The Chemical Age

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Notes and Comments

Overseas Trade and Unemployment

THE home trade of the United Kingdom, regarded as a whole, has now palpably settled down into a steady and assured position. Unparalleled effort for three years on the part of the National Government and of manufacturers and merchants alike, have made the home market definitely secure. That, however, is by no means enough. The unemployed will never be brought down to a manageable figure, and prosperity will not be fully restored, until the oversea trade comes once more into its own. Even here the omens are favourable without being spectacular. The import and export statistics for July as published by the Board of Trade show a really substantial advance all along the line. Comparisons with the previous month should be ignored, the true criterion being the figures of July, 1933. Here the comparison is absolute as the two months contained an equal number of working days. We find that oversea trade is so far improved in the last twelve months that imports, of which virtually half were food and raw materials, have increased by eight per cent., and exports by nearly eleven per cent. The export figures are even more encouraging when they are analysed. Manufactured articles account for all but a small fraction of the increase, which is distributed over nearly all the sections of British industry. The steadiness of the trade advances in 1934 is almost as hopeful a sign of revival on right lines as the advance itself.

The Vacant Technical Post

COINCIDENT with the present trade revival some emphasis may be laid upon the too brief advertisements for technical assistants which generally appear in the daily Press, though not necessarily in the technical journals. In some circumstances brevity may have its advantages, but when employers complain of the quality and the quantity of the replies to such advertisements the remedy is in their own hands. If they would indicate the branch of industry for which the chemist or technician is required—analytical, research, oils and fats, paint and varnish, heavy chemicals, fine chemicals or drugs, metallurgical—together with an age limit, they would receive more applications from chemists with experience in their industry, and avoid applications from those who have no knowledge suitable to their requirements. The employer receives one hundred, two hundred or even five hundred replies under a box number, and immediately comes to the conclusion that there is a serious surplus of chemists, whereas actually there may be only a limited number suitable for the position.

It is rather heart-breaking to the chemist to write fifty or one hundred applications for vaguely worded advertisements and to receive no acknowledgement; over a period of three or six months the question of expense is also an item to be considered, as there is not only the cost of the stamp but the cost of carefully duplicated schedules of experience and references which are seldom, if ever, returned. Since time is money to the employer an extra shilling or two shillings on the advertisement would be well invested, as it would save a considerable amount of time in handling a large number of unsuitable replies. Cement chemists would avoid applying for oil or foodstuff appointments, men experienced in fine chemicals, bio-chemistry, etc., would know that it would be useless to write letters of application for a position in the rubber industry.

The Inquiry for New Plant

THE relationship that should exist between the chemical industry and the manufacturer of chemical plant was dscussed in THE CHEMICAL AGE of July 7. The point we then stressed was primarily that of the need for encouraging the chemical plant maker by allowing him a fair economic price for any goods ordered. That, however, is not the only factor in the inter-relationship of the two that needs to be stressed. The supplier of chemical plant is primarily an engineer; most of the members of the Association of British Chemical Plant Manufacturers are engineering firms without direct knowledge of the operation of a chemical plant. Many of them have no chemist, for the supply of plant to the chemical industry is but a small part of their business. There is, therefore, plenty of opportunity for misunderstandings and mistakes unless due precautions are taken.

Too often the chemical manufacturer sends out a somewhat hazy and generalised inquiry without specifying exactly what is needed; frequently the plant manufacturer will not know many of the relevant facts which must govern the design of the installation. The result is too often that tenders without detailed specifications are submitted, in the course of which those firms who know the ropes are handicapped because they have designed plant to overcome the pitfalls that must otherwise arise, whereas other manufacturers who do not design the plant with this end in view quote a lower price and secure the order. It is most neces-

sary that for small plant the chemical manufacturer should specify exactly what is required, while for more pretentious installations there should be a consultation between the two parties prior to the submission of tenders. Very often this consultation will permit the plant to be improved; usually it will avoid future disappointment after erection; at the least it will enable every maker to quote to similar specifications. There is more divergence between prices arising from differences in thickness of material *et hoc genus omne* than many chemists are aware of. Unless such things are carefully compared it is impossible to accurately decide between rival tenders. We trust that prior to placing orders the chemical manufacturer will bear in mind the necessity for submitting all relevant information and will recollect in so doing that the maufacturer of plant is not in general an expert chemist.

Dissatisfaction about Date of Delivery

A POTENT cause of dissatisfaction is the date of delivery of new plant. The natural human tendency for procrastination renders us peculiarly susceptible to putting off placing orders till the last minute. The result is generally that second only to considerations of price is the date of delivery. It is a bad thing to place orders upon that basis. The firms that are busiest, and to some extent that means the firms whose work is most sought after and is most reliable, are generally unable to promise quick delivery. Rushed work is apt to be less satisfactory than work over which the craftsman can take his time. Buyers are, of course, entitled to differentiate between a reasonable time of delivery and an excessive time, but if chemical manufacturers would look well ahead and start their negotiations some months before the plant is required they could allow the plant maker ample time. Very often, by so allowing ample, or even excessive time, the plant can be produced cheaper, so the buyer gets a double advantage. The buyer can do much to smooth the difficulties that arise in regard to the supply of material and plant by placing his orders early enough and with due regard to the exigencies of manufacture. Provided that the buyer does his part, there is an onus on the plant manufacturer to keep to his delivery dates. The complaint of late delivery is common, and there are faults on both sides.

A Need for Closer Co-operation

We believe that when buyers realise that late delivery is often due to their own fault there will be less difficulty. When ample time is given and both sides have agreed beforehand that the time is reasonable, a manufacturer who does not keep his delivery dates without real and unforeseen reason cannot complain if he ceases to receive inquiries from the customer he has let down. Above all let us stop the system whereby a plant manufacturer knowing that an order is to be settled partly upon early delivery deliberately quotes an earlier date than he can reasonably expect to fulfill knowing that he can always find ways and means of " getting away with it." The remedy lies in closer co-operation between buyer and seller, so that the buyer, before placing the order thoroughly understands the factors that govern the reasonable delivery date.

Inspection Before Delivery

GIVEN co-operation before the receipt of the tenders to ensure that the plant manufacturer really understands what is required, given co-operation before placing the order to ensure that the chemical manufacturer really understands the significance of all items in the competing tenders, and given co-operation in regard to delivery dates, is satisfaction assured? Not at all. The opportunities that exist in human intercourse for misunderstandings are so manifold that with the best will in the world difficulties will occur. The plant itself may not correctly interpret the wishes of the buyer; when the finished article arrives it is found to faulty. The defect may be a fault in design, it may be an unnoticed defect in a casting or plate, or there may be some peculiarity which the user has found to cause troubles on previous occasions; in extreme instances there may be defects which the manufacturer has noticed and has not corrected because for most purposes the patched-up job would be fully satisfactory —not realising that the more searching action of a chemical plant may magnify defects and result in complete breakdown. All these difficulties can be avoided by a thorough inspection of the plant at the maker's works prior to despatch. Mistakes can be corrected quickly and without having to pay the double cost of carriage. If the staff of the chemical works is not fully able to undertake a detailed inspection, the services of a consultant may be secured.

Co-operation After Installation

EVEN when the plant is erected and operating, things may go wrong. It is in the last degree foolish for the average chemical manufacturing concern to try to right matters unaided. Even if they succeed, the feeling is left that the plant manufacturer has been at fault. It is infinitely better from every aspect for the buyer to call in the maker to collaborate in solving difficulties as they arise. The chemical engineer is not an engineer in the sense of the word understood by an engineering workshop; each is a specialist in his own line. The chemical plant requires the co-operation between the three specalists—the operator, who knows what the plant must do, what has been his prior experience and what metals are desirable; the designer who will correctly proportion the several portions of the installation (the operator and designer may be the same man—the chemical engineer); and the plant maker, who is accustomed to handling metals and can suggest ways of doing a job which are unknown to the purely chemical engineer. Co-operation after installation is just as important as co-operation in the earlier stages.

Industrial Accidents

THE July issue of " Descriptions of Accidents Notified to H.M. Inspector of Factories," which is published quarterly (H.M. Stationery Office, 3d.) contains, *inter alia*, reports on acid leakage from an earthenware cock, explosions in metal foundries, an explosion at a suction-gas plant, explosion of a gas cooler, explosion in a petrol tank wagon, a dangerous method of cleaning dirty spirit, and various cases of gassing. With the same issue is enclosed an index which shows how great a variety of accidents is covered by these reports which should be studied by works managers and others in control of plant. The reports embody precautions recommended by the inspectors, or devised by the employers, against repetition of the accidents concerned.

Fume Emission Troubles in Scotland

The Annual Report of the Chief Inspector of Alkali Works Reveals Some Unusual Cases

THE seventieth annual report of the Chief Inspector of Alkali, etc., Works for the year 1933 contains special reference to the emission of fumes in Scotland where the number of works registered during 1933 was 101, in which were operated 177 scheduled processes:—4 alkali (salt cake); 1 alkali (wet copper); 1 smelting; 11 chemical manure; 4 nitric acid; 11 sulphuric acid; 8 sulphuric acid (Class II); 8 bisulphite; 7 lead deposit; 8 sulphide; 39 sulphate of ammonia; 4 muriate of ammonia; 13 gas liquor; 43 tar; 1 arsenic; 3 nitrate of iron; 1 picric acid; 1 chloride of iron; 3 chlorine; 1 carbon bisulphide; 2 muriatic acid; 1 paraffin oil; 2 zinc extraction. The number of registered works decreased by 4 as compared with 1932, but actually 8 works discontinued registration whilst 4 new ones were added to the register. Of the works which allowed their registration to lapse, 7 were for the manufacture of sulphate of ammonia and the other for the distillation of tar. The processes were subsidiary to the manufacture of gas. The new works included 1 for the manufacture of sulphate of ammonia, 1 for sulphate of ammonia and the distillation of tar, and 2 for the recovery of zinc from residues containing that metal.

During the year 459 visits of inspection were made to registered works, and 209 chemical tests were carried out. There were also 129 visits made to places not included in the register, and 17 chemical tests and experiments were performed.

Odours from Petroleum Refining

The clauses of the Alkali, etc., Works Regulation Act 1906, and the Alkali, etc., Works Order, 1928, which regulate the escape of noxious fumes have generally been well complied with, but there have been cases where the limits laid down by the Act have been exceeded and several minor complaints have been received. On each occasion, however, the necessary steps to reduce the escape or to mitigate the nuisance were taken immediately by the manufacturers concerned, and it was not necessary at any time to resort to legal action.

During late years a complaint has been made on many occasions of the objectionable nature of the odours emitted by a factory in Stirlingshire where crude petroleum is refined, and in the report for 1932 a reference was made to the steps which have been taken to mitigate the nuisance. The district is not yet entirely free from oily odours, but these do not now seem to be so intense or of such long duration. Occasionally objectionable odours are observed, but their frequency is diminishing and the owners of the works are adopting the policy of gradual elimination. It is doubtful whether the odours will ever be entirely eliminated, but much has already been done and it is hoped that conditions will gradually improve.

An Offence at a Viscose Factory

With regard to the progress made during the year in the matter of eliminating the offensive odours emitted by the viscose factory in Roxburghshire, it is interesting to report that the steps which have been taken have so far proved satisfactory, and the nuisance has now been very much reduced. In the last report it was indicated that the method employed for the prevention of objectionable smells was the destruction of the organic material in the exhaust gases by means of gaseous chlorine. The automatic plant to which reference was made has now been installed and has been in operation for some months. The first machine supplied was not entirely satisfactory, but it was redesigned by the suppliers and now operates with great reliability. Chlorine is obtained from drums, each containing 16 cwts. of the liquid. It is drawn off in a gaseous form and passed through a series of automatic reducing valves, whilst the amount of gas is indicated on a recording flowmeter. The required amount of chlorine is adjusted according to the viscose production of the factory and, once the machine has been set, it is rarely necessary to move the control valves as the flow of gas passing to the fume duct remains almost exactly constant. It is reported by the officials of the local authority that complaints are now very seldom received, and these are only of local odours in the immediate vicinity of the factory.

In Glasgow two complaints were received about acid fumes from vitriol works. The first was caused by the exit gases from a sulphuric acid concentrating plant, and steps were immediately taken to reduce the escape to the minimum possible. The other complaint was due to the escape of sulphur dioxide during the charging of pyrites kilns. The works concerned are situated in close proximity to other property, and the gas was finding its way into premises on the other side of the street. In order to prevent this a high screen was erected, which had the effect of raising and dispersing any gas liberated from the kiln doors when these were open.

The average amount of hydrochloric acid discharged to the atmosphere in the residual from chimneys and other final outlets was 0.056 grains per cubic foot, whilst the average acidity was 0.34 grains calculated as sulphur trioxide.

The escape of acid gases from chamber process outlets and chimneys at sulphuric acid works has, in general, been maintained at a satisfactory figure, but on two occasions it was found that the limit of 4 grains per cubic foot of exit gases prescribed by the Act was being exceeded. In neither case was any legal action taken as satisfactory explanations were put forward by the proprietors of the respective plants. One infringement was caused by an error on the part of men operating the process and the other was due to plant alterations being carried out which temporarily upset its smooth working. In both cases steps were immediately taken to rectify the error. The average escape from chamber plants was 0.61 grains of acidity per cubic foot of exit gases expressed as sulphur trioxide. In concentration plants (Class II) the average escape was 0.27 grains. Contact process manufacture has been carried out satisfactorily and the average escape for the year was 1.31 grains.

Superphosphate and Sulphate of Ammonia

One complaint was received during the year against a superphosphate works in Ayrshire when exception was taken by the local authority to acid fumes liberated by the plant. More efficient sprays were installed in the scrubbing tower connected with the process and no further complaint has been received. The removal of acid gases by the various wash towers has been generally very good, the average condensation being 99.51 per cent., whilst the average escape after scrubbing was 0.034 grains of acidity per cubic foot of exit gases expressed as sulphuric trioxide.

A case of infringement of Section 7 (i) of the Act—which provides that the best practicable means shall be taken in all registered factories for the destruction of objectionable gases—was discovered in a factory producing ammonium sulphate. Alterations to this plant had been carried out, and the foul gases from the saturator had been led directly to a chimney without purification. The manager of the works explained that he considered this method to be satisfactory and believed that the objectionable constituents of the gas were being destroyed in the hot chimney flue. Tests on the chimney gases, however, disclosed the presence of hydrogen sulphide and the firm were informed that this method of disposal of foul gas could not be approved.

Zinc Smelting Works

Two works have been registered during the year for zinc extraction. Both of these are employing a process for the recovery of metallic zinc from residues. The method simply consists of heating the residues in a furnace and running out the molten zinc. These two works are the ones previously mentioned as having been discovered operating a registrable process without registration. The first process was brought

to light by a local authority, who requested assistance in dealing with the nuisance arising from this particular plant. On inspection it was apparent that registration was necessary and that infringement of Section 9 (1) of the Act was taking place. It was also apparent that the fumes from the furnace were not receiving proper attention to prevent nuisance to the surrounding district. The question of registration was at once raised with the firm, who explained that they had acted in ignorance and asked permission to submit an application for registration. This application was received by the Department, but registration was not immediately granted, as it was necessary to carry out certain work to condense the fumes from the zinc process in order to mitigate the nuisance in the vicinity of the works. During damp weather the nuisance was particularly bad and the white fumes caused a local fog in the neighbourhood of the factory.

Increased Chimney Height

This process of zinc recovery had actually been carried on by this firm for many years, but the layout of the plant had recently been altered. In the previous plant the gases from the furnace, after passing through an underground expansion chamber, were carried by means of a long duct to the main works chimney where they were discharged to atmosphere mixed with other flue gases. Alteration to the plant necessitated the erection of a small steel stack to deal exclusively with the fumes from the zinc recovery furnace. This, of course, was very much shorter than the previous chimney and also discharged nothing but the zinc fume. It was obvious that this method could not be considered satisfactory, as the fume was discharged at too low level and in too concentrated a form. Suggestions were made to the firm concerned and the first step was the erection of a very much higher chimney. Within the factory alterations were made to reduce to the minimum the amount of fume passed to the chimney. When it was apparent that the steps taken to mitigate the nuisance were reasonably efficient, registration of the process was accepted and the name of the firm added to the register.

International Nickel Co. of Canada

Quarterly Statement

THE International Nickel Company of Canada, Ltd., practically duplicated in the second quarter of this year the net profit made in the first three months, according to the quarterly statement to June 30. The exact figure for the second quarter was $4,963,366 as compared with $5,049,275 in the preceding period. After provision for quarterly dividend on the preferred stock, this profit was therefore again equivalent to the 31 cents a share earned on the common stock in the first quarter. Net profit for the first six months of 1934 was $10,012,642, as compared with $1,862,888 for the first six months of 1933.

The balance sheet reflects purchase of additional shares of Ontario Refining Co., Ltd., and further reduction in the outstanding debenture stock of British subsidiaries, the two transactions involving a total of $5,290,132. Despite these outlays and the payment of two dividends on the common stock aggregating $2,915,633, cash on June 30 was $15,961,243 as against $14,085,610 on December 31, 1933.

In an accompanying letter to stockholders, Mr. Robert C. Stanley, the president, points out that the company has developed processes and refineries to recover metals other than the nickel content of the ore. These by-products have the following order of importance: Copper, platinum metals (platinum, palladium, iridium, ruthenium and rhodium), gold, silver, selenium and tellurium. Second only to Soviet Russia in the production of platinum, Canada is now the world's largest producer of palladium. Discovered and named by Wollaston in 1804, this member of the platinum group has been until recently little known outside the electrical and dental fields. It has been largely through the company's development and research activities that palladium's fine colour and its true resistance to atmospheric tarnish have become recognised, and the metal is now finding new places in the decorative arts.

New Technical Books

THE ADSORPTION OF GASES BY SOLIDS. By S. G. Gregg, B.Sc., Ph.D. pp. 120. Methuen and Co., Ltd. 2s. 6d.

The importance of the interface between a solid and a gas has become increasingly recognised during the past few years, and a large volume of work on the subject has been published. This book attempts to provide a brief but comprehensive summary of the subject up to the present time, full account being taken of recent developments. Special attention is paid to the modern theories of adsorption.

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THE CHEMICAL FORMULARY. Edited by H. Bennett. pp. 595. The Chemical Formulary Co., Brooklyn, N.Y.

This is a handy reference book giving the latest methods and formulæ for the manufacture of hundreds of products used in modern industry. Most of the information requires no technical knowledge and can be readily grasped. To obtain these formulæ it was necessary to obtain the co-operation of a long list of experts in the various fields covered. A perusal of the book indicates that the formulæ submitted are not ancient recipes, but are the latest developments used in their daily work. This book will be of inestimable value when a new problem arises, by enabling one to obtain information quickly. The subjects covered include adhesives, alloys, antiseptics, bleaches, boiler compounds, carbon paper, castings, cleaners, colours, cosmetics, disinfectants, dyes, emulsions, etching, fireproofing, fuels, glazes, insecticides, inks, lacquers, latex, leather, liquors, lubricants, paint, paper, plastics, plating, polishes, preservatives, printing, rubber, sizings, soaps, softeners, solders, solvents, stains, synthetic resins, varnish, viscose, vulcanisation, waterproofing, etc.

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WACHSE, WACHSAHNLICHE STOFFE UND TECHNISCHE WACHSGEMENGE. By Emil J. Fischer. pp. 192. Dresden: Theodor Steinkopff. Rm.14.

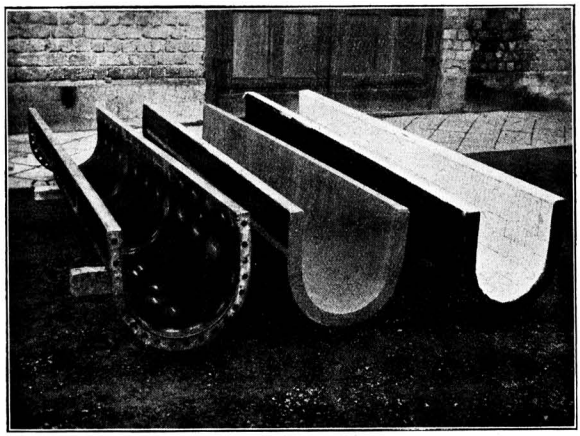
This volume, one of a series of technical progress reports by well-known specialists, is an epitome of recent world patent and periodical literature on all aspects of natural and synthetic waxes (as well as other wax-like substances) and roughly covers the period from 1920 to 1930. In no sense is it a text-book on waxes, nor is it intended to be, but is exclusively aimed at giving a bird's eye view of the published records of work done in this sphere during the decade in question. The properties, refining, analysis, constitution and application of all the more important waxes in the strict chemical meaning of the term and the physically similar substances belonging to other chemical families all come in for brief treatment. In the case of synthetic products, the author does not fail to outline the principal methods of synthesis. No other work of similar scope in such a conveniently small space has hitherto been available in any language. As a time-economising reference work it can be recommended without hesitation to all chemists engaged in this field, who enjoy access to a comprehensive and up-to-date library of technical periodicals and patents.

The Collapse of the Grid

Another Ill-Effect of Rationalisation

READERS of THE CHEMICAL AGE will begin to understand the disastrous collapse of the electricity grid when they read the engineers' report now issued by the Central Electricity Board, every avenue towards elucidating the general failure having been fully explored. "Humanity is suffering in so many ways from the exploration of every avenue and the elucidation of everything by experts, committees and authorities of every sort, kind and description that there will no longer be any wonder at the breakdown of the grid," comments "The Independent." "That the greatest of modern services, represented by the new electrical force, should be subjected to this devastating bureaucratic process of exploring and elucidating avenues is one, perhaps the chief, of the reasons why we come so low down in the list of the nations in our use of electricity." Electricity has, in fact, been rationalised and, like other industries which have suffered that process, it will therefore render less service at more expense.

About two million square feet of flooring have now been laid on the KaBe principle with complete success, giving continued resistence against the action of acid, alkali and oil. These channels, for conveying acid, are lined with KaBe materials, and can be coupled together to form any length required.

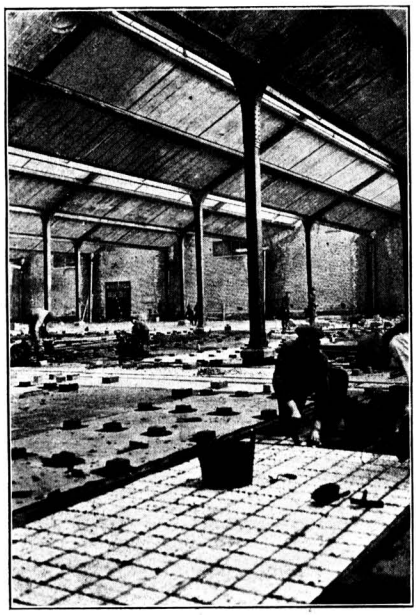


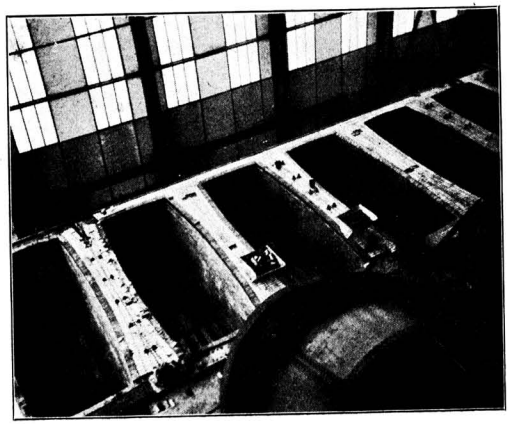
Are Your Floors Acid and Alkali Resisting?

THE necessity exists in most works for the employment of acids and alkalies; as a result such floors are usually subject to the attack of acids or alkalies, alone or in combination. The selection of a suitable floor lining therefore makes it necessary to consider (1) the temperatures of the various liquids employed, (2) their concentration, (3) the amount of abrasive wear to which the floor would be subjected, (4) the change of temperature which occurs when the different liquids are being employed, and (5) the possible chemical combinations of the liquids employed. In addition, a floor lining must be provided which will not crack itself due to expansion or contraction of the concrete floor beneath.

It is quite apparent that no one material employed alone can combine all these properties, and in this respect the KaBe range of products is far superior to other known materials at present on the market, combining as it does over 30 different products each of which have certain different properties and limitations. Very few other materials which are marketed as acid or alkali resisting can combine the requirements set out above, but the fact that many KaBe floors have been laid for periods as long as 7 or 8 years without repair and under the most severe conditions testifies as to the practicability of this method.

With such varied conditions as arise in different industries it is impossible to lay down an exact specification for the construction of a floor lining to meet all needs, but, generally speaking, on the concrete underlayer the following method would be adopted:—(1) The concrete would receive one or two coats of Keragel paint No. 1, which closes the pores of the concrete and forms an effective binder for (2) a layer of adhesive compound hot, in which is bedded (3) special impregnated webbing. On top of this webbing is then laid (4) a jointless protective layer about $\frac{1}{4}$ in. thick (or more in certain circumstances) of Spatula compound. On top of this is placed (5) a layer of KaBe acid, alkali and abrasion resist-



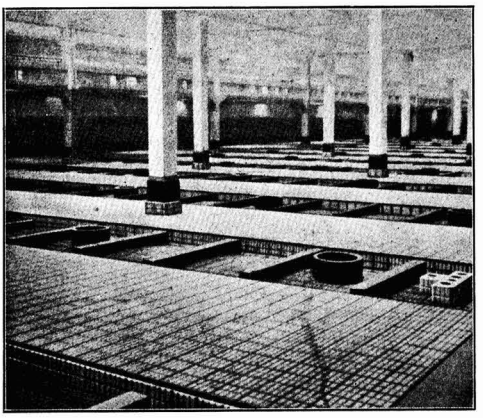


Above: **KaBe acid and alkali resisting flooring in course of being laid.** *Right:* **KaBe products are used in the construction of this copper recovery plant.**

ing flooring tiles bedded and jointed in Spatula compound, or special acid resisting mortars or cements, as the case may necessitate. Such a floor will meet all the requirements set out above and will give years of service without repair or maintenance.

This type of floor has been laid extensively in factories in all parts of Europe and in England, and the fact that repeat orders for further extensions are constantly being received illustrate the satisfaction which users feel. At the present time well over 200,000 square yards of flooring has been laid on this system and many of the original floors are still giving excellent service. The necessity for care in the choice of suitable layers can best be illustrated by the fact that Spatula compound, which is used as an impervious underlayer is made in 7 different grades and the choice of the grade required for any particular floor is a matter requiring considerable knowledge of the conditions which may have to be contended with.

Another aspect of flooring jobs is the necessity for the provision of suitable drainage channels, and these channels must be so constructed that both the channels and the whole of the



This floor with acid resisting tiles set in KaBe jointing compound, was laid by a special system which enables expansion and contraction to be taken up without cracking troubles.

floor are one continuous layer in order to avoid the possibility of leakage at any point. The smallest leakage in the floor or the drainage channel can cause great destruction in the floor itself, and it is therefore desirable to employ men used to the application and properties of the various materials. In the normal way drainage channels can be protected in a similar way to the floors, but as a general rule it is not necessary to employ the tile layer on the top. A similar method can also be adopted for the protection of pits and sumps, etc., although in the case of the latter it is sometimes sufficient to coat these with one of the KaBe range of acid, alkali or oil resisting paints. These paints, four in number, cover the most complete range, and are applicable in all cases where paint films can be usefully employed.

The conditions which have to be contended with food factory floorings often vary considerably from those appertaining in chemical and engineering works. Although as a general rule the liquids used are acid in nature, in many cases grease and hot water has also to be considered. This means the employment of entirely different jointing and bedding compounds for the tiles, as a compound intended for resisting acids and alkalies is in many cases attacked by oils or greases. In such cases the KaBe system of floor linings makes use of a special oil and grease jointing material, which is also at the same time acid resisting.

The KaBe system of flooring has been adopted in many of the largest factories. Apart from its long life and low maintenance the appearance of a KaBe floor is attractive and clean, and the various colours in which the floor tiling can be finished are uniform and lasting throughout the entire life of the floor lining. KaBe materials are supplied in Great Britain and the British Empire by H. Windsor and Co., Ltd.

Special Information Bureaux

Association Conference at Oxford

THE eleventh annual conference of the Association of Special Libraries and Information Bureaux will be held at Somerville College, Oxford, on September 21-24, under the presidency of Sir Richard Gregory.

On September 21, Sir Richard will deliver his presidential address entitled "Science in the Public Press," when the chair will be taken by the past-president, Sir Charles Sherrington. The morning of September 22 will be devoted to a consideration of "Book Selection for Special and General Libraries," when contributions will be made by Mr. A. F. Ridley, "Book Selection for Special Libraries"; Mr. J. E. Walker, "Methods of Selecting Technical and Reference Books for General Libraries"; and Mr. S. G. Wright, "Book Recommendation Methods for University Libraries." Mr. H. V. Horton will also read a paper on "The Use of the Universal Decimal Classification in Photographic Abstracts." The afternoon will be devoted to a consideration of "Some New Libraries," when Mr. Charles Nowell will describe the "Manchester Central Library," and Mr. H. F. Alexander, the "Radcliffe Science Library, Oxford." In the evening, Mr. L. Urwick will read a paper entitled "The Idea of Planning." The morning of September 23 will be devoted to "Planning in its Relation to Information," when the following papers will be read: Mr. K. M. Lindsay, M.P., "Public Efforts at Planning in Great Britain"; and Mr. O. W. Roskill, "The Planning of Industry." In the evening, Mr. L. A. de L. Meredith will discuss "Publicity for Great Britain—The Problem of the Supply of Information."

In addition to members of the Association, the conference is open to others who are interested. Further information can be obtained from the Secretary, 16 Russell Square, London, W.C.1.

Resin and Turpentine

Forest Development Urged in Germany

IT has been frequently suggested, as part of the prevalent policy of national self-sufficiency and independence, that Germany should provide from her own forests for her own needs in resins and turpentine. Of the resins by far the most important is common rosin or colophony which, together with turpentine oil, has been largely imported hitherto from France and the United States. Dr. Asser went very fully into this subject in a paper recently read before the German Chemical Society ("Forben-Ztg.," 1934, *39*, 701). He pointed out that most of the neighbouring countries, especially Poland, Czecho-Slovakia and France, had takan steps to exploit their forest resources.

In 1928 Germany required about 60,000 tons of rosin (colophony) and 15,000 tons of turpentine oil, corresponding to some 80,000 tons of the crude balsam. Dr. Asser stated that German forests are quite capable of yielding these quantities, and much more if the large areas at present covered with stumps and roots from previous cuttings could be properly utilised. Improved methods are now available whereby rosin and turpentine of the highest grade can be obtained from raw material of almost any kind, including the roots and stumps from former forest lands. Dr. Hilf, of Eberswalde, has confirmed the view that German rosins can be produced of the best WW grade. One process, introduced by Dr. Ruhlemann, of Dresden, is claimed to recover about 8 per cent. of resin from various kinds of wood waste by extraction and saponification methods. A still more important advance appears to be the high vacuum process of resin and turpentine production invented by Dr. W. Schultze and developed on a commercial scale by Michael Barthel and Co., G.m.b.H. Chemische Fab., Regensburg, under the name of the Mibaco process. Owing to the low temperature at which it is possible to work, it is claimed for this process that both resins and turpentine, of high purity can be obtained at a competitive cost. In particular, oil of turpentine, owing to the comparatively low working temperature of 30-40°, does not suffer any injury to its rather delicate odour, nor any marked reduction of its pinene content. This latter is of importance in connection with camphor manufacture.

German Chemical Industry, 1933-34

Restriction and Shrinkage of Foreign Trade Becomes a Pressing Anxiety

THE trend of industrial activity in Germany during the twelve months ended June, 1934, is revealed in a report on "Economic Conditions in Germany," by Mr. J. W. F. Thelwall, Commercial Counsellor to the British Embassy at Berlin, recently published by the Department of Overseas Trade (H.M. Stationery Office, 3s. 6d. net). In a prefatory note, the Department records with regret the death of Mr. Thelwall since the compilation of the report. He had a distinguished war service record and his connection with the Department dated from 1919. During his many years' residence in Germany he had acquired an extraordinarily wide and intimate knowledge of the economic system and trade of that country, and he became, in fact, one of the foremost authorities on those subjects. His death in the prime of life (he was 50 years of age) has deprived the Department of a brilliant and devoted member of the Commercial Diplomatic Service, who rendered high services to his country in the course of his duties.

Internal Organisation of the State

Since the previous report was published in June, 1933, the situation in Germany appears to the onlooker to have been one long sequence of ever changing conditions. Politically and economically the principle of leadership and of the totalitarian State has been further extended and consolidated. In matters concerning the financial control of the States and certain matters connected with the Post Office, the railways and transport in general, simplification and uniformity have been obtained through the various Ministries of the Reich and effective power throughout the Reich now centres in the Chancellor. The Cabinet governs autonomously and legislation is frequently enacted so rapidly that a precise knowledge of the situation can only be obtained by following events and circumstances from day to day. Internal organisation and control both politically and economically has been planned on a vast, intricate and strict basis, but on account of its comparatively recent introduction the structure so created is in many ways only a framework which has yet to be filled out.

Aiming at Higher Efficiency

The deflation following the crisis of 1931 has in some respects cleaned up and strengthened the commercial and industrial position in Germany. Debts have been cleared off, costs have been reduced and the beginnings of liquidity have set in, weaker members have passed away and unsound elements have been consolidated. Foreign indebtedness has also been substantially reduced, aided considerably by the depreciation of certain other currencies, and the fact that the service of foreign loans is now endangered is due in some degree to international as well as national reasons; shipping is in a distressed condition on similar grounds, as, indeed, it is elsewhere. Banking is awaiting a reform, shortly to be announced. As regards industry, however, it was in a good position to deal with a gradual improvement, though whether it can stand the pace which has now been set it is another matter. Be that as it may, the injunction which has been laid upon it to spend the majority of its resources in providing work is causing firms to re-equip themselves yet again, after having already done so on an extensive scale with borrowed foreign money during the period 1926-29. This, it is said is not aimed at greater productive capacity, but at yet higher efficiency which, combined with wages and prices kept low by control, would make Germany a redoubtable competitor under better international trading conditions.

A Competitor in the World Markets

If it were only a question of overcoming customs duties Germany, with the help of the subsidies provided by the "additional" export procedure, would already hold a not unfavourable position on the world's markets, except in relation to countries with abnormal facilities, like Japan. The rise in the quantity of Germany's exports to the United Kingdom during the second half of 1933 and the first quarter of 1934, for instance, shows that a tariff together with currency depreciation do not form an insurmountable obstacle to some improvement. One factor, an internal one, operating to Germany's disadvantage is heavy taxation and in view of the large expenditure connected with the promotion of the present revival a reduction does not seem feasible for some time. As matters are she, in conjunction with her competitors, is faced by other more formidable external barriers, the chief of which are quota and exchange restrictions. In addition, Germany has another opposition to contend with, which is due to the idealistic conception which she has introduced into commercial matters; it has naturally produced in a number of other countries a counter-movement also based on ideals and sentiments which is detrimental to German foreign trade. The times are past when mere cheapness was enough to ensure sales; on the contrary, the appearance of low priced goods is nowadays the signal for the introduction of special safeguards to prevent their entry.

The restriction and shrinkage of foreign trade is Germany's most pressing anxiety. It has brought her face to face with serious exchange difficulties, not only as regards her note cover, which control has deprived it of much of its practical importance, but also in relation to her foreign indebtedness and to her supply of raw materials; she can help herself to some extent by the conclusion of bi-lateral commercial treaties and by the use of various forms of cheap marks, but these cannot be more than palliatives, for an effective remedy she is dependent upon others. There are, in particular, two internal dangers which this state of affairs creates. One is that her large and efficient industrial apparatus running at high speed absolutely needs an outlet beyond the home market if it is not to be choked with its own products and the other that if some means of financing raw material imports cannot be found the machine will run down for want of fuel and the whole scheme for the provision of work which has been built up with so much care, energy, devotion and sacrifice will be jeopardised.

Prospects of Foreign Trade

From the foregoing it will be seen that the prospects for Germany's foreign trade in 1934 are unfavourable. By her special agricultural measures she has probably reduced her import of foodstuffs to a minimum and while there is, therefore, no likelihood of an increase in their volume, prices will probably rise and burden the trade balance. This applies with even greater force to raw material prices, but here Germany's requirements will, in addition, go up if she is to maintain her growing internal activity and the balance of trade will thus be yet further adversely affected. As regards Germany's exports the bulk of which consists of finished goods, they will be difficult to keep up, let alone to be increased, either in volume or value for the reasons set out above. Already in January and February, 1934, there were adverse balances of RM.22 and 35 million respectively due to larger raw material imports.

German exports to the United Kingdom amounted to 405 million marks in 1933 compared with 446 million marks in 1932 (−9 per cent.), and German imports from the United Kingdom to 238 as against 258 million marks (−8 per cent.). Germany thus still has a favourable balance of RM.167 million. The value of most German goods sent to the United Kingdom decreased in 1933 compared with 1932, but there were some important exceptions. On the other hand, exports from the United Kingdom to Germany of chemicals and of animal fats and fish oils increased in value. Germany bought from the United Kingdom 2,101,520 tons of coal of a value of 25.7 million marks in 1933 compared with 2,222,169 tons of a value of 28.2 million marks in 1932.

Production in the German cement industry was estimated at RM.140 million in 1933, compared with RM.100 million in 1932 and sales amounted to 3.5 million and 2.8 million tons.

The level of employment in 1933, although about 20 per cent. higher than in the preceding year, was still only 50 per cent. of capacity. Sales in January and February, 1934, were more than double the quantity in the same months of 1933. The foreign market has become of less importance in the past few years and the proportion of total production sold abroad has diminished from 15 per cent. a few years ago to 9 per cent. in 1933. Export prices have also fallen by about 60 per cent. since 1929. Exports in the past year were 237,540 tons, as against 311,050 tons in 1932; Holland took 60 per cent. of these exports. The struggle between the various cement syndicates and outsider firms which had undermined the market for many years, was terminated by the Minister for Economic Affairs, who decreed that the prices and terms of delivery fixed by syndicates for their respective districts must be adhered to by non-members with effect from March 1, 1934. A special court was established to control the maintenance of prices. The transfer of sales quotas was made subject to the approval of the Ministry. The decree, which is provisionally valid until December 31, 1934, prohibits the opening of new cement works or the extension of existing capacity until that date.

The German Dye Trust

The annual report of the German Dye Trust (I.G. Farbenindustrie) for 1933, emphasised the improvement in the home market, together with the efforts made by the concern to create employment in its mines by hydrogenation of lignite, by modernisation of plant and by additional building of workers' dwellings. On the other hand, foreign trade diminished in spite of the large barter transactions carried out by the trust with other countries in North-East and South-East Europe owing to new import restrictions and price cutting elsewhere.

Sales of dyestuffs were maintained not only at home, but also in several European countries; agreements with other groups of producers worked satisfactorily and were in some cases extended, particularly by arrangements in respect to the Far Eastern market. The German demand for chemicals was higher than in 1932; sales abroad were affected by keen competition and further import restrictions. Pharmaceuticals and insecticides underwent a marked revival at home, but exports suffered especially owing to the depreciation of currencies in the best markets for these products. Sales of perfumes developed favourably, though prices fell and the overseas demand showed a downward tendency. The turnover in photographic materials was satisfactory, but requirements of cinematograph films were restricted by the dull position of the film industry and import quotas fixed by France; prices abroad dropped considerably. The quantity of rayon sold showed a favourable development; the fall in prices due to competition and the collapse of other textile raw material markets was counterbalanced by technical progress; sales of viscose were higher at home and abroad. The improvement in sales of nitrogen fertilisers was solely in the home market; the demand for nitrogen for technical purposes was somewhat higher.

Production of Synthetic Petrol

The most important development of the trust was the extension of the Leuna works for the production of synthetic petrol. Technical progress was reported in the direct catalytic hydrogenation of lignite, as well as in experiments with coal hydrogenation and the production of lubricating oils.

About 5,000 additional employees were engaged in the first two months of 1934, although 90 per cent. of the staff were stated to be working only from 40 to 42 hours a week. Gross profits improved from RM.476 million in 1932 to RM.491 million last year. Wages rose from RM.173 to RM.175 million. Depreciation required RM.57 million, as against RM.54 million a year ago. Tax certificates were the chief factor in a special item of over RM.8 million on the profit side. Interest on loans dropped from RM.15 million to RM.11 million, mainly due to the re-purchase of RM.73 million of the firm's own bonds during the year. The net profit for 1933 was RM.49 million, compared with RM.47 million in 1932. A dividend of 7 per cent. will again be paid. Stocks were RM.28 million higher than twelve months ago. The general meeting will be asked to approve the cancellation of RM.130 million ordinary and RM.90 million preference shares, and to agree to raise the capital by RM.177 million in order to cover the liquidation of option rights in associated industries.

The Nitrogen Syndicate

Sales of the German Nitrogen Syndicate, which comprises 98 per cent. of total production, amounted to 351,000 tons in 1932/33, compared with 325,000 tons in 1931/32, 360,000 tons in 1930/31 and 410,000 tons in 1929/30. Sales during the period July, 1933, to February, 1934, were considerably higher than in the preceding year. Prices for some kinds of fertilisers were reduced by 7 per cent. as from July, 1933. Exports of nitrogen fertilisers dropped from 591,000 tons valued at RM.64.5 million in 1932 to 557,000 tons valued at RM.46.5 million last year. The differences between German manufacturers of nitrogen were temporarily overcome by the entry of the last outsider firms into the syndicate, but the claims of certain members to expand their output could only be settled by a definite order of the Minister for Economic Affairs in January, 1934, prohibiting the installation or extension of nitrogen plant until 1940. The Government also undertook the control of prices of nitrogen fertilisers.

Coke oven undertakings within the German Ammonia Sales Association also joined the Nitrogen Syndicate in 1933 and were allowed a quota beyond the limits of other members in consideration of paying a levy for this excess quantity. The total output of nitrogen by cokeries in 1933 was given as 55,000 tons. The dispute between Germany and Chile was settled by an agreement signed in January, 1934, which provided for the import into Germany of 106,000 tons of saltpetre from Chile up to June 30, 1934. An additional quota of 24,000 tons might be granted against the placing of orders by Chile in Germany to a corresponding value. Sales of this saltpetre were to be carried out at the prices and terms fixed by the German Nitrogen Syndicate.

Sales of Potash

Sales of the German Potash Syndicate improved from 850,000 tons in 1932 to 940,000 tons in 1933. Home sales rose from 640,000 tons to 720,000 tons. Potash orders from German agriculture in the first three months of 1934 were 20 per cent. higher than in the corresponding period of 1933.

A new Potash Law was passed in December, 1933, which made various alterations in the organisation of this industry. The participation quotas in the syndicate, which remains a compulsory cartel for all producers, have been fixed until 1953. It is forbidden to open up new shafts in the meantime. Instead of the former Potash Council, two new departments were formed, known as the "Potash Control Office" and the "Agricultural and Technical Potash Office." The objects of this change were stated to be to place the industrial organisation on a National Socialist basis and to give agriculture more influence in the fixing of potash prices. The Ministry for Economic Affairs was empowered to confirm appointments in the syndicate and to intervene to prevent any abuse of power by a majority of members.

With a view to creating better conditions in the German salt market, the Minister for Economic Affairs decided in January, 1934, to affiliate temporarily all producers to the Rock Salt Syndicate or the Association of Salines. As a voluntary agreement could not be reached among the firms concerned, the Minister subsequently made all outsider firms members of existing organisations and issued a decree forbidding the installation or extension of plant for the production of salt until the end of 1938. The basis of the present arrangements is that 56 per cent. of the home market be allotted to salines and 44 per cent. to rock salt producers; salt for indusrial purposes and for export is not affected.

Mineral Oil Industry

The output of oil boring companies in Prussia was 232,689 tons in 1933 or 19,000 tons more than in the previous year. Figures for Thuringia are not available; the output of Burbach, Volkenroda, Thuringia, which dropped to 16,000 tons in 1932, was understood to be only 8,000 tons in 1933. There was considerable activity in the oil boring industry early in 1934, particularly in the Nienhagen district, near Hanover. The Internationale Tiefbohr A.G., in which "Deutsche Erdöl A.G." and "Deutsche Petroleum A.G."

are interested, succeeded in boring a well to a depth of over a thousand metres, which commenced with a daily production of 200 tons, the most successful recent strike. The German Company for Public Works created a provisional fund of RM.5 million, which was to be used for grants of credit in support of pioneer work in oil-boring. Applicants were required to find 50 per cent. of the working expenses involved.

The possibility of making Germany less dependent upon foreign supplies of motor spirit was one of the outstanding proposals repeatedly made during the past twelve months. Owing to the Government policy of stimulating motorisation, the country will become more dependent upon imports unless German production of motor spirit is increased. The Government of Saxony decided upon the erection of a plant at the Böhlen Lignite Mines in October, 1933, to produce 20,000 tons of petrol per annum. The most important schemes under discussion were that of the German Dye Trust to increase output at Leuna from 100,000 tons to 350,000 tons of petrol per annum from lignite and another of the Ruhr Coal mines to employ the unused capacity of their synthetic ammonia plants for the production of motor spirit, which would furnish about 200,000 tons of petrol per annum. The Leuna works and associated lignite mines were stated to have taken on 3,100 additional hands in February, 1934; the employment of additional workers was reported to be under consideration in March. The German Government were arranging that all extra production of motor spirit due to this expansion should be marketed through existing oil distributing organisations.

Coke Production

The development of coke production was by no means uniform throughout Germany. The Ruhr district, which provides over 80 per cent. of the total, increased its output from 15.4 million tons in 1932 to 16.8 million tons last year. The average number of coke ovens in commission in the Ruhr was 6,770, or slightly more than in 1932, but they were not utilised to full capacity. In December, 1933, the figure had risen to 6,913 ovens. The Aachen district also increased its coke output from 1.3 million tons to 1.4 million tons, and there was an improvement from 788,000 tons to 825,000 tons in Lower Silesia. On the other hand, production in Upper Silesia dropped from 867,000 tons in 1932 to 860,000 tons last year, which is about 50 per cent. of the quantity produced in 1929. The coke output in Saxony and in other districts declined still further. Total production for the whole of Germany was 20,714,000 tons, compared with 19,546,000 tons in 1932.

It was reported in April, 1934, that the production of sulphuric acid in the Ruhr district was to be increased. A member of the Ammonia Syndicate re-opened their works, which had been closed for years, on May 1; the output will be 50,000 tons per annum, or one-third of capacity. Another member firm will raise their production of sulphuric acid from 90,000 tons to 130,000 tons per annum.

Sales of gas by the Ruhrgas A.G., Essen, increased from 843.3 million cubic metres in 1932 to 1,076.5 million cubic metres in 1933. During the first quarter of the current year there was a further rise of 30 per cent. to 330 million cubic metres, as against 250 million cubic metres for the corresponding period of 1933. Out of the total German production of 12,000 tons of sulphur in 1933, the Ruhrgas A.G. furnished 7,088 tons.

Rayon Developments

Developments within the German rayon industry varied during 1933 and at the end of the year it was difficult to see what further steps might be taken to give home producers more control of the inland market. During the first few months of the year sales and output declined, in some cases to 40 per cent. of capacity. In August the Minister for Economic Affairs gave members of the Rayon Syndicate the right to terminate the syndicate agreement without notice in order to arrive at more satisfactory arrangements in the German market. Discussions with foreign members were, however, unsuccessful and imports of other outsiders, particularly of Japanese manufacturers, were alleged to be advancing rapidly, so that very high figures were reached in September. Finally, in December, the Minister decided to make rayon yarns subject to import licences. Import quotas were allotted on the basis of 75 per cent. of the quantity imported in 1931. Large stocks were stated to have been imported by foreign manufacturers in anticipation of this measure. An arbitrator was appointed by the Minister in January, 1934, to assist the syndicate in regulating conditions in the home market; it was expected that German firms would claim a greater proportion of sales within the country.

Although rayon output during the first six months of 1933 was lower than in the same period of the preceding year, total production for the whole year was estimated to have expanded from 27 million kgs. in 1932 to 29 million kgs. in 1933. Imports of rayon yarns in 1933 amounted to 10.26 million kgs. valued at RM.40.2 million, compared with 10.17 million kgs. valued at RM.43.7 million in 1932. Exports of rayon yarns rose from 6.8 million kgs. valued at RM.30 million in 1932 to 7.5 million kgs. with a value of RM.27.96 million in 1933. Sales of the German Rayon Syndicate in January, 1934, constituted a record. The Vereinigte Glanzstoff-Fabriken again took into commission a factory at Elsterberg with over a thousand hands in 1933, and were reported to be considering the introduction of Sunday shifts in April, 1934, in order to cope with the heavy demand. The same concern reported that the volume of their turnover had been increased in 1933, but that competition at home and customs duties and currency depreciation of foreign countries had prevented any corresponding rise in the value of sales. No dividend was paid. Bemberg described the business year 1933 as satisfactory. Sales in the second half improved substantially, although there was a decline towards the end of the year.

The Catalytic Oxidation of Acetaldehyde

By ALVIN ACKERMAN BURTON

An abstract of a thesis submitted in partial fulfilment of the requirements for the Degree of Doctor of Philosophy in Chemistry in the Graduate School of the University of Illinois, 1934.

THE carbonyl compounds are widely used in industry, so any data concerning their reactions are interesting. In particular, the oxidation of acetaldehyde itself is of significance due to the economic importance of acetic acid. Also, since acetaldehyde is the intermediate oxidation product in the conversion of ethyl alcohol to acetic acid, the present investigation should be of value in the study of the alcohol oxidation. In the study of catalysts attention was almost entirely concentrated on the gel type and particularly on the newly developed aërogels.[1] The gel type was advantageous due to its extreme porosity and consequent greatly increased surface.

The reaction between acetaldehyde and oxygen results in the formation of the unstable peracetic acid. This either decomposes to acetic acid and oxygen or combines with another molecule of acetaldehyde to form acetic acid. Thus acetic acid is the final product formed. One of the chief functions of a catalyst is the lowering of reaction temperature. This results not only in decreasing decomposition of the organic molecules but also in an exothermic reaction in shifting the equilibrium towards a greater per cent. combination. Adsorption is of importance in all heterogeneous catalysis and in this case plays a very prominent role. The

(1) Kistler, S. S., J. Phys. Chem. (1932) **36**, 52. Kistler, S. S., Swann, S., and Appel, A. G., Ind. Eng. Chem., (1934) **26**, 388.

acetaldehyde may be considered as being compressed to a thin layer on the catalyst surface, and the catalytic effect achieved by this greatly increased concentration.

The acetaldehyde was vapourised into an air stream, the mixture then passed over the heated catalyst, and the products condensed in traps. The catalyst chamber consisted of two vertical, concentric, Pyrex tubes with the catalyst packed in the annular space. The acetaldehyde used was freshly distilled from paraldehyde in an atmosphere of nitrogen previous to each run. Effluent gases were analysed for acetaldehyde and carbon dioxide in an Orsat apparatus; liquid products were analysed for acetaldehyde and acetic acid by titration.

Among the non-gel catalysts tested were metallic copper, charcoal, aluminium, platinum on pumice, and vanadium on pumice. They were all inactive at low temperatures and produced more carbon dioxide than acetic acid at higher temperatures. Conversions ranged from 1 per cent. to 9 per cent.

Catalyst Fouling

It was expected that a specific oxidising catalyst could be found that would be active enough to cause a high rate of reaction at low temperatures. To this end a series of metal oxide aërogels were tested, including: alumina, thoria, alpha-stannic oxide, titania, and a nickel gel. Without exception, side reactions were induced resulting in highly odourous products and catalyst fouling. The conversions were negligible at 100° C., and at higher temperatures catalyst fouling was so severe that only indifferent yields were possible. The strongly adsorbent silica aërogel gave only a mediocre conversion at the higher temperatures, but at the optimum temperature of 90° a conversion of 24 per cent. was obtained. There was no catalyst fouling at the low temperature, and enough heat was generated by the reaction to maintain the catalyst at the operating temperature. When calculated on the basis of the acetaldehyde actually reacting, a value of over 90 per cent. was obtained for the conversion.

The amount of air customarily employed was only a slight excess over that actually used in the reaction. With a larger excess of air a conversion of 37 per cent. was obtained, but the amount of acetaldehyde going to carbon dioxide increased materially.

The much denser silica xerogel (commercial silica gel) tested at 90° C. gave results practically identical with those of the silica aërogel. As this is undoubtedly a surface reaction, it would appear that the amount of active surface in the two gel types is of the same order.

Activity of Impregnated Gels

On the assumption that what was being dealt with was essentially a liquid film on the catalyst surface, manganese salts were deposited on the silica aërogel with the expectation of further catalysing the reaction. Instead of improving the catalyst, however, it was found that even the original activity of the silica gel had been destroyed. A number of other materials, such as chromium oxide, cupric oxide, tungstic oxide, platinum, and vanadium, were impregnated on silica gel but were all found to destroy its activity. However, in the cases of 19 per cent. alumina on silica aërogel and 8.8 per cent. nickel tartrate on silica aërogel the original activity of the silica gel was retained.

The reason for the activity of some impregnated gels and inactivity of others was given by X-ray studies. The inactive impregnated gels were shown to be definitely crystalline while the active ones were definitely amorphous. Thus the impregnated material which did not diminish activity presented the same type of amorphous surface as silica gel itself, while the other materials covered the active portion of the silica gel with an inactive, non-adsorptive layer.

A sample of silica xerogel was especially purified to remove sodium ions. This gave the unexpected result of fouling even below 90° C. This indicated that sodium ions inhibit the side reactions, so the sample of purified silica xerogel was soaked in a weak sodium nitrate solution and again tested. Fouling was greatly reduced and the conversion increased to 35 per cent. Silica aërogel when specially purified showed a greater tendency to foul than did the untreated samples.

German Dyes and Intermediates

A Survey of World Distribution

FOR some years German dye and intermediate exports have been distributed about equally between European and overseas countries, but within the last five years the trade with Europe has held up better than that in overseas countries, so that the share of the total trade absorbed by European markets rose somewhat, or from 54 to 56 per cent. Within Europe, the most important group of markets are the western European countries, taking one-third of the total exports to European countries; followed by south eastern Europe, which takes only slightly less. Southern Europe (including Switzerland) accounts for 22 per cent. of the exports to Europe, followed by north European countries, 6 per cent., and eastern Europe, 4 per cent. There has been a notable shifting in trade in south eastern Europe, characterised chiefly by the diminished importance of Czechoslovakia as a market and the steady increase in importance of Balkan countries consequent upon the development of their domestic textile industries. In eastern Europe, sales to the Baltic States as a whole have increased steadily, while exports to Russia and Poland, in keeping with the developing dye production in those countries, have steadily diminished.

In the overseas trade, the densely populated Asiatic countries continue to be the most important sales areas, although exports to North and South America have shown notable expansion in recent times. Africa and Australia are relatively unimportant as markets for these products. The share of Asiatic markets in the total German overseas dye trade was somewhat smaller in 1933 than in 1929, but nevertheless was around 60 per cent. On the other hand, the share of the Americas increased considerably (from 30 to 40 per cent.) largely on account of the increased importance of Latin American countries, whose textile industries have expanded considerably in the last few years.

Lead and Zinc Pigments

Trade Statistics for the United States

SALES of all lead pigments and of all zinc pigments and salts in the United States registered important increases in 1933, the range being from 5 per cent. for litharge to 60 per cent. for leaded zinc oxide. All pigments and salts decreased sharply in 1932, following decreases in all pigments and salts, except leaded zinc oxide and zinc chloride, in 1931.

The increases in sales of lead pigments in comparison with 1932 were as follows: basic lead sulphate, 27 per cent.; red lead, 16 per cent.; white lead (dry and in oil) and orange mineral, 9 per cent. each; and litharge, 5 per cent. Sales of zinc pigments and salts in comparison with 1932 showed the following increases: leaded zinc oxide, 60 per cent.; zinc oxide, 36 per cent.; lithopone, 16 per cent.; zinc chloride, 37 per cent. and zinc sulphate, 34 per cent. The average values for all lead pigments, as reported by producers, showed improvement in 1933, while those for all zinc pigments were lower. Despite this showing sales of zinc pigments increased proportionately more than those of lead pigments. The lithopone producers report an annual production capacity of 233,000 tons.

Imports of lead pigments were negligible. Exports of white lead dropped from 1,681 tons in 1932 to 1,048 tons in 1933, while exports of red lead increased from 493 tons to 570 tons, and of litharge increased from 1,493 tons to 1,538 tons. Imports of zinc oxide declined from 2,672 tons in 1932 to 2,541 tons in 1933, while imports of lithopone increased from 4,724 tons to 5,096 tons and of zinc sulphide dropped from 33 to 11 tons. Imports of zinc chloride increased from 251 tons to 556 tons and imports of zinc sulphate dropped from 131 to 84 tons. Exports of zinc oxide declined from 1,261 tons in 1932 to 722 tons in 1933 following successive drops from a high record of 17,638 tons exported in 1929. Lithopone exports dropped from 3,212 tons in 1932 to 1,186 tons in 1933.

Determination of Viscosity

A Direct-Reading Instrument

FROM the discussion on the viscosity-temperature characteristics of mineral oil which arose at the recent summer meeting of the Institution of Petroleum Technologists, as reported in THE CHEMICAL AGE, August 4, page 102, it appears that there is a general consensus of opinion that viscosity ought to be given in C.G.S. units, and that the majority were in favour of kinematic viscosity units or poise/density as the standard. There was, however, as yet no *practical* apparatus for determining absolute viscosities.

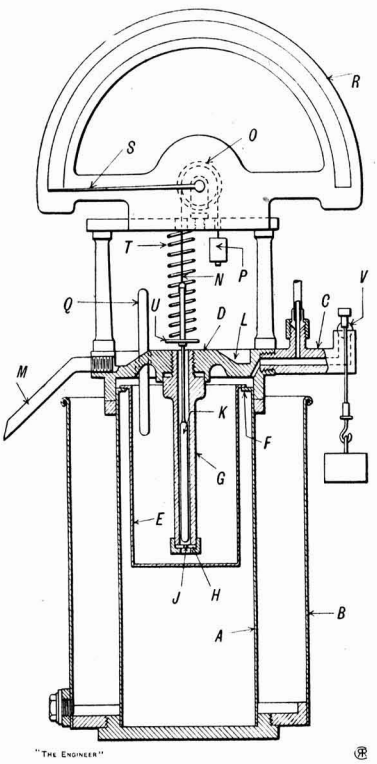


Fig. 1. Rhodin's Viscometer: Details of construction.

In this connection there appears in "The Engineer," July 27, a description of a direct-reading viscometer designed by Mr. John G. A. Rhodin, F.I.C., which gives readings under specified conditions almost directly proportional to the poise. Mr. Rhodin arrived at this design after having tried various designs of capillary flow absolute viscometers with or without automatic temperature-regulation at various times right back to 1904. He then experimented with the determination of the viscous drag or displacement effort exerted by the constant velocity flow of a liquid on a piston of slightly smaller diameter than the cylinder in which it was mobile. As the piston had to be totally immersed so as

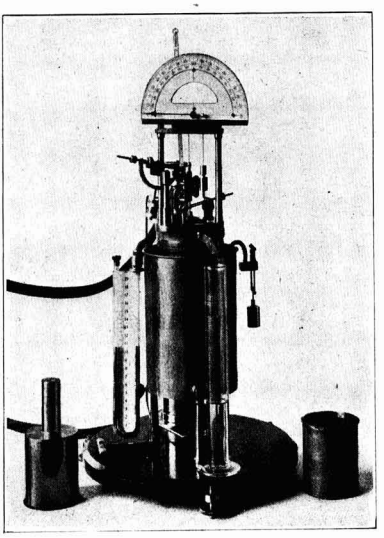


Fig. 2. Rhodin's Viscometer: The complete instrument.

to avoid correction for the diminished surface, he decided on a totally immersed cylindrical body with spherical ends, such as used by Bridgman for determining the velocity of fall. The constant flow was obtained by admitting the liquid under test to the cylinder or barrel through a small hole in a thin diaphragm and exerting a constant air pressure on the free surface. Constancy of air pressure was obtained by a release valve, consisting of a steel ball resting on a spherical seating and loaded by weights to the desired pressure.

This form of release valve was found to act with almost incredible accuracy, as long as the air-pressure was adjusted till the valve just started "floating." Fig. 1 is a reproduction of one of the patent drawings. A cylindrical air-pressure

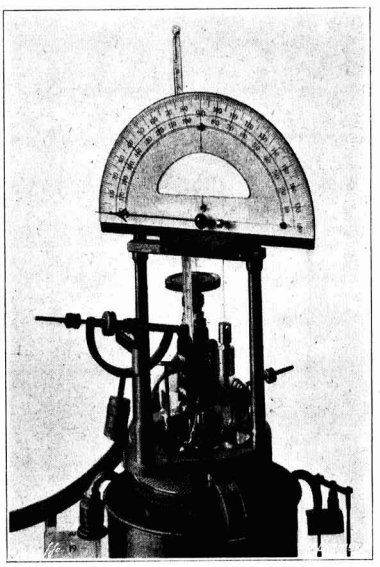


Fig. 3. Rhodin's Viscometer: Indicating Mechanism.

vessel (A) is surrounded by a water-jacket (B), both being made of copper or brass, (A) preferably of copper to ensure easy heat transference. Vessel (A) is closed at the top by a cast lid (D), which can be clamped on (A) to hermetically close the same. Inside (A) the oil vessel (E) is hung on a ledge (F) the supporting flange being nicked to provide passages for the air. From (D) protrude downwards the viscometer barrel (G) and the thermometer (K). An indicating movement consisting of a graduated arc (R) and a pulley (O) and pointer actuated by a cord and balancing weight (P) on one side, and the Bridgman body on the other, the movement of which is taken up by the spring (N), the pointer (S) indicating the compression in grams. Air-pressure is applied at (C) from an intermediary air reservoir, provided with a needle-valve. At (V) is the release valve described above. The diaphragm holder (H) with the hole (J) is screwed on at the bottom of the barrel (G). The oil flows over at the top on a flat, polished surface, and leaves at a slightly lower level through the tube (M). Both barrel and Bridgman body are made from invar to avoid temperature corrections. In the instrument for absolute mensuration a gravity control balance is employed instead of a spring. The zero-point is adjusted with the Bridgman body immersed in distilled water or oil of suitable density. The density of the liquid under test does not affect the readings of the instrument apart from the zero-point and the small back-pressure, which are both easily corrected for.

The advantages of this instrument are claimed to be fivefold. In the first case it gives practically instantaneous readings. Secondly, as the indicating movement can be lifted off after releasing the Bridgman body by actuating a spring clip, the barrel, oil-vessel and stirrer, etc., can be rapidly cleaned in a vapour degreaser and a fresh test made within 10 minutes. Thirdly, any careful person can operate the instrument without specialised knowledge. Fourthly, a special arrangement can be provided for putting back the tested liquid after each reading without disturbing anything, when taking viscosity-temperature curves. Lastly, the instrument can be made self-recording.

Mr. Rhodin is collecting data for an exhaustive paper on the theory of the instrument which can be modified to suit any purpose by changing barrel, diaphragm or Bridgman body, an operation which can be effected in a quarter of an hour. In the chemical industry it should be suitable for various kinds of works control. There are, as is well known, many processes like the manufacture of glycerine, various kinds of beers, solvents, solutions in oils, etc., where the viscosity of the product determines its usefulness. No doubt the lack of a thoroughly practical instrument has militated against the adoption of viscometry and it is thought that the advent of the instrument described will meet a long-felt requirement.

Analysis by "Spot" Tests

An Outfit Complete with Reagents

A THIRD and enlarged edition of "The B.D.H. Book of Reagents for 'Spot' Tests and Delicate Analysis," which contains particulars of the uses of sixty reagents, has just been published by The British Drug Houses, Ltd., price 2s. 6d. The large demand for the two earlier editions of the book is indicative of the interest taken in the technique of this relatively new branch of analytical chemistry.

It was by the work of Feigl and others, that progress has been stimulated in the application of "spot" tests to microchemical analysis, whereby it is frequently possible to establish directly the presence of a metal without the necessity for conducting a preliminary separation. The literature describing methods of "spot" test analysis is extensive and is somewhat inconveniently distributed in various scientific journals, many of which are difficult to obtain, hence the publication of "The B.D.H. Book of 'Spot' Tests and Delicate Analysis" with details of the use of the more important reagents, and references to the original papers from which the information has been derived.

In order to still further promote the use of these tests the B.D.H. "Spot" Test Outfit has been introduced. This provides chemists with a handy collection of twenty-seven reagents and the apparatus required for their use. It is hoped that the outfit will prove to be of particular value to analytical chemists, and to all those who are engaged in schools and colleges, and desire to demonstrate the technique of this new branch of analytical chemistry.

The tests which can be applied by means of organic reagents are of four types:—(*a*) Production of "spot" colorations on absorbent paper or porcelain tiles; (*b*) Formation of micro-crystals, the characteristics of which can be observed under a microscope; (*c*) Development of colours in solution; (*d*) Precipitation of insoluble compounds which can be subsequently identified or weighed. The tests belonging to types (*a*) and (*b*) are qualitative only, but it is frequently possible to apply those classified as types (*c*) and (*d*) to quantitative measurements. The reagents which react to form colorations in solution are especially useful and have greatly extended the possibilities of colorimetric micro-analysis.

With many of the reagents the technique can be varied so widely that tests can be conducted by methods referable to two or more of the above types according to the immediate requirements of the analyst. Thus the reagent for cobalt, α-nitroso-β-naphthol, can be used as a delicate "spot" test or employed for gravimetric determinations. Again, diphenylcarbazide is applicable for the detection of chromium by means of the "spot" test method, or for its colourimetric determination. In connection with microchemical determinations depending upon the measurement of colour intensities, work is often facilitated by using a Lovibond tintometer.

Institution of the Rubber Industry

Papers on Rubber Latex in Industry

IN view of the increasing use of rubber latex in industries outside the rubber industry, the Council of the Institution of the Rubber Industry has decided to arrange a special programme of papers which will be of interest to such industries. The following meetings are being held by the London, Manchester and Midland Sections: —

"Production, Distribution and General Properties of Latex," by Mr. G. Martin, B.Sc., A.I.C., F.I.R.I., London Advisory Committee for Rubber Research, October 9, at the Institution of Mechanical Engineers, Storey's Gate, London.

"Latex Supplies," by Mr. F. D. Ascoli, C.I.E., managing director, Dunlop Plantations, October 11, at the James Watt Memorial Institute, Great Charles Street, Birmingham.

"Special Properties of Latex," by Mr. F. H. Cotton, M.Sc., A.I.C., A.I.R.I.(Sc.), lecturer, Northern Polytechnic Rubber Trade School, November 26, at the Institution of Mechanical Engineers, Storey's Gate, London, S.W.1.

"The Physico-Chemical Properties of Latex and their Significance in Manufacture," by Mr. E. W. Madge, B.Sc., February 18, 1935, at the Engineers' Club, Albert Square, Manchester.

"The Coating and Impregnation of Fabrics and Textiles by Latex," by Mr. H. P. Stevens, M.A., Ph.D., F.I.C., F.I.R.I., and Mr. W. H. Stevens, A.R.C.S. (Lond.), February 27, 1935, at the Institution of Mechanical Engineers, Storey's Gate, London, S.W.1.

"Latex in the Boot and Shoe Industry," by Mr. H. Bradley, D.I.C., A.R.C.Sc., B.Sc., director of research, British Boot, Shoe and Allied Industries Research Association, March 26, 1935, at the Institution of Mechanical Engineers, Storey's Gate, London, S.W.1.

Non-members of the Institution of the Rubber Industry wishing to attend these meetings should apply for tickets of admission to Mr. F. H. Cotton, The Northern Polytechnic, Holloway, N.; Mr. N. Lister, J. Mandleberg and Co., Ltd., Seaford Road Works, Pendleton, Manchester; or Mr. D. B. Collett, Fort Dunlop, Birmingham.

THE Czechoslovak paint and varnish industry now comprises 50 manufacturers, practically all of whom are turning out a complete line of lacquers, with the possible exception of some special grades. A high duty and import restrictions on lacquers and solvents have severely curtailed imports, which in 1933 amounted to only 46 tons, of which 17 tons were from Germany, 12 tons from Great Britain, and only 4 tons from the United States.

British Overseas Chemical Trade in July

Exports and Imports Increase

THE Board of Trade returns for the month ended July 31 show that exports of chemicals, drugs, dyes, and colours were valued at £1,552,315, as compared with £1,447,158 for July, 1933, an increase of £105,157. Imports were valued at £909,306, as compared with £778,362 for July, 1933; re-exports were £36,953.

	Quantities. July 31, 1933.	Quantities. July 31, 1934.	Value. July 31, 1933. £	Value. July 31, 1934. £
Imports				
Acids—				
Acetic .. .. cwt.	14,611	17,282	23,356	29,016
Boric (boracic) ,,	2,080	1,520	1,990	1,562
Citric .. .. ,,	1,231	900	3,936	2,554
Tartaric .. ,,	4,400	3,805	16,930	16,117
All other sorts .. value	—	—	9,636	9,793
Calcium carbide .. cwt.	33,668	72,497	21,040	39,068
Potassium compounds—				
Caustic and lyes ,,	8,880	11,950	9,869	12,763
Chloride (muriate) ,,	47,240	23,454	19,589	9,634
Kainite and other mineral fertiliser salts ,,	5,400	12,400	1,161	3,777
Nitrate (saltpetre) ,,	5,627	1,818	4,918	2,023
Sulphate .. ,,	45,820	15,042	21,874	6,571
All other compounds ,,	9,438	10,479	14,187	16,967
Sodium compounds—				
Carbonate, including crystals, ash and bicarbonate .. cwt.	11,270	10,066	4,047	3,042
Chromate and bichromate .. .. cwt.	5,277	4,874	7,350	7,034
Cyanide .. ,,	—	1,646	—	3,759
Nitrate .. .. ,,	20	500	22	106
All other compounds ,,	16,018	13,513	15,494	13,831
Other chemical manufactures .. .. value	—	—	239,921	211,751
Drugs, medicines, etc.—				
Quinine and quinine salts oz.	64,316	47,432	4,895	4,437
Medicinal oils .. cwt.	938	1,115	1,900	2,250
Ointments and liniments cwt.	15	8	300	690
Proprietary medicines	—	—	27,521	38,867
Other manufactured sorts .. .. value	—	—	60,623	51,381
Raw or simply prepared	—	—	28,854	33,339
Finished dyestuffs (coal tar) .. .. cwt.	3,212	4,050	69,566	116,973
Extracts for tanning—				
Chestnut .. cwt.	28,478	23,724	19,061	16,055
Quebracho .. ,,	36,273	32,243	21,285	19,716
All other sorts .. ,,	18,624	24,311	15,295	15,960
All other dyes and dyestuffs, etc. .. cwt.	4,648	6,191	13,335	42,160
Painters' colours and materials—				
White lead, basic carbonate .. .. cwt.	7,375	7,962	8,917	9,366
Lithopone .. ,,	15,036	19,962	11,519	13,215
Ochres and earth colours cwt.	27,103	20,225	10,481	8,659
Bronze powders ,,	3,409	1,783	12,742	11,949
Carbon blacks .. ,,	24,521	58,247	25,417	87,921
Other pigments and extenders .. cwt.	32,198	31,950	8,392	8,862
All other descriptions ,,	9,404	20,180	22,939	38,138
Total .. .. value	—	—	778,362	909,306
Exports				
Acids—				
Citric .. .. cwt.	2,370	3,668	8,463	12,423
All other sorts .. value	—	—	23,026	19,140
Aluminium compounds tons	5,335	3,010	50,086	23,327
Ammonium sulphate ,,	21,068	19,854	123,404	113,910
Other Ammonium Salts .. ,,	413	752	8,942	11,993
Bleaching powder (chloride of lime) .. cwt.	54,491	47,423	14,599	13,622
Tar oil, creosote oil, etc. gal.	1,709,551	1,605,007	27,740	30,916
Other coal tar products value	—	—	38,564	28,391
Copper, sulphate of tons	1,652	2,398	24,363	33,183
Disinfectants, insecticides cwt.	24,464	28,982	53,590	67,518
Glycerine .. .. ,,	36,513	13,545	65,868	28,103
Lead compounds .. ,,	13,160	12,518	16,324	15,107
Magnesium compounds tons	456	418	10,382	9,891
Potassium compounds cwt.	7,794	7,985	12,500	14,855
Sodium compounds—				
Salt (sodium chloride) tons	24,674	28,136	70,655	73,346
Carbonate, including crystals, ash and bicarbonate .. cwt.	212,647	357,013	61,165	89,265
Caustic soda .. ,,	109,240	150,149	75,499	88,263
All other sorts .. ,,	94,330	165,229	62,313	89,001
Zinc oxide .. tons	1,156	1,178	22,548	22,425
All other descriptions value	—	—	163,929	204,660
Drugs, medicines and medicinal preparations—				
Quinine and quinine salts oz.	96,692	106,607	10,245	10,926
Proprietary medicines value	—	—	78,689	73,533
All other descriptions ,,	—	—	102,944	129,399
Dyes and dyestuffs and extracts for dyeing and tanning —				
Alizarine and indigo (synthetic) .. cwt.	2,423	797	15,264	4,391
Other finished dyestuffs (coal tar) .. cwt.	5,573	5,274	60,176	71,260
All other descriptions ,,	22,630	16,782	24,999	23,441
Painters' colours and materials—				
Ochres and earth colours cwt.	18,164	19,477	16,091	17,794
Other pigments and extenders .. cwt.	10,656	19,629	14,668	25,345
White lead .. ,,	3,721	5,901	7,095	11,038
Paints and painters' enamels, prepared cwt.	28,516	36,756	85,969	100,759
Varnish and lacquer gal.	76,774	67,961	30,999	30,003
All other descriptions cwt.	34,350	30,894	66,149	65,087
Total .. .. value	—	—	1,447,158	1,552,315
Re-Exports				
Chemical manufactures and products .. value	—	—	11,458	15,379
Drugs, medicines and medicinal preparations—				
Manufactured or prepared .. .. value	—	—	22,516	11,150
Raw or simply prepared value	—	—	7,529	7,766
Dyes and dyestuffs and extracts for dyeing and tanning .. .. cwt.	1,328	785	1,624	1,356
Painters' colours and materials .. .. cwt.	572	670	1,290	1,392
Total .. .. value	—	—	44,417	36,953

PYRITES production in Italy totalled 736,500 metric tons in 1933, as compared with 516,961 tons in 1932. Of the total, Montecatini supplied 646,072 tons and 422,733 tons respectively. The increased share of production by Montecatini was due to the opening of the new Niccioleta mine. Montecatini's yield of pyritic residues reached 300,556 tons in 1933: deliveries reached 213,249 tons.

Continental Chemical Notes

SODIUM NITRATE is now an approved food preservative in Poland, following an official decree dated July 12.

* * *

THE POTASSIUM SULPHATE OUTPUT of the Alsatian concern, Potasse et Engrais Chimiques, was more than doubled during 1933 as compared with the previous year.

* * *

THE FLOWER HARVEST AT GRASSE, the centre of the French essential oil industry, has proved disappointing this year, only 640,000 kg. orange blossom being collected as against last year's figure of 1,800,000 kg. The rose production was also small.

* * *

AFTER AN IDLE PERIOD OF FOUR YEARS, resumption of fertiliser manufacture has been decided upon by the Hungaria Artificial Fertiliser Factory following upon a subsidy from the Solvay concern. Four thousand tons of Algerian phosphate have been purchased in connection with the re-starting of the superphosphate plant.

* * *

BY FILLING ELECTRIC LAMP BULBS with krypton and xenon in place of argon, Georges Claude asserts that a 35 per cent. greater light radiation is obtained than before at the same cost. Researches undertaken by Claude in collaboration with Gonomet and André Claude go to show that these gases can be cheaply produced with ease on the technical scale. The Société d'Air Liquide contemplates their manufacture in the near future.

* * *

APPLICATIONS OF PURE DIOXAN (diethylene dioxide) to rapid estimation of moisture content of industrial products on the basis of the change in its dielectric constant with increasing moisture content are reviewed by Büil and Karsten in "Metallbörse" (August 15). Pure dioxan is a liquid with a boiling point of about 100° C. and miscible in all proportions both with water and benzine. The water-absorbing power of dioxan exceeds that of sand, salts, cement, air-moist active carbon, etc., to a sufficient extent to ensure very exact determinations. To estimate the water content of products like chalk, china clay and active carbon, a weighed quantity is mixed with an exact quantity of perfectly dry and pure dioxan. Alternatively the analysis can be carried out with the aid of the so-called Eluxan, a proprietary reagent in which dioxan is the essential ingredient. After absorption of water from the material under test (which takes place with great rapidity when the sample is finely powdered), the dielectric constant of the dioxan is measured with a special instrument, the dielkometer. The estimation can be completed in 15 minutes, thus representing a great saving in time over the usual method of drying to constant weight in an oven.

DISCOVERY OF A BITUMEN DEPOSIT is reported from the Sanok district of Eastern Galicia. Hopes are entertained of dispensing with importations of American asphalt.

* * *

EXTENSIVE DEPOSITS OF URANIUM ORE are reported to have been discovered in Russian Central Asia on the bank of the Majli-Su River, about 40 miles from the nearest railroad.

* * *

BY A BIOLOGICAL AND CATALYTIC PROCESS the Kaiser Wilhelm Institute for Coal Research claims to be able to transform water gas into an illuminating gas with an appreciably higher heating value. Part of the carbon monoxide is first catalytically converted into carbon dioxide and hydrogen by reaction with water vapour and the resulting gaseous mixture then reacted in the presence of bacteria which lead mainly to the formation of methane ("Chemiker-Zeitung," August 15).

* * *

CORROSION PROCESSES in iron immersed in sulphuric and hydrochloric acids are greatly accelerated by dissolved sulphur dioxide and sulphuretted hydrogen, according to recent work of Karnitzkij and Golubew ("Korrosion und Metallschutz," August, 1934). These two gases appear to exercise equal accelerating actions in hydrochloric acid, whereas sulphur dioxide is the more active in sulphuric acid. The accelerated corrosion is influenced by the hydrogen ion concentration, maximum acceleration taking place in 30 per cent. sulphuric acid.

* * *

VANILLIN is now one of the most important synthetic odoriferous substances produced on a large scale in North America, Germany and other European countries. The German consumption in the year 1930 to 1931 amounted to 116,000 kg., principally in the chocolate and confectionery industries, but is also used for manufacture of perfume oils, synthetic essential oils, etc. It is now produced from guaiacol or natural products like safrol (in turn derived from camphor oil), sassafras oil and eugenol (from clove oil). According to the "Chemiker-Zeitung," August 11, many methods have been patented for converting safrol into vanillin but all have been abandoned owing to their high cost. In synthesising vanillin from guaiacol the drawback arises of admixture with ortho-vanillin, iso-vanillin and dialdehyde, and the production of a product with the true vanillin odour is only possible at the cost of elaborate purification processes. The higher homologue of vanillin, ethyl-ether of protocatechuic aldehyde, is characterised by a much more intense vanillin aroma and is marketed under such names as bourbonal, novo-vanillin and vanirom. It is synthesised from guäthol (pyrocatechol monoethyl ester).

News from the Allied Industries

Whale Oil

A TRANSACTION IN WHALE OIL involving £1,500,000 sterling was concluded at Oslo on August 15 between a group of Norwegian whaling companies and the German Government. The whaling companies have agreed with the German Ministry of Food and Agriculture to deliver 150,000 tons of whale oil at £10 per ton.

Calico Printing

THE CALICO PRINTERS' ASSOCIATION announce a net profit of £164,872 for the year ended June 30. This compares with £123,926 for the preceding 12 months. After payment of the 5 per cent. preference dividend for the year the directors have £47,663 to carry forward, against £33,596 a year ago, when £50,000 was transferred from general reserve to reinforce the profit and loss account. No similar appropriation has to be made this time. For the fifth consecutive year ordinary shareholders are dividendless.

Iron and Steel

THERE WERE NINETY-NINE FURNACES in blast at the end of July compared with 100 at the beginning of the month. Production of pig-iron in July amounted to 527,200 tons, compared with 514,900 tons in June and 343,900 tons in July, 1933. The production includes 133,200 tons of hematite, 259,100 of basic, 112,200 tons of foundry, and 8,700 tons of forge pig-iron. The output of steel ingots and castings amounted to 718,200 tons, compared with 757,500 tons in June and 567,500 tons in July, 1933, the decline in production being due to holidays in Scotland.

IT IS RUMOURED IN THE UNITED STATES that a merger of the Truscon Steel Co. and the Republic Iron and Steel Co. is being negotiated. Mr. Julius Kahn, president of the former company, has refused to deny or confirm the reports. The Truscon Steel Co., which is a $14,000,000 concern, produces light finished steel products and has plants at Cleveland, Youngstown and Detroit. The company also owns large interests in the Truscon Steel Co., of Canada, and in the Japan Steel Products Co., Japan.

Weekly Prices of British Chemical Products

Review of Current Market Conditions

THERE is very little change to report on the condition of the chemical market during the week. In most sections the quoted prices are well maintained. The demand for industrial chemicals continues to be fairly active; acetic, oxalic and formic acids, and formaldehyde are still the best items. Ammonium chloride, salammoniac and salt cake are in moderate demand. In regard to arsenic, lithopone, resorcinol, sodium chlorate and zinc oxide the market is dull. Pharmaceutical products have been rather quiet, but business in citric and tartaric acids, cream of tartar and hydroquinone has been on a good scale. There has been a further improvement in the demand for coal tar pitch and the cresylic acid market continues to remain steady. Inquiry for creosote oil, both for home consumption and export, has been satisfactory. Business in essential oils has been on a moderate scale during the week.

LONDON.—Prices still remain unchanged, with quite a fair demand. The coal tar products market is firm and prices remain the same as last week.

MANCHESTER.—Although still not, perhaps, back to normal trading conditions, business on the Manchester chemical market is becoming less markedly under the influence of the holidays. During the past week buying has been a shade brisker again and although the majority of transactions have been in relatively small sized parcels for early delivery there has been a sprinkling of forward orders extending over the remaining months of the year. The quantities of the leading heavy products moving into consumption, including the alkalies and some of the soda compounds, tend to expand somewhat now that holiday interruptions are less in evidence than they have been during the last three or four weeks, and the prospects are for a fair flow of autumn trading. Few price changes of any consequence have occurred during the past week. With regard to the by-products market, most of the light materials are selling rather slowly though there has been little alteration in values. Export interest in the pitch section is only moderate.

SCOTLAND.—There is a steady improvement in the Scottish heavy chemical market, but prices show little or no change.

Price Changes.

Manchester.—POTASSIUM PERMANGANATE, B.P., 9½d. per lb.; POTASH, CAUSTIC, £37 10s. per ton.

All other prices remain unchanged.

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, £52.

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.—9d. per lb. less 5%.

ACID, CRESYLIC.—97/99%, 1s. 8d. to 1s. 9d. per gal.; 98/100%, 2s. to 2s. 2d.

ACID, FORMIC.—LONDON : £43 10s. 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, according to district and quality. SCOTLAND : 80°, £23 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 £53 ex store.

ACID, SULPHURIC.—SCOTLAND : 144° quality, £3 12s. 6d.; 168°, £7; dearsenicated, 20s. per ton extra.

ACID, TARTARIC.—LONDON : 1s. per lb. SCOTLAND : B.P. crystals, 11d., carriage paid. MANCHESTER : 1s. 0½d.

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.—£37 to £45 per ton, carriage paid. 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, £26 per ton, c.i.f. U.K. ports.

ANTIMONY SULPHIDE.—Golden 6½d. to 1s. 1½d. per lb.; crimson, 1s. 3d. to 1s. 5d. per lb., according to quality.

ARSENIC.—LONDON : £16 10s. 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, £20 10s. to £21 ex store.

ARSENIC SULPHIDE.—Yellow, 1s. 5d. to 1s. 7d. per lb.

BARIUM CHLORIDE.—£11 per ton.

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.—2s. 7d. to 2s. 11d.

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.—3⅞d. to 5d. per lb. LONDON : 4½d. to 5d.

CARBON TETRACHLORIDE.—£41 to £46 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.—LONDON : £4 2s. 6d. per cwt.

DINITROTOLUENE.—66/68° C., 9d. per lb.

DIPHENYLGUANIDINE.—2s. 2d. per lb.

FORMALDEHYDE.—LONDON : £26 per ton. SCOTLAND : 40%, £28 ex store.

IODINE.—Resumblimed B.P., 6s. 3d. per lb. for quantities not less than 28 lb., increasing to 8s. 4d. per lb. for quantities less than 4 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; brown, £31 10s.

LEAD, NITRATE.—£28 per ton.

LEAD, RED.—SCOTLAND : £25 10s. to £28 per ton; d/d buyer's works.

LEAD, WHITE.—SCOTLAND : £39 per ton, carriage paid. LONDON : £37 10s.

LITHOPONE.—30%, £17 10s. to £18 per ton.

MAGNESITE.—SCOTLAND : Ground calcined, £9 per ton, ex store.

METHYLATED SPIRIT.—61 O.P. Industrial, 1s. 6d. to 2s. 1d. per gal. Pyridinised industrial, 1s. 8d. to 2s. 3d. Mineralised, 2s. 7d. to 3s. 1d. 64 O.P. 1d. extra in all cases. Prices 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.—8¼d. to 9d. per lb. without engagement.

POTASH, CAUSTIC.—LONDON : £42 per ton. MANCHESTER : £37 10s.

POTASSIUM BICHROMATE.—Crystals and Granular, 5d. per lb. net d/d U.K. Discount according to quantity. Ground 5¼d. LONDON : 5d. per lb. with usual 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 : 99¼/100%, powder, £37. MANCHESTER : £38.

POTASSIUM CHROMATE.—6½d. per lb. d/d U.K.
POTASSIUM IODIDE.—B.P., 5s. 2d. per lb. for quantities not less than 28 lb.
POTASSIUM NIRATE.—SCOTLAND: Refined granulated, £29 per ton c.i.f. U.K. ports. Spot, £30 per ton ex store.
POTASSIUM PERMANGANATE.—LONDON: 9½d. per lb. SCOTLAND: B.P. crystals, 9d. MANCHESTER: Commercial, 8¾d.; B.P., 9½d.
POTASSIUM PRUSSIATE.—LONDON: 8½d. to 8¾d. per lb. SCOTLAND: Yellow spot material, 8½d. ex store. MANCHESTER: Yellow, 9½d.
RUPRON (MINERAL RUBBER).—£15 10s. per ton.
SAL AMMONIAC.—First lump spot, £41 17s. 6d. per ton d/d in barrels.
SODA ASH.—58% spot, £5 15s. 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 10s. 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: £23.
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 lb. net for spot lots and 4d. per lb. with discounts for contract quantities. SCOTLAND: 4d. delivered buyer's premises with concession for contracts.
SODIUM BISULPHITE POWDER.—60/62%, £18 10s. per ton d/d *1-cwt. iron drums for home trade.*
SODIUM CARBONATE (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 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, £15 ex station, 4-ton lots. MANCHESTER: Commercial, £9 5s.; photographic, £15.
SODIUM META SILICATE.—*£16 per ton, d/d U.K. in cwt. bags.*
SODIUM IODIDE.—B.P., 6s. per lb. for quantities not less than 28 lb.
SODIUM NITRITE.—LONDON: Spot, £18 to £20 per ton d/d station in drums.
SODIUM PERBORATE.—LONDON: 10d. per lb.
SODIUM PHOSPHATE.—£13 per ton.
SODIUM PRUSSIATE.—LONDON: 5d. to 5¼d. per lb. SCOTLAND: 5d. to 5¾d. ex store. MANCHESTER: 4¾d. to 5¾d.
SULPHUR.—£9 15s. to £10 per ton.
SODIUM SILICATE.—140° Tw. Spot £8 per ton d/d station, returnable drums.
SODIUM SULPHATE (GLAUBER SALTS).—£4 2s. 6d. per ton d/d SCOTLAND: English material £3 15s.
SODIUM SULPHATE (SALT CAKE).—Unground spot, £3 15s. per ton d/d station in bulk. SCOTLAND: Ground quality, £3 5s. per *ton d/d.* MANCHESTER: *£3 5s.*
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 2s. 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, £9 10s. d/d station in bags.
SULPHATE OF COPPER.—MANCHESTER: £14 5s. 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, 3s. 11d. to 4s. 1d. per lb.
ZINC CHLORIDE.—SCOTLAND: British material, 98%, £18 10s. per ton f.o.b. U.K. ports.
ZINC SULPHATE.—LONDON AND SCOTLAND: £12 per ton.
ZINC SULPHIDE.—11d. to 1s. per lb.

Coal Tar Products

ACID, CARBOLIC.—Crystals, 8¼d. to 8¾d. per lb.; crude, 60's, to 2s. 2¼d. *per gal.* MANCHESTER: Crystals, 7½d. per lb.; crude, 1s. 11d. per gal. SCOTLAND: 60's, 2s. 6d. to 2s. 7d.
ACID, CRESYLIC.—90/100%, 1s. 8d. to 2s. 3d. per gal.; pale 98%, 1s. 6d. to 1s. 7d.; according to specification. LONDON: 98/100%, 1s. 6d.; dark, 95/97%, 1s. 3d. 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, 9d. to 9½d. per gal.; standard motor, 1s. 3½d. to 1s. 4d.; 90%, 1s. 4d. to 1s. 4½d.; pure, 1s. 7½d. to 1s. 8d. LONDON: Motor, 1s. 6½d. SCOTLAND: Motor, 1s. 6½d.
CREOSOTE.—B.S.I. Specification standard, 4d. to 4½d. per gal. f.o.r. Home, 3¾d. d/d. LONDON: 3¾d. f.o.r. North; 4d. London. MANCHESTER: 3¼d. to 4¼d. SCOTLAND: Specification oils, 4d.; washed oil, 4¼d. to 4¾d.; light, 4¼d.; heavy, 4¼d. to 4¾d.
NAPHTHA.—Solvent, 90/160%, 1s. 6d. to 1s. 7d. per gal.; 95/160%, *1s. 7d. to 1s.* 8d.; 99%, *11d. to 1s.* 1d. LONDON: Solvent, 1s. 3½d. to 1s. 4d.; heavy, 11d. to 1s. 0½d. f.o.r. SCOTLAND: 90/160%, 1s. 3d. to 1s. 3½d.; 90/190%, 11d. 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, 57s. 6d. per ton, in bulk, at makers' works. LONDON: £3 per ton f.o.b. East Coast port for next season's delivery.
PYRIDINE.—90/140, 7s. 6d. to 9s. per gal.; 90/180, 2s. 3d *per gal.*
TOLUOL.—90%, 2s. to 2s. 1 per gal.; pure, 2s. 3d. to 2s. 4d.
XYLOL.—Commercial, 2s. 1d. per gal.; pure, 2s. 3d.

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 WINTHER.—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.
DINITROTOLUENE.—48/50° C., 9d. per lb.; 66/68° C., 01½d.
DINITROCHLORBENZENE, 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, 11½d. 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.

Nitrogen Fertilisers

THE following prices are current for nitrogenous fertilisers:—
SULPHATE OF AMMONIA.—*August, 1934,* £6 14s. 6d., *September* £6 16s., October £6 17s. 6d., November £6 19s., December £7, January, 1935, £7 2s., February £7 3s. 6d., March/June £7 5s. for neutral quality basis 20.6 per cent. nitrogen delivered in 6-ton lots to farmer's nearest station.
CYANAMIDE.—August, 1934, £6 15s., September £6 16s. 3d., October £6 17s. 6d., November £6 18s. 9d., December £7, January, 1935, £7 1s. 3d., February £8 2s. 6d., March £7 3s. 9d., April/June £7 5s., delivered in 4-ton lots to farmer's station.
NITRATE OF SODA.—£7 12s. 6d. per ton for delivery up to June, 1935, in 6-ton lots carriage paid to farmer's nearest station for material basis 15.5 per cent. or 16 per cent. *nitrogen.*
NITRO-CHALK.—£7 5s. per ton for delivery upto June, 1935, in 6-ton lots carriage paid to farmer's nearest station for material basis 15.5 per cent. nitrogen.

Latest Oil Prices

LONDON, August 22.—LINSEED OIL was *firmer.* Spot, £22 5s. (small quantities, 30s. extra); Sept.-Dec. and Jan.-April, £21 2s. 6d., naked. SOYA BEAN OIL was steady. Oriental (bulk), Aug.-Sept. shipment, £15 10s., sellers. RAPE OIL was quiet. Crude extracted, £27; technical refined, £28 10s., naked, ex wharf. COTTON OIL was firm. Egyptian crude, £14 10s.; refined common edible, £17 5s., and deodorised, £18 15s. naked, ex mill (small lots extra). TURPENTINE was unchanged. American, spot, 41s. 3d. per cwt.
HULL.—LINSEED OIL, spot, quoted £21 10s. per ton; Aug., Sept.-Dec., and Jan.-April, £21 2s. 6d., naked. COTTON OIL, Egyptian, crude, spot, £14 10s.; edible, refined, spot, £16 10s.; technical, spot, £16 10s.; deodorised, £18 10s. naked. PALM KERNEL OIL, crude, f.m.q., spot, £14 10s., naked. GROUNDNUT OIL, extracted, spot, £20; deodorised, £24. RAPE OIL, extracted, spot, £26; refined, £27 10s. SOYA OIL, extracted, *spot, £17; deodorised, £20 per ton.* COD OIL (industrial), 25s. per cwt. CASTOR OIL, pharmaceutical, 36s.; first, 31st.; second, 28s. per cwt. TURPENTINE, American, spot, 43s. 3d. per cwt.

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.

Films and Foils

A white or colourless transparent or translucent paper or other wrapping material is rendered impervious to ultra-violet light without changing its appearance by treatment with one or more of the following substances: umbelliferous acetic acid, its ester, umbelliferon and its derivatives, esculin, quinine, salol and anthracenes. The treatment may be carried out during manufacture or after, for example, by spraying or dipping. (See Specification No. 410,170 of C. Joseph.)

Active Carbon

Active carbon is prepared by carbonising raw material, such as peat, and bringing it while still hot into contact with a solution of a dehydrating agent such as zinc chloride. Carbonisation is effected at 200 to 300° C. in an externally heated container, zinc chloride solution being then added and the temperature raised to and maintained at 350° C. Extraction with water and hydrochloric acid, is then effected after which the carbon is washed with water, dried and ground. (See Specification No. 26955 of V. Weerts.)

Preventing Adhesion

A coating-material for preventing adhesion of sticky surfaces comprises a water-soluble metal alginate and a material for reducing the surface tension of its water solution. Single alginates, or double salts such as zinc ammonium alginate may be used, suitable surface tension reducing agents being soap, saponin or certain alkali metal alcoholates. Glycerin and glue may be added to the coating-material. The soluble alginate coating may, after application, be rendered insoluble by treatment with acids or with solutions of salts which would react to produce insoluble alginates. (See Specification No. 132522 of J. H. Young and H. H. Robertson Co.)

Recovery of Solvents by Adsorption

In the recovery by adsorption of solvents that are contaminated with corrosive substances such as sulphur chloride, the solvent laden air or gas is treated to remove said impurities and their decomposition products before it is passed through the adsorption apparatus. For example, the air either with or without a preliminary treatment with steam, may be scrubbed either with water or a weak alkaline solution to decompose the sulphur chloride and dissolve the resulting acids. The invention finds particular application in the cold curing of rubber. (See Specification No. 35029 of E. R. Sutcliffe and W. E. Edwards.)

Esters of Diethylmalonic Acid

Aliphatic esters of diethylmalonic acid are made by esterifying the acid and alcohol in presence of a neutral solvent such as benzine, benzene hydrocarbons, chlorinated hydrocarbons and ethers, and of an esterification catalyst such as sulphuric, hydrochloric, phosphoric or a sulphonic acid or an acid sulphuric acid ester. Examples describe effecting the esterification with: (1) diethylmalonic acid, ethyl alcohol, and sulphuric acid in presence of benzene; (2) diethylmalonic acid, butyl alcohol and sulphuric acid in presence of benzine of boiling-point 70-80° C.; (3) the second example is varied by boiling together the butyl alcohol, sulphuric acid and benzine so as to produce butyl sulphuric acid, and then adding the diethylmalonic acid. (See Specification No. 410,385 of Dr. A. Wacker Ges. für Electro-Chemische Industrie Ges.)

Coating-Compositions for Leather

A waterproof finish for leather is made by incorporating an aqueous emulsion of a long chain aliphatic alcohol, containing 10 or more carbon atoms, with an alkaline shellac solution, to form a composite emulsion. Cetyl alcohol, and the alcohol from lauric acid, are specified, and emulsifying agents such as triethanolamine, casein, glue and gum may be added, together with dyes and other pigments. As examples:—(1) An emulsion is made from cetyl alcohol, stearic acid, triethanolamine and water, and an ammoniacal solution of shellac is added. (2) An emulsion is made from cetyl alcohol, stearic acid and an ammoniacal casein solution, and to this are added turkey red oil, a diazo dye, titanium white and an ammoniacal solution of shellac. (See Specification No. 32134 of Imperial Chemical Industries, Ltd., S. H. Oakeshott, A. Stewart and W. Todd.)

Making Dispersions

Amides of dithiocarbonic acid, prepared from carbon bisulphide and an aliphatic secondary amine containing an alkyl chain of at least three carbon atoms are stated to be dispersing agents for solvents and other substances which are insoluble in strong alkali lyes. In examples, amides of dithiocarbonic acid derived from the following secondary amines are employed: di-*n*-propyl and n-butyl amines, ethyl-*n*-butylamine, di-*n*-butylethylenediamine, *n*-butyl-monoethanolamine. (See Specification No. 31683 of A. Carpmael.)

Lecithin

A stable preparation of lecithin is prepared by treating a lecithin sludge from soya beans (consisting of lecithin, water, and oil) with glycerin or a strong solution of a sugar in water or glycerin to remove a part of the water. By centrifugal separation more of the water and some of the oil may be removed. The glycerin or sugar solution is again concentrated for re-use. Instead of sugar molasses or "capillar syrup" (a hydrolysed starch) may be employed. (See Specification No. 410,357 of Nobles and Thorl Ges.)

Potassium Nitrate

In the production of potassium nitrate from potassium sulphate and nitric acid, the reaction components are used in such relative quantities that, after separation of potassium nitrate, the mother liquor is almost saturated with the double salt $KHSO_4$. KNO_3, as well as with potassium nitrate. Examples are given using varying strengths of nitric acid with separation temperatures for potassium nitrate of 25° C. and 0° C. Double salts or mixtures of potassium sulphate with sodium or magnesium sulphate may be used for the reaction. The mother liquors may be employed in the decomposition of phosphates. (See Specification No. 29480 of Kali-Forschungs-Anstalt Ges.)

Coating Compositions

A coating composition to prevent adhesion of sticky surfaces comprises a water-soluble metal alginate and a material for reducing the surface tension of its water solution. Single alginates, or double salts such as zinc ammonium alginate may be used, suitable surface tension reducing agents being soap, saponin or certain alkali metal alcoholates. Glycerin and glue may be added to the coating material. The soluble alginate coating may, after application, be rendered insoluble by treatment with acids or with solutions of salts which would react to produce insoluble alginates. (See Specification No. 410,305 of J. H. Young and H. H. Robertson Co.)

Rust-Proofing Composition

A rust-preventing or rust-removing composition consists of a water-insoluble binding material which dries in the air, a rust or metal-dissolving acid and an organic acid or salt or derivative thereof. The metal salt formed by the action of the metal-dissolving acid forms with the organic acid an insoluble precipitate which adheres to the metal. In examples, phosphoric or a volatile acid such as formic acid is mixed with tannic, gallic, pyrogallic, benzoic or nucleic acid and the mixture incorporated in cellulose or other varnish. Small amounts of stannous or stannic chloride may be added as catalysts together with inert pigments such as titanium white, heavy spar, graphite or soot. (See Specification No. 15773 of R. Burstenbinder.)

Detergents

Detergents ensuring bacteriological cleanliness consist of an alkali metal carbonate or phosphate mixed with a proportion of stable calcium hypochlorite insufficient to react completely with the carbonate or phosphate; on addition of water alkali hypochlorite is produced and part of the carbonate or phosphate remains. Stable hypochlorite is defined as one containing less than 5 per cent. of chloride. In an example, 3—8 lb. of a hypochlorite composed of 60—65 per cent. of calcium hypochlorite, 35—30 per cent. of sodium chloride, and 5 per cent. of calcium chlorate, carbonate, and chloride, is mixed with 95 lb. of trisodium phosphate monohydrate. If necessary the carbonate or phosphate is dried before mixing in the hypochlorite; and if desired the calcium sulphate or phosphate precipitated on addition of water may be removed by decantation or filtration. (See Specification No. 33450 of L. Mellersh-Jackson.)

Wetting Agents

Amides of dithiocarbonic acid, prepared from carbon bisulphide and an aliphatic secondary amine containing an alkyl chain of at least three carbon atoms are used as wetting agents in mercerising vegetable fibres with alkaline lyes. Dispersing agents, such as phenols, sulphurised phenols and sulphonated oils may be added as well as solvents and other insoluble substances. In examples, the amides of dithiocarbonic acid are prepared from the following secondary amines, usually in the presence of caustic alkali, and are added to customary alkaline mercerising lyes: di-*n*-propylamine, ethyl-*n*-butylamine, di-*n*-butylethylene-diamine, di-*n*-butylamine, *n*-butylmonoethanol-amine. (See Specification No. 410,104 of A. Carpmael.)

Tri-alkali Phosphates

In producing trialkali phosphates, a mixture of ferrophosphorus and alkali or alkali carbonate is heated at gradually increasing temperature, but always below the fusion point of the mass at any particular stage, the initial and final reaction temperatures being 550—700° C. and 1100—1250° C. respectively. The melting point of the mass at an intermediate stage may be below that of the initial mixture and when a batch-type process is effected, the irregular temperature gradient may be followed. When a uniform temperature gradient is necessary, as is the case when the process is effected in a rotary kiln, it is necessary to employ an initial temperature considerably below the melting point of the starting materials. The reaction mixture is heated in the rotary kiln preferably by a countercurrent blast of heated gases from the combustion of petroleum hydrocarbons. (See Specification No. 27,191 of W. J. Tennant.)

Oxalic Acid

Potassium oxalate is obtained in good yield from potassium formate by heating the latter to temperatures between 260° and 530° C. preferably 300°—400° C., in presence of alkali hydroxide in greater quantities the lower the temperature, and maintaining the hydrogen partial pressure below its equilibrium pressure and preferably at 0—1 atmospheres absolute. The said pressure may be continuously lowered by introducing inert gases such as nitrogen or other gases not containing oxygen, carbon monoxide, nitrous oxide or other oxidizing gases, through the presence of small quantities of such oxidising gases may be neutralised by increasing the alkali content of the formate. The formate is preferably introduced in a molten condition into the reaction vessel and diluents such as preformed potassium oxalate may be employed. Examples are given in which a current of nitrogen, containing varying quantities of oxidising impurities is introduced into the melt. (See Specification Nos. 17,016, 17,017 of Koepp and Co., Chemische Fabrik A.-G.)

Utilisation of Sawdust

Wood-chips, sawdust or straw are thoroughly mixed with sulphuric acid at slightly elevated temperature. The product is filtered and washed without or with dilution, and the filtrate, preferably of 40—60 per cent. sulphuric acid concentration, if necessary obtained by boiling under reduced pressure, is oxidised with nitric acid or nitrogen oxides at slightly elevated temperature, 50—75° C. in presence of an oxidation catalyst such as vanadic acid. The nitric acid may be partly regenerated by passing oxygen or an oxygen-containing gas through the liquid, with various designs of apparatus for promoting the regeneration, the gas space being larger than the liquid space. The oxalic acid obtained is very pure. According to examples, fine wood sawdust and fine wood shavings are treated as above. The process may be combined with the manufacture of nitric acid from oxides of nitrogen, or by catalytic oxidation of ammonia, the nitrogen oxides obtained being added to those used or produced in such processes. (See Specification No. 14,842 of Consortium Für Elektrochemische Industrie.)

Complete Specifications Open to Public Inspection

REMOVAL AND RECOVERY of benzene and naphthalene from gases, particularly coal distillation gases.—A. Schmalenbach. Jan. 25, 1933. 2644/34.

PYROLYSIS OF OLEFINES.—E. I. du Pont de Nemours and Co. Jan. 27, 1933. 2739/34.

DEVELOPING SILVER HALIDE EMULSIONS.—I. G. Farbenindustrie. Jan. 26, 1933. 2751/34.

SENSITISING PHOTOGRAPHIC SILVED HALIDE EMULSIONS.—I. G. Farbenindustrie. Jan. 26, 1933. 2752/34.

UNSATURATED XANTHATES, manufacture.—Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij. Jan. 30, 1933. 2794/34.

SYNTHETIC LACQUER, preparation.—Soc. des Laques et Matières Plastiques. Jan. 28, 1933. 2939/34.

TREATING MATERIALS in the textile, leather, and paper industries.—Soc. of Chemical Industry in Basle. Jan. 30, 1933. 3135/34.

MANUFACTURING WETTING, CLEANING, BLEACHING and dispersive agents for use in the textile and other industries and the products obtained thereby.—Naamlooze Vennootschap Chemische Fabriek Servo and M. D. Rozenbroek. Jan. 30, 1933. 3036/34.

OLEFINE ALCOHOLS and their derivatives, production.—H. T. Böhme A.-G. Feb. 10, 1933. 28745/33.

KRYPTON AND XENON from atmospheric air, manufacturing.—Soc. l'Air Liquide, Soc. Anon. Pour l'Etude et l'Exploitation des Procédés G. Claude. Feb. 9, 1933. 3267/34.

WATER-SOLUBLE ANTHRAQUINONE DYESTUFFS, manufacture.—Chemical Works, formerly Sandoz. Feb. 8, 1933. 3771/34.

SENSITISING PHOTOGRAPHIC SILVER HALIDE emulsions and manufacture of sensitising dyes therefor.—I. G. Farbenindustrie. Feb. 7, 1933. 4031/34.

CLEANSING OF REFINING OILS and other materials, method.—A. Franke and G. Thomas. Feb. 7, 1933. 4074/34.

ADHESIVES.—I. G. Farbenindustrie. Feb. 8, 1933. 4091/34.

AZO DYESTUFFS, manufacture.—Deutsche Hydrierwerke A.-G. Feb. 7, 1933. 4102/34.

5-PYRAZOLONE-DERIVATIVES, manufacture.—I. G. Farbenindustrie. Feb. 8, 1933. 4208/34.

PURE ZINC OXIDE, obtaining.—E. Sterkers and L. C. Humbert. Feb. 10, 1933. 4323/34.

DYEING OR PRINTING VEGETABLE FIBRES.—Soc. of Chemical Industry in Basle. Feb. 9, 1933. 4377-8/34.

DYEING WITH DIRECT DYESTUFFS.—Soc. of Chemical Industry in Basle. Feb. 9, 1933. 4379/34.

OXAZINE DYESTUFFS, manufacture.—I. G. Farbenindustrie. Feb. 10, 1933. 4480/34.

CYCLIC 1-2-AMINO KETONES, method of manufacturing.—P. W. Neber. Feb. 15, 1933. 4799/34.

DISPERSIONS, preparation.—Dr. H. Hunsdiecker and Dr. E. Vogt. Dec. 14, 1932. 22966/34.

DISSOLVING DEPOSITS of alkaline-earth metal compounds, processes.—Hall Laboratories, Inc. Aug. 22, 1932. 23326/34.

NITROSYL CHLORIDE, decomposition.—Kali-Forschungs-Anstalt Ges. Feb. 2, 1933. 32641/33.

DEGREASING AND CLEANING articles of metal by means of a volatile solvent, apparatus.—Dr. A. Wacker Ges. für Elektro-Chemische Industrie Ges. Feb. 1, 1933. 1096/34.

PURE CHROMIUM COMPOUNDS, making.—Dr. W. Hene. Jan. 31, 1933. 1673/34.

OXIDATION OF ISOALDEHYDES.—Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij. Feb. 3, 1933. 1988/34.

ISOLATING FOLLICLE HORMONES, method.—Schering-Kahlbaum A.-G. Jan. 31, 1933. 2787/34.

CONCENTRATED SOLUTIONS of follicle hormones and their esters, production.—Schering-Kahlbaum A.-G. Jan. 31, 1933. 3164/34.

DYESTUFFS of the anthraquinone series, manufacture.—I. G. Farbenindustrie. Feb. 1, 1933. 3278/34.

CRACKING HYDROCARBONS by pressure heating in the liquid phase, processes.—C. Still. 3373/34.

ORTHO-AMINO-AZO-COMPOUNDS, manufacture.—I. G. Farbenindustrie. Feb. 1, 1933. 3374/34.

ORTHO-DISAZO-DYESTUFFS, manufacture.—I. G. Farbenindustrie. Feb. 2, 1933. 3488/34.

SODIUM and other light metals, manufacture.—E. I. du Pont de Nemours and Co. Feb. 2, 1933. 3559/34.

AQUEOUS SOLUTIONS of hydrogen peroxide, purification.—E. I. du Pont de Nemours and Co. Feb. 6, 1933. 3955/34.

Specifications Accepted with Dates of Application

FISH LIVER OILS, manufacture.—A. T. A. D. Middlemass. Jan. 10, 1933. 414,717.

ARTIFICIAL COMPOSITIONS, manufacture and production.—J. Y. Johnson (I. G. Farbenindustrie). Feb. 6, 1933. 414,699.

DYESTUFFS of the anthraquinone series, manufacture.—I. G. Farbenindustrie. Feb. 8, 1932. 414,664.

CONDENSATION PRODUCTS, process for the manufacture.—I. G. Farbenindustrie. Feb. 8, 1932. 414,665.

HALOGENATED ARYLAMINES, manufacture.—Imperial Chemical Industries, Ltd. (E. I. du Pont de Nemours and Co.). Feb. 5, 1933. 414,667.

AZO DYESTUFFS and intermediate products therefor, process for the manufacture.—I. G. Farbenindustrie. Feb. 8, 1932. 414,684.

THERAPEUTICALLY-ACTIVE PREPARATION, manufacture.—I. G. Farbenindustrie. Feb. 8, 1932. 414,685.

ALKYL HALIDES, manufacture.—E. H. Strange and T. Kane. Feb. 13, 1933. 414,766.

STABLE DIAZONIUM COMPOUNDS, process for the manufacture.—I. G. Farbenindustrie. Feb. 13, 1932. 414,768.

SYNTHETIC RESIN MOULDINGS, manufacture.—E. K. Cole, Ltd., and E. Hahn. Feb. 21, 1933. 414,789.

TANNING EXTRACTS soluble when cold, process for the manufacture.—W. W. Triggs (Chemische Fabrik Stockhausen et Cie). Feb. 28, 1933. 414,799.

INTAGLIO PRINTING INKS, manufacture and production.—J. Y. Johnson (I. G. Farbenindustrie). March 6, 1933. 414,801.

DYEING FURS, process.—Soc. of Chemical Industry in Basle. June 2, 1932. 414,872.

DYEING ACETYL-CELLULOSE and mixed materials containing acetyl-cellulose.—J. R. Geigy A.-G. Jan. 8, 1932. 414,770.

AQUEOUS DISPERSIONS of carbon black.—Dewey and Almy, Ltd. Nov. 28, 1932. 414,932.

8-HYDROXYQUINOLINE, production of a water-soluble derivative. J. D. Riedel-E. de Haen A.-G. Dec. 9, 1932. 414,941.

HALOGENATED PHENYLTHIOGLYCOLLIC ACIDS, manufacture.—Soc. of Chemical Industry in Basle. Dec. 23, 1932. 414,952.

SUBSTANCES SUITABLE AS WETTING, washing, dispersing, and like agents, manufacture and production.—J. Y. Johnson (I. G. Farbenindustrie. Nov. 5, 1932. (Divided application on 414,712.) 414,772.

PIGMENT PURIFICATION.—H. G. C. Fairweather (Calco Chemical Co., Inc.). Dec. 18, 1933. 414,285.

BARBITURIC ACID DERIVATIVES, manufacture.—Chemische Fabrik von Heyden Akt.-Ges. Jan. 6, 1933. 414,293.

AROMATIC AMINO BASES, manufacture.—Soc. of Chemical Industry in Basle. Feb. 3, 1932. 414,404.

AZO DYESTUFFS and intermediate products therefor, manufacture.—A. Carpmael (I. G. Farbenindustrie). Feb. 1, 1933. 414,381.

DERIVATIVES OF 1-NITROANTHRAQUINON-6-CARBOXYLIC ACID, manufacture.—E. I. du Pont de Nemours and Co. Feb. 3, 1932. 414,415.

PLASTIC MATERIALS, process for the manufacture.—I. G. Farbenindustrie. Feb. 9, 1932. 414,425.

SOLID VAT DYESTUFF PREPARATIONS.—I. G. Farbenindustrie. Feb. 10, 1932. 414,426.

LACQUERS CONTAINING ARTIFICIAL RESINS and of materials for making such lacquers, production.—A. Nowack A.-G., and Dr. R. Hessen. Feb. 13, 1933. 414,435.

AZO DYESTUFFS, production.—I. G. Farbenindustrie and Soc. of Chemical Industry in Basle. May 6, 1932. 414,446.

ASYMMETRICAL THIOUREA-DERIVATIVES, manufacture.—A. Carpmael (I. G. Farbenindustrie). March 10, 1933. 414,452.

AMINONAPHTHOL SULPHONIC ACIDS containing residues of bile acids and for the manufacture of dyestuffs therefrom, process for the manufacture.—Chemische Fabrik Vorm. Sandoz. April 9, 1932. 414,453.

CELLULOSE ESTERS, process for producing.—O. Sindl. March 24, 1932. 414,461.

MERCERISATION OF TEXTILE MATERIALS and like processes.—E. I. du Pont de Nemours and Co. May 24, 1932. 414,485.

ANTHRAQUINONE DYESTUFFS, manufacture.—Soc. of Chemical Industrie in Basle. Sept. 15, 1932. 414,529.

CATALYSTS, manufacture.—Intermetal Corporation. Oct. 1, 1932. 414,536.

AROMATIC DICARBOXYLIC ACID CHLORIDES, manufacture.—W. W. Groves (Monsanto Chemical Co.). Dec. 18, 1933. 414,570.

DICARBOXYLIC ACID CHLORIDES, manufacture.—W. W. Groves (Monsanto Chemical Co.). Dec. 19, 1933. 414,572.

ALKALI SALTS OF NAPHTHALENE-1-SULPHONIC ACID, manufacture.—J. R. Geigy A.-G. Dec. 22, 1932. 414,573.

CATALYTIC PROCESS for the manufacture of nuclear substituted aromatic amines.—I. G. Farbenindustrie. Dec. 22, 1932. 414,574.

Applications for Patents

(August 2-8 inclusive.)

SENSITISING PHOTOGRAPHIC EMULSIONS.—T. T. Baker and Dufaycolor, Ltd., 22794.

PLASTIC COMPOSITION.—S. Beckinsale. 22662.

BITUMEN DISPERSIONS, manufacture.—J. F. T. Blott. 22561.

HYDROGENATION PRODUCTS from follicle-hormone, etc., preparation.—C. F. Boehringer and Soehne Ges., and W. Dirscherl. (Oct. 6, '33.) 22588.

DYEINGS ON CELLULOSIC FIBRES.—A. Carpmael (I. G. Farbenindustrie). 22576.

CHROMO-COMPLEX COMPOUNDS of monoazo dyestuffs, manufacture.—A. Carpmael (I. G. Farbenindustrie). 22577.

AZO DYESTUFFS, manufacture.—A. Carpmael (I. G. Farbenindustrie). 22579.

DISAZO DYESTUFFS, manufacture.—A. Carpmael (I. G. Farbenindustrie). 22580.

CELLULOSIC TEXTILE FIBRES, treatment.—A. Carpmael (I. G. Farbenindustrie). 22985.

DICHLORACEITC ACID, preparation.—Compagnie de Produits Chimiques et Electrométallurgiques Alais, Froges, et Camargue. (France, Aug. 17, '33.) 22740.

AZO DYESTUFFS, manufacture.—Compagnie Nationale de Matières Colorantes et Manufactures de Produits Chimiques du Nord Réunies Etablissements Kuhlmann. (France, Aug. 10, '33.) 22723.

ALKALI METAL CYANIDES, manufacture.—E. I. du Pont de Nemours and Co. (United States, Aug. 8, 33.) 22975.

ANTHRAQUINONE DERIVATIVES, manufacture.—W. W. Groves (I. G. Farbenindustrie). 22666.

DISPERSIONS, preparation.—H. Hunsdiecker. (Dec. 14, '33.) (Germany, Dec. 14, '32.) 22966, 22967

MULTICOLOUR PHOTOGRAPHIC PICTURES, manufacture.—I. G. Farbenindustrie. (Germany, Aug. 4, '33.) 22562.

ORTHOCHROMATIC EMULSIONS, manufacture.—I. G. Farbenindustrie. (Germany, Aug. 3, '33.) 22665.

COLOURED PHOTOGRAPHIC PICTURES, production.—I. G. Farbenindustrie. (Germany, Aug. 8, '33.) 22950.

RUBBER, preservation.—Imperial Chemical Industries, Ltd. 22715.

FLOOR COVERINGS, manufacture.—Imperial Chemical Industries, Ltd. 22716.

RUBBER-COMPOUNDING INGREDIENTS.—Imperial Chemical Industries, Ltd. 22976.

NAPHTHALENE DERIVATIVES, manufacture.—Imperial Chemical Industries, Ltd., A. Kershaw and M. Wyler. 22977.

DESTRUCTIVE HYDROGENATION of solid distillable carbonaceous material.—International Hydrogenation Patents Co., Ltd. (Germany, Aug. 18, '33.) 22917.

REACTIVE ALUMINA, manufacture.—J. Y. Johnson (I. G. Farbenindustrie.) 22863.

ALKYL HALIDES, manufacture.—J. Y. Johnson (I. G. Farbenindustrie). 22864.

FERTILISERS, manufacture.—J. Y. Johnson (I. G. Farbenindustrie.) 22866.

ORGANIC VINYL SULPHOXIDES, manufacture.—J. Y. Johnson (I. G. Farbenindustrie). 22941.

ORGANIC SULPHUR COMPOUNDS, manufacture.—J. Y. Johnson (I. G. Farbenindustrie). 22942.

SYNTHETIC COMPOUNDS.—W. Johnson. 22510.

DYES, production.—J. D. Kendall. 22727.

PLASTIC COMPOSITION of bitumen and vulcanised rubber, producing.—R. Riecke. (Germany, Feb. 2.) 22689.

(August 9 to 15 inclusive).

ALKALI EARTH METAL NITRATES, production.—Atmospheric Nitrogen Corporation. (United States, Aug. 12, '33.) 23333.

SODIUM CARBONATE, manufacture.—E. F. Burns, H. E. Cocksedge, and Imperial Chemical Industry, Ltd. 23599.

HYDROCYANIC ACID, manufacture.—P. J. Carlisle, E. I. du Pont de Nemours and Co., and A. D. McCallum. 23381.

ANTHRAQUINONE DYESTUFFS, manufacture.—Chemical Works, formerly Sandoz. (Germany, Feb. 16.) 23209.

DYESTUFF INTERMEDIATES, manufacture.—E. I. du Pont de Nemours and Co. (United States, Aug. 11, '33.) 23321.

ALKYLATED 5 : 5-PHENYLETHYL-HYDANTOINS, manufacture.—L. S. E. Ellis (Chemical Works, formerly Sandoz). (Dec. 15, '33.) 23459, 23460.

CARBONACEOUS MATERIALS, distillation.—F. Esling and W. G. Morris. 23193.

HIGHLY-DISPERSED SILICIC ACID, production.—W. Fuchs. 23006.

PIGMENTS, production.—W. Fuchs. 23007.

ADSORBENTS, production.—W. Fuchs. 23008.

WATER-SOLUBLE OXIDES, production.—W. Fuchs. 23009.

RECOVERY of valuable products from sea water, etc.—C. J. Greenstreet. 23156.

LOW-TEMPERATURE DISTILLATION OF COAL.—A. L. M. Grezes. (France, Aug. 9, '33.) 23091.

LOW-TEMPERATURE DISTILLATION OF COAL.—A. L. M. Grezes. (France, July 24.) 23092.

ORGANIC ACID ANHYDRIDES, manufacture.—W. W. Groves (Akt.-Ges. für Stickstoffdünger). 23436.

ALKYLATED, ETC., POLYAMINO-ANTHRAQUINONES, manufacture.—W. W. Groves (I. G. Farbenindustrie). 23050.

VAT DYESTUFFS, manufacture.—I. G. Farbenindustrie. (Germany, Aug. 9, '33.) 23051.

DYESTUFFS, manufacture.—I. G. Farbenindustrie. (Germany, Aug. 11, '33.) 23185, 23340.

AZO DYESTUFFS, manufacture.—I. G. Farbenindustrie. (Germany, Aug. 12, '33.) 23341.

AZO DYESTUFFS, manufacture.—I. G. Farbenindustrie. (Germany, Aug. 15, '33.) 23475.

SUBSTITUTED AROMATIC AMINO-COMPOUNDS, manufacture.—I. G. Farbenindustrie. 23532.

INTERMEDIATES AND DYESTUFFS of the naphthalene series, manufacture.—Imperial Chemical Industries, Ltd., and M. Wyler. 23382.

AZO DYES, manufacture.—Imperial Chemical Industries, Ltd. (United States, Aug. 15, '33.) 23598.

SODIUM CARBONATE, manufacture.—Imperial Chemical Industries, Ltd. 23599.

RECOVERY OF PURE SULPHUR from crude sulphur.—J. Y. Johnson (I. G. Farbenindustrie). 23064.

CARBONACEOUS MATERIALS, distillation.—J. Lefevre. (Germany, Aug. 12, '33.) 23343.

AMMONIUM CHLORIDE, separating.—Soc. d'Etudes pour la Fabrication et l'Emploi des Engrais Chimiques. (France, Dec. 21, '33.) 23240.

SEPARATION OF AMMONIUM SALTS from mixtures.—Soc. d'Etudes pour la Fabrication et l'Emploi des Engrais Chimiques. (France, Jan. 13.) 23542.

SULPHURISED DYESTUFFS, manufacture.—Soc. of Chemical Industry in Basle. (Switzerland, Aug. 19, '33.) 23536.

From Week to Week

DR. T. P. HOGG, who was for many years in the service of T. Kerfoot, manufacturing chemists, Ashton-under-Lyne, died last week at the age of 45.

THE INSTITUTE OF CHEMISTRY (London and South-Eastern Counties Section) will hold their dance at the Hotel Russell, London, on Friday, October 26, 1934, instead of October 19, as previously stated.

NOR-RUST LIQUID LEAD CO., LTD., announce that all orders and correspondence should now be sent to 40 Feeder Road, Bristol 2. Telephone 76815. The registered office of the company is at 14 Clarges Street, London, W.

NEWCASTLE CORPORATION are inviting tenders to demolish property formerly occupied by Langdale's Chemical Works, the site which the Trade and Commerce Committee recommended should be let to Spillers, Ltd., the millers, for a new £400,000 factory.

IT IS STATED that the Blochain and Newton plants of the Steel Co. of Scotland will be continued as at present, as in the opinion of the directors the present management would be more economical than a merger.

MR. G. S. NEWALL, managing director of the Washington Chemical Co., Durham, entertained at his residence, Wylam Hall, 96 employees whose total service exceeds 2,000 years. The men were drawn from all departments of the works and offices and each one had more than 20 years' service with the firm.

CONSTRUCTION WORK at the Copper Cliff smelter of the International Nickel Co. of Canada is proceeding up to schedule, and the new plant is likely to be installed by the end of the year. The extension is necessary for the housing of a battery of four new converters.

THE ENSO-GUTZEIT CO. AND THE TORNATOR CO. will shortly construct a new sulphate factory, at the Saimen Lake, Finland. The factory will have a capacity of 80,000 tons of sulphate cellulose per year. The Enso-Gutzeit Co. has been experimenting with the refuse left from the production of sulphate cellulose. It has been ascertained that the refuse can be utilised for the production of cement, owing to the fact that it contains a certain amount of chalk.

THE FIFE PAPER MILLS, of Tullis, Russell and Co., Ltd., at Markinch, are now engaged in the manufacture of paper sacks of all descriptions on a large scale. Paper sacks have recently made great strides as a method of packing, and the progress already made by the company leads them to believe that they will find a ready market for their products in Scotland. Previously all paper sacks were manufactured in England. Products for which these sacks are used include cement, salt, cereals, pig food, coke and granulated materials.

RECENT RESEARCH by an important salt company has demonstrated that Monel metal has the desirable property of resisting adhesion of salt crystals. This property is useful in connection with crystallisers where the accumulation of crystals on the sides of the equipment is objectionable, since it reduces the efficiency of the apparatus. The experiments referred to were made with table salt (sodium chloride), but the chemist who made the test reported that this property of Monel metal extended equally to crystals of other chemicals.

INCREASED WORLD ACTIVITY IN CHEMICAL RESEARCH is disclosed by Professor E. J. Crane, of Ohio State University, editor of "Chemical Abstracts," in which the findings of the international science reporting system of the American Chemical Society are assembled. Digests of chemical papers appearing in 2,000 scientific and technical journals of the leading nations numbered 18,664 during the first six months of 1934, as against 17,648 in the like period of 1933, according to the report, which will be submitted to the Society at its 88th meeting, September 10 to 14. "This increase," said Professor Crane, "is heartening from an economic standpoint because of chemistry's basic association with practically all of the industries. It indicates that thousands of chemists throughout the world are turning out a steady stream of new information vital to industrial and social progress."

THE WOODALL-DUCKHAM CO. have received from the British (Guest Keen Baldwins) Iron and Steel Co., Ltd., a contract for the large by-product coking plant which the latter firm is installing in connection with the reorganisation of their Cardiff works. The contract includes a battery of Becker coke ovens, divided into two sections. The ovens will be arranged so that they can be heated either by blast furnace gas or by coke oven gas as required, and will have a total net production capacity of 5,850 tons of blast furnace coke a week. The contract also comprises the supply of all oven machinery, a reinforced concrete oven storage bunker for 2,400 tons of washed coal, a coke quenching station and wharf and complete by-product plant for recovery of crude tar, sulphate of ammonia and benzol. The benzol plant will provide for rectification of crude benzol to motor fuel.

SIR ERNEST AND LADY BENN are leaving London for a tour in Poland. They will travel by way of the Kiel Canal and visit Danzig, Warsaw, Craców, and the Carpathians.

THE COUNCIL OF THE MINING INSTITUTE OF SCOTLAND have decided that the general meeting usually held in the Royal Technical College, Glasgow, in August, shall be postponed until September 26.

SIR ROBERT MOND, F.R.S., director of the South Staffordshire Mond Gas Co., the International Nickel Co., Ltd., and the Mond Staffordshire Refinery Co., Ltd., is stated to be ill at his house, Castle Mond, Dinard. Sir Robert Mond was born at Farnworth, near Widnes, in 1867.

THE NEW GENERAL MANAGER AND CHEMIST for the Sheffield sewage department, recommended by the Highway and Sewage Committee for the City Council to confirm at its meeting in September, is Mr. J. H. Edmondson, at present sewage engineer, chemist, and manager for the Halifax Corporation. His salary will be £800, rising in two years to £1,000.

THE EASTERN SEA FISHERIES BOARD—having jurisdiction over the Lincolnshire and Norfolk Coast—has granted an application made by the Washaven Oil Wharves, Ltd., to erect oil storage tanks and wharves at Butterwick, in the Wash, on the Lincolnshire Coast, subject to proper safeguards being instituted, and the work being properly carried out. This is an important new venture on a big scale.

NEW REGULATIONS HAVE BEEN ISSUED in Germany for the industrial use of copper, nickel, tin and their alloys, and of mercury. It is forbidden until further notice to use copper or nickel for lightning rods, for electric wires of more than twenty-five square millimetres section, for roof or floor covers, radiators, shop signs and medals. Tin must not be used for the production of solder sticks, and the use of mercury is forbidden for the production of vermilion.

MELLON INSTITUTE announces that an Industrial Fellowship for research on paper milk bottle caps, bottle closures, and the study and improvement of paper packages for food and dairy products has been established by the Toledo Bottle Cap Co., of Toledo, Ohio. It is conservatively estimated that the annual retail distribution fluid milk products in the United States to-day requires the use of about 12,000,000,000 paper bottle caps of various styles. The manufacture of these caps consumes daily about 100,000 pounds of paper.

THE BODY OF JAMES MEANEY, aged 14 years, was found in a cement hopper at the Croft Granite, Brick and Cement Co.'s works at Widnes, on July 13. It appears that the boy had express instructions not to enter the hopper, and no evidence was forthcoming when the inquest was held, to show how he got there. Questioned by Mr. Hunt, H.M. Inspector of Factories, Frederick Connor, one of the employees, who discovered the body, said it was possible in view of the fact that the roof of the hopper had collapsed, that the boy had been standing on the roof when it collapsed, and was thus precipitated into the cement. The jury returned a verdict of death from asphyxiation caused by inhaling the cement dust.

AS THE USUAL TIME FOR BUSINESS VISITS to India is approaching, the attention of United Kingdom firms is drawn to the facilities which the Trade Commissioner Service can afford to representatives visiting India. Sir Thomas Ainscough, Senior Trade Commissioner in India and Ceylon, and his colleagues, Mr. W. D. M. Clarke, Trade Commissioner at Bombay and Mr. R. B. Willmot, Trade Commissioner at Calcutta are particularly desirous of meeting visitors from the United Kingdom, as they feel that with their organisation they are in an excellent position to render assistance, either to principals undertaking a special mission of investigation, or to commercial representatives who are developing the sale of goods of United Kingdom manufacture in India. The Department of Overseas Trade will accordingly be pleased to provide representatives of firms, contemplating such a visit, with letters of introduction to the Commissioners in question.

ANXIOUS TO ASSIST THE HIGHER EDUCATION of those likely to be engaged in industry in Birmingham and the Midlands, Mr. Albert Edward Hills, of The Gables, Four Oaks, a retired Birmingham tube manufacturer, has offered to defray the cost of an additional Chemical Block for the University of Birmingham at Edgbaston, up to a maximum figure of £45,000. The offer has been gratefully accepted, and Mr. Hills will transfer investments to the University to the value of the amount stated. This generous gift will enable the University to provide urgently needed accommodation for a department that has greatly outgrown the building erected for it twenty-five years ago. Mr. Hills, who is a bachelor, about seventy-two years of age, is well known in industrial circles in Birmingham, but has never taken any prominent part in public life. He was formerly chairman and principal shareholder of the Perfecta Tube Co. until the concern was purchased by Tube Investments (Ltd.) some years ago.

Books Received

Official Publications

Ministry of Agriculture and Fisheries. Bulletin No. 82. Specifications and Methods of Analysis for Certain Insecticides and Fungicides. London: H.M. Stationery Office. Pp. 10. 3d.

Report of the Food Investigation Board for the Year 1933. Department of Scientific and Industrial Research. London: H.M. Stationery Office. Pp. 248. 4s.

Company News

John Oakey and Sons.—An ordinary interim dividend of 2½ per cent., less tax, is announced, payable on September 1.

Boots Pure Drug Co.—The directors have declared a quarterly interim dividend of 6 per cent., less tax, payable on September 30 to ordinary shareholders on record on September 1.

Amalgamated Zinc (De Bavay's), Ltd.—A net profit of £3,003 is announced for the half-year to December 31 last. This compares with £3,725 for the latter half of 1932, and with £3,105 in the first six months of 1933.

New Companies Registered

B. A. Smith and Co., Ltd.—Registered August 18. Nominal capital £2,400. To acquire the business of a chemical merchant carried on by Benjamin A. Smith, at 107 Upper Thames Street, E.C.4, and to carry on the business of manufacturers of and dealers in chemicals, gases, drugs, medicines, plaster of Paris, plasters, disinfectants, etc. Directors: Benjn. A. Smith, Woodbury, Snakes Lane, Woodford Green, Essex; Arthur P. Smith, Robert L. Smith.

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).

Norway.—An agent established at Oslo wishes to obtain the representation of United Kingdom suppliers of china clay.

British India.—A firm of manufacturers' representatives in Bombay desire to obtain the representation of United Kingdom manufacturers of sanitary fluid and toilet soap, for the whole of India.

APPOINTMENTS VACANT

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ASSISTANT CHEMIST required for Laboratory and Engineering Works in London. Must be good general analyst and preferably used to work process control whilst some metallurgical experience would be an advantage. Age about 25. Write giving full particulars and salary required. Box 5912 Nelson, Aldwych House, W.C.2.

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CHARCOAL, ANIMAL and VEGETABLE, horticultural, burning, filtering, disinfecting, medicinal, insulating; also lumps ground and granulated; established 1830; contractors to H.M. Government.—THOS. HILL-JONES, LTD., "Invicta" Mills, Bow Common Lane, London, E. Telegrams: "Hill-Jones, Bochurch, London." Telephone: 3633 East.

FILTER PRESS, Dehne, 17 C.I. Plates 24 in. x 24 in. and Frames, with Pump 2½ in. plunger, nearly new condition. C. F. DAVIS, LTD., Hatcham Road, Old Kent Road, S.E.15. New Cross 1147.

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Telegrams: "Russonken, Manchester."
And Bardon Chambers, 13 Infirmary Street, Leeds 1.
Telephone: 26154.

GRINDING of every description of chemical and other materials for the trade with improved mills.—THOS. HILL-JONES, LTD., "Invicta" Mills, Bow Common Lane, London E. Telegrams: "Hill-Jones, Bochurch, London." Telephone: 3633 East.

PATENTS & TRADE MARKS

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PATENTS obtained, trade marks and designs registered, at home and abroad.—GEE AND CO. (Patent and Trade Mark advisers to THE CHEMICAL AGE), 51-52 Chancery Lane, London. W.C.2. Telephone: Holborn 1525. Established 1905.

REGINALD W. BARKER & CO. (Estab. 1886.) Patent and Trade Mark Agents, 56 Ludgate Hill, London, E.C.4. Booklets sent gratis. Phone: City 5140.

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BOYS of good character, well-trained and eager to work, will be gladly recommended by the Warden of the John Benn Hostel, Bower Street, E.1.

ADVERTISERS please note that the latest hour at which we can accept advertisements for insertion in these columns each week is 10 o'clock on Thursday morning.