes more general. "Smoke and the Countryside" will be the title of a paper to be read by Dr. A. G. Ruston, who is the joint author with Professor J. B. Cohen, of "Smoke," in which the important Leeds researches on the effects of smoke upon vegetation are recorded. Smoke is a problem that affects the countryside in many ways, especially in wide belts around the industrial areas, and Dr. Ruston, who is Lecturer and Advisory Economist in the Agricultural Economics Section of the Leeds University Department of Agriculture, will be able to treat the subject with the knowledge and authority that it demands.

## Commercial Intelligence

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

### Mortgages and Charges

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

#### Satisfactions

**CASTNER-KELLNER ALKALI CO., LTD.**, London, S.W. (M.S., 1/6/35.) Satisfaction reg. May 17, £210,153, outstanding July 1, 1908.

**J. M. AND W. DARLING, LTD.**, South Shields, mfg. chemists, etc. (M.S., 1/6/35.) Satisfaction reg. May 22, £1,047 14s. 0d. reg. July 22, 1930.

**SUNLIGHT DYE WORKS AND LAUNDRY, LTD.**, Southampton. (M.S., 1/6/35.) Satisfaction reg. May 18, of mort. reg. April 9, 1930.

### Bill of Sale

**COFMAN-NICORESTI**, Carol Adolph, Ravenscourt, 37 Cole Park Road, Twickenham, late of Hermon Hill, Snaresbrook, manufacturing chemist. (B.S., 1/6/35.) Dated May 16. Filed May 23. £450.

### London Gazette, etc.

#### Companies Winding-up Voluntarily

**UNIVERSAL LATEX PRODUCTS, LTD.** (C.W.U.V., 1/6/35.) Creditors' claims to Arthur Rawlins, of 1 Ironmonger Lane, London, E.C.2, liquidator of the company, by June 20.

**MANCHESTER CHINA CLAY CO., LTD.** (C.W.U.V., 1/6/35.) By special resolution May 18. John Hoyle, St. Austell, Cornwall, and William Stanley Berry, of Manchester, appointed liquidators. All creditors have been, or will be, paid in full.

**BLANC FIXE MANUFACTURERS, LTD.** (C.W.U.V., 1/6/35.) Creditors' claims by June 11 to Philip Francis Keens, incorporated accountant, 11 George Street West, Luton, Bedford, the liquidator of the company.

#### Partnership Dissolved

**WOODFORD BY-PRODUCTS** (George Mallinson, Wm. Ford, Arthur Valentine Cave), manufacturers of soda crystals, Oak Road, Newland, Kingston-upon-Hull, by mutual consent, May 14, 1935.

## Company News

**Herbert Morris, Ltd.**—An interim dividend of 5 per cent. is announced on the ordinary shares, for the half-year to January 31 last.

**Dynamit-Nobel Co.**—It is announced that a dividend of 6 per cent. is to be distributed on the preference shares and 3½ per cent. on the ordinary shares for 1934. The net profits for the year amounted to Rm.1,679,000, of which Rm.100,000 were carried forward.

**Tate and Lyle, Ltd.**—An interim dividend of 6 per cent., less tax, is declared on the ordinary capital of £3,400,000, payable on June 15. This is the same as a year ago when the final dividend of 16½ per cent. brought the total distribution up to 22½ per cent., compared with 17 per cent. for 1932-33.

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Works: Silvertown, E.16

Telegrams: "Hydrochloric Fen, London."

**A. B. Fleming and Co.**—Including £21,476 brought in, the balance at the credit of profit and loss for the year to April 30 last was £71,618. To general reserve is placed £5,000; to plant depreciation reserve £13,000; to staff pension and benevolent fund £1,000, leaving to be carried forward £21,368.

**Veno Drug Co.**—For the year to March 31 last a profit of £125,874 is reported. This includes investment income and £3,651 profit on investment sales, and compares with £124,221 in 1933-34, and with £116,718 in 1932-33. After deducting fees, tax and fixed preference and preferred dividends, further transfer of £20,000 is made to special reserve, and dividend on deferred ordinary capital raised by 1 per cent., to 74 per cent. The balance carried forward is £3,536.

**North Broken Hill.**—A dividend of 1s. 6d. per share, or 6½ per cent., is announced. In addition, a bonus of 1s. per share, or 5 per cent., is to be paid. Both dividend and bonus will be paid on June 28. At this time last year an interim dividend of 7½ per cent. was paid, but there was no bonus distribution. This payment makes a total distribution to date for the year to June 30 next of 27½ per cent. For the same period last year the same dividend was paid.

**J. C. and J. Field.**—The net profit to March 31 last amounted to £19,537, against £19,019 in the previous year, to which is added £9,389 brought in, leaving available after payment of the interim dividend of 3½ per cent., less tax, on the preference shares, £25,536; a final dividend of 3½ per cent. is paid on the preference shares, less tax, making 7 per cent., dividend of 10 per cent. and bonus of 2½ per cent. on ordinary, less tax, to writing off goodwill, £2,000, to reserve, £4,000, leaving to be carried forward £9,989.

**Shropshire Beet Sugar Co.**—A trading profit, including subsidy, of £68,115 is shown for the year to March 31 last, against £40,760. After providing for fees, interest, tax and depreciation a balance of £15,161 remains, and a dividend of 20 per cent., tax free, is to be paid on the deferred shares and 10 per cent. on the preferred ordinary shares. A balance of £17,935 is carried forward, against £6,459. The last dividend on the deferred shares was 20 per cent., tax free, for 1929-30. Last year's preferred ordinary dividend was 8 per cent.

## Chemical Trade Inquiries

The following trade inquiries are abstracted from the "Board of Trade Journal." Names and addresses may be obtained from the Department of Overseas Trade (Development and Intelligence), 35 Old Queen Street, London, S.W.1 (quote reference number).

**Australia.**—A Melbourne firm of manufacturers' representatives desires to secure the agency, on a commission basis, of United Kingdom manufacturers of component parts for refrigerators (automatic controls, thermostats, high-pressure safety cut-outs, magnetic valves, soft annealed dehydrated and sealed copper tubing, thermostatic and pressure-operated valves), and moulding powder, for Victoria and South Australia. (Ref. No. 477.)

**Canada.**—A firm of manufacturers' agents in Vancouver desires to secure the representation in British Columbia and Alberta, on either a commission or consignment basis, of United Kingdom manufacturers of thermometers and bakelite. (Ref. No. 483.)

**Sweden.**—An agent established at Gothenburg wishes to obtain the representation, on a commission basis, of United Kingdom manufacturers of colours, etc. (Ref. No. 494.)

## Books Received

**The Application of Absorption Spectra to the Study of Vitamins and Hormones.** By R. A. Morton. London: Adam Hilger, Ltd. Pp. 70. 10s.

**Hochpolymere organische Naturstoffe.** By Dr. Hansjurgen Saechtling. Braunschweig: Friedr. Vieweg and Sohn. Pp. 124. 8 RM.

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