The Chemical Age

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Notes and Comments

More Chemicals Exported

THE Board of Trade returns for April confirm the impression created by returns published earlier this year that business in the chemical and allied industries is gradually recovering from the depression. Increased exports of chemicals, drugs, dyes and colours indicate increased activity among the producers, while an increase in the value of imports during April may be interpreted as a sign of increased demand among the chemical using trades which did not reveal itself in the earlier three months of the year. The figures published in the returns show a continued rise in the value of chemical exports, the total for the month being £1,635,191, against £1,577,645 for the corresponding month of 1934, an increase of £57,546. For the first four months of 1935 the total was £6,757,448, representing an increase of £532,021 over the same period last year, while a comparison with 1933 shows that the total exports were nearly a million pounds more (actually £944,455).

Chemical imports during April amounted to £936,577, against £866,802 for April, 1934, an increase of £69,775. For the first four months of the year imports totalled £3,714,898, compared with £3,785,548, a decrease of £70,650. In the first four months of the year imports totalled £3,714,898, compared with £3,785,548, a decrease of £70,650. In the first four months of 1933 Great Britain imported £2,943,438 worth of chemical products, so that the current year's figures show an increase of £771,460. It is not without interest to note that while, in the chemical industry, the excess of imports over exports for the four months was £3,794,010, Great Britain's total imports during the four months exceeded her total exports by £81,100,000, which was £14,000,000 less than in the corresponding period of 1934.

The Imperial Institute

QUIET but steady progress in the very valuable work on plant and animal products and mineral resources carried on at the Imperial Institute, South Kensington, is recorded in the annual report of the Director, Sir Harry A. F. Lindsay, who succeeded Sir William Furse upon his retirement last September. Extracts from the report, which we publish elsewhere, give some idea of the wide scope of the Institute's activities and their usefulness to those engaged in chemical and allied pursuits at home and overseas. Each department has an intelligence section, some 1,280 inquiries having been dealt with during the year in the plant and animal products department and 837 (against 635 in 1933, an increase of over 30 per cent.) in the mineral resources department. Of the main groups into which the year's inquiries in the plant and animal products department may be classified probably the most important is that concerned with requests for information as to the commercial position of overseas commodities and the prospects of marketing supplies in this country. The applications are not necessarily concerned with proposals for new local industries; they frequently relate to established industries affected by changing trade circumstances or to undertakings which have passed the experimental stage and need to be directed along the right lines.

The intelligence section of the mineral resources department supplies information mainly of a technical and commercial character not only to Government departments, but also to firms and private individuals both in the United Kingdom and overseas, and for this purpose maintains a technical index containing references to journals and other publications relating to the many aspects of mineral resources. Publications on the mineral industry of the British Empire and foreign countries are prepared by the staff of this section.

Good Team Work

SIR HARRY LINDSAY states in his report that contacts have been maintained and extended with officers of the Colonial services home on leave, and the visits of these officers, their practical suggestions and advice have been most valuable. The High Commissioners for the Dominions and India, and officers, have given the Institute helpful information and assistance in various ways. Through its advisory councils and technical committees the Institute has maintained close touch both with commercial interests in the city and overseas and also with scientific experts, who have contributed a wide variety of knowledge and experience towards the solution of the problems which arise from day to day at the Institute. These problems are received from many sources, official and unofficial; they may focus on specimens, on markets or on processes; they may relate to almost any class of material, whether of plant, animal or mineral. Their successful solution depends on the co-operative effort of the scientists, business-men and administrators represented on the committees and staff. This is team-work in the best and most effective sense of the term and it is concentrated on questions affecting the livelihood of a wide range of Empire producers, at home and overseas. The

actual character of this work, its variety and scope, its appeal to farmer, planter or miner, to merchant or manufacturer, to the school-children visiting the galleries and cinema and to the school teachers accompanying them, may be appreciated from a study of the report.

The Knowles Oven

THE brief account in THE CHEMICAL AGE of April 13 of the Knowles oven is hardly sufficient to convey to the chemical industry the potentialities of this plant. The oven is a brick structure heated from the bottom only having a chamber 30 ft. long, 10 ft. wide and from 2 ft. to 4 ft. high to the spring or crown of the arch respectively. Several of these ovens may be built in a battery and some half-dozen or so batteries are at work. Originally intended for the coking of coal, the uses to which the ovens have been put have been extended greatly so that if the claims made for them are found to be substantiated they will take their place as a piece of purely chemical plant. One such use is for the processing of oil residues, and it was in this field that the oven received its first commercial application. Commercial conditions in the oil industry led to too great an accumulation of heavy fuel oil and it was seen that if by deeper cracking the proportion of motor fuel could be increased, the balance would be improved. The development of this "non-residuum" crackling in which coke was formed with the maximum yield of motor fuel oil was not the complete success it was hoped because the coke was of little value. The Knowles oven was applied for the purpose and produced a coke containing but 1.8 per cent. of volatile matter instead of the 12.5 per cent. produced by other processes; the Knowles coke, in short, did not give a thick smoky flame. Clearly an oven having a very large horizontal surface area and a high crown would be suitable for work of this sort.

In the same way the oven has been successfully applied to the production of pitch coke, and here again it would seem to have suitable applications for which the chemical industry might consider it; an interesting feature of its use for this purpose is that it is not necessary to use the tar still to produce the pitch, but the crude tar can be allowed to flow directly into the hot oven, the base of which may be at 1,350° C. No doubt there would then be some cracking of the lighter fractions of the tar and possibly some formation of naphthalene, and the advisability or otherwise of this would have to be investigated. In some situations it may be desirable to gasify liquids, particularly as a means for equalising production, for example of creosote oil and other by-products, and again it is claimed that the Knowles oven is able to discharge this function. It may with justification be objected that the tendency in fuel oil and chemical treatment to-day is towards greater refinement and more precise control of the products and operations, whereas with a somewhat rough-and-ready "horse-cure" such as would be represented by distillation at very high temperatures, no such control is possible. It is not, of course, entirely certain whether by regulation of the temperatures of the oven floor, the precise degree of cracking may not be controlled, but clearly much work remains to be done upon these and kindred points and the chemical industry, we suggest, will be interested to receive account of the work and to hear something about the economic side of the operation, upon which at present there is no reliable guidance whatsoever.

Utilisation of Steam in Works

A RECENT discussion by the Institute of Fuel prompts us to inquire whether steam and power are used and generated to the best effect in chemical works. It is undoubtedly necessary to consider the use of steam under several different headings. Most chemists are apt to inquire whether the processes under their control are susceptible of improvement whereby the consumption of the several raw materials, among which heat and power may be included, can be reduced. They are also accustomed to inquire whether the process, as a process, operates in the most efficient way. Inquiry into possible mistakes in the utilisation of steam and power, however, demands frequently a knowledge of fuel technology that is the perquiste of the specialist. One prolific source of waste is an uneconomical load factor. Too often processes in different parts of the works are operated simultaneously and throw a heavy load on the power-house and the boilers, whilst at other times all requirements diminish together, making the load factor very small and causing needlessly heavy capital and labour expenditure on plant. Many works generate steam at a high pressure and reduce down for use in the several processes, without making any effective use of the energy so wasted. As a practical illustration it may be cited that a certain works generates steam at 100 lb. pressure, and reduces it to 10 lb. for process work. At the same time this works is purchasing power at ¾d. a unit, whereas it would cost but one-third of this figure if the steam were first reduced to 10 lb. in a non-condensing engine or turbine and the exhaust used for process work.

Too often fuel costs are incorrectly allocated and in this way losses are masked. The true cost of steam for process work is not the cost of generation per 1,000 lb., but the cost per million B.Th.U. delivered at the point of use. It can be shown that, when the exhaust steam can be used, it is cheaper to reduce down by small back-pressure engines and turbines than to buy power from the grid; expressed in another way, by proper utilisation of steam for power and process work combined the generation of current at each works is better than central generation at power stations. The fact is, of course, that, even neglecting the admittedly high cost of distribution, the thermal efficiency of coal utilisation of the modern power station is only of the order of 25 per cent. at its best, whilst the combined use in the manner suggested here leads to efficiencies of the order of 50 or 60 per cent. It is impossible to generalise, since conditions at each works are necessarily unique, but there can be no question that there is an untold amount of overlapping and wastage of national resources. If our costs are found to be high in the international market, how much of it is due to this muddled method of working?

THE Textile Plant Service of the Brazilian Ministry of Agriculture is making use of Paris green and lead arsenate to combat leaf caterpillars of the *Alabama Argillacea* species on cotton plants. Cotton seeds are disinfected of pink boll worms, *Platiedra Gossipyella,* in special chambers with carbon bisulphide, and fumes produced from a mixture of arsenious acid and a sulphurous anhydride are diffused from various types of apparatus as a fumigant against "sauva" ants of the *Atta Sexdens* species.

The Work of the Imperial Institute

An Outline of the Past Year's Investigations

THAT co-operation between scientists, administrators and business men is an essential to the solution of every-day problems of the Institute, is the substance of the introduction by Sir Harry A. F. Lindsay to his annual report on the work of the Imperial Institute for 1934.

Considerable attention has been devoted throughout the year to problems involved in the production of tung oil from the fruits. The sub-committee on tung oil has distributed supplies of tung fruits to several British firms in order that they might consider adapting their decorticating machines to deal with these fruits. Tests have been carried out, by the courtesy of the British Oil and Cake Mills, Ltd., in the preparation of the oil by means of expellers, and it is clear that this type of press is suitable for the treatment of tung seed. Experiments in obtaining tung oil by extraction of the seed with solvents have been conducted, but, so far, the results have been inconclusive. Samples of tung fruits and nuts (*Aleurites Fordii*) grown experimentally have been received for examination from Australia, Burma and Nyasaland, results showing that tung oil of good quality can be produced in the British Empire. Samples of *Aleurites montana* nuts from Burma, Ceylon and Hong Kong were also examined and found to be of satisfactory character.

Essential Oils and Resins

The Committee on Essential Oils and Resins considered Imperial Institute reports on geranium and other essential oils received from the Senior Agricultural Chemist in Kenya, and furnished observations as to the extent to which the production of geranium and peppermint oils could be developed without detriment to the market. A report of the progress made during the year under the scheme of lac research in the United Kingdom sanctioned by the Government of India was presented by Mr. A. J. Gibson, Special Officer, Lac Inquiry, to the Sub-Committee on Lac. The committee was informed of the nature of the investigations carried out by the appointed Indian research workers at the Paint Research Station, Teddington, at the research laboratories of the British Thomson-Houston Co., Ltd., Rugby, and at the Plant and Animal Products Laboratories of the Imperial Institute. The preliminary work accomplished has proved most promising and Mr. Gibson informed the committee that arrangements have been made for co-operation in lac research to be maintained between the New York Shellac Research Bureau, the Lac Research Institute in India and the research workers in the United Kingdom.

Investigations Section

The Investigations Section undertakes the chemical and technical examination of Empire raw materials, this work being carried out in consultation with the Advisory Council and its technical committees. During 1934, reports were furnished on 520 samples, which were submitted chiefly by Agricultural and Forestry Departments overseas and by representatives of Dominion, Indian and Colonial Governments in London. Investigations were also carried out for the Colonial Office, the Royal Botanic Gardens, Kew, the Empire Cotton Growing Corporation, the West India Committee, the Council for Scientific and Industrial Research, Australia, and the East African Agricultural Research Station, Amani.

Among the products examined during the year were sunn hemp from India and Uganda; *Agave amaniensis* fibre from Tanganyika; sisal from India; Hibiscus fibre from the Sudan; coir from Seychelles; Hedychium fibre from British Guiana; ramie from Uganda; kapok from New Guinea, and Bombax floss from Kenya.

Assistance was rendered during the year in connection with attempts made by the Department of Agriculture in Uganda to devise a chemical process for the preparation of sunn hemp. Samples prepared by two methods each involving the use of ammonia and sodium sulphite were examined in comparison with a series of twenty-six samples (representing various modes of preparation) which had been previously investigated One of the samples was found to be of better colour and rather softer than those of the earlier series, while the second material was of lower grade and more closely resembled the previous samples in colour and character. It was suggested that consideration might be given to the possibility of producing material similar to that of the better sample in commercial quantities.

Oils and oilseeds examined during the year included tung nuts and oil from Burma, Cyprus, Nyasaland and Australia; ground-nuts and ground-nut oil from St. Vincent, Kenya and the Sudan; mustard seed from Tanganyika; castor seed and oil from St. Vincent and Nyasaland; coconut kernels from Seychelles; candle-nuts and Ximenia nuts from South Africa; olive-oil soap from Palestine. Essential oils submitted for examination included geranium oils from South Africa, Northern Rhodesia, Kenya and Ceylon; lemon-grass oils from Kenya, Uganda and Seychelles; Cymbopogon, Zanthoxylum and peppermint oils from Kenya; Æolanthus oil from Northern Rhodesia, Kenya and Ceylon; lemongrass oils from bark oils from Seychelles; Ocimum oils from Seychelles and the Sudan; lime oil from Trinidad; and pimento leaf oil from Jamaica.

Reports were furnished on 14 samples of gums and resins, including frankincense and myrrh from Kenya, an oleo-resin from Kenya; Wallaba resin from British Guiana; and Periploca gum and tragacanth from India. Two samples of myrrh from Kenya were, on chemical examination, found to conform in all respects to the requirements of the British Pharmacopœia for medicinal myrrh.

A sample of gum tragacanth from North-West Frontier Province, India, was found to be inferior in quality to a good commercial sample of the Persian gum and would not satisfy the requirements of the British Pharmacopœia for pharmaceutical tragacanth; it could, however, be used for technical purposes.

Drugs and Insecticides

Samples of drugs and insecticides investigated during the year included aloes from the Sudan; papain from Palestine; Mundulea roots from South Africa; Dolichos tubers and Solanaceous plants from Kenya; Psyllium seeds from Cyprus; derris roots from Seychelles; and Artemisia plants from Kenya and the United Kingdom. The Institute examined twenty-seven samples of *Artemisia maritima* and *A. gallica* plants from the British coasts, the yields of santonin ranging from a trace to 1.3 per cent., the latter figure being given by a sample of *Artemisia maritima* from Norfolk. Six other samples of this species were found to contain 0.5 per cent. or over. The Department of Agriculture in Seychelles submitted a sample of roots derived from *Derris malaccensis* plants approximately 18 months old. The material was found to contain 2.8 per cent. of rotenone as recrystallised from alcohol, and 3.3 per cent. as calculated from the carbon tetrachloride compound; it also gave 15.8 per cent. of total ether extract.

Among inquiries answered by the Intelligence Department was one from a leading firm of chemical engineers who had been asked to quote for a plant for the preparation of rotenone from cube root. They were supplied with information with regard to the nature of cube root and the toxic principle rotenone which it contains and which is used as an ingredient in certain insecticides: the methods of extraction of rotenone were discussed and the question of a suitable solvent for the purpose was dealt with. Publications containing articles on the extraction of rotenone and general information on cube root were brought to the firm's notice. Another inquiry came from a firm of merchants in this country who had been offered a quantity of Xanthorrhea resin from Tasmania and desired information with regard to the possibility of utilising the material. The employment of the material as a substitute for shellac in the preparation of cheap varnishes, lacquers, wood stains and polishes was mentioned and it was pointed out that its technical properties were not such as would enable it to replace shellac satisfactorily for the best class of work. A memorandum, prepared at the Imperial Institute, dealing with the position with regard

to the resin and the principal obstacle to its more extended use, was also furnished.

The chemical and mineralogical laboratories, which include sections for conducting assays, brick, tile and pottery investigations and cement-testing, carried out analyses, technical trials, etc., as well as commercial valuations of samples sent from many parts of the Empire. Reports were made on 115 investigations, involving the examination of 393 samples.

A chemical analysis of tantalite, which had been sent by the Geological Survey Department of Uganda, showed the presence of tantalic oxide, 41 per cent.; niobic oxide, 23 per cent.; and tin oxide, 15 per cent. Material of this composition would not be saleable under present conditions, and it was suggested to the sender that an effort might be made to render the material marketable by removing as much as possible of the tinstone. Information was given to the Geological Survey Department concerning the requirements of purchasers of tantalite in regard to chemical composition. Three samples of columbite, representing the ore now being shipped from Nigeria to the U.S.A., were sent by the Geological Survey Department, Nigeria, for analysis, in order that the value of the material might be ascertained, and information supplied regarding its possible uses. Chemical analyses carried out at the Imperial Institute showed that the principal constituents of the samples ranged between the following percentage limits: niobic oxide, 50 to 57; tantalic oxide, 5 to 13; tin oxide, 0.2 to 6.2; titanium dioxide, 7 to 12.

The preferential tariffs in the United Kingdom in favour of Empire minerals and the desire of producers to extend their markets led inquirers in several Empire countries to ask regarding the possibility of exporting gypsum to the United Kingdom in competition with the material obtained from domestic sources and that now imported from the Continent. Information was supplied regarding the quantity imported, demand, prices and grade required by consumers. Interest continues to be shown both in regard to the possible utilisation of beryl and in the production of metallic beryllium, but so far as can be ascertained the only active commercial work on the latter subject is being carried out abroad. A number of inquiries have been dealt with on both of the above aspects of the subject. A London firm of manufacturing chemists was given information regarding the occurrence of vanadium ore in the above countries, the nature of the product marketed and a list of companies working the deposits.

An inquirer, who was exploring the question of producing metallic aluminium in Australia, was supplied with information with reference to the costs of production, the requisite plant and the quantity of power consumed. He was also put into touch with a consultant in the United Kingdom who might be able to give advice on the matter, while a firm in the United Kingdom who were contemplating the erection of a plant for the production of metallic magnesium were furnished with information regarding sources of supply of magnesite within the Empire, including the names of producers in India, Canada, Australia and South Africa.

International Nickel Co. of Canada

Net Profit for March Quarter

A NET profit of $4,917,627.24, equal to 30 cents per share on the common stock after allowing for preferred dividend, is reported for the first three months of 1935 in the quarterly statement of the International Nickel Co. of Canada, Ltd. This compares with a net profit of $5,049,275.91 in the corresponding quarter of 1934, which was equal to 31 cents per share on the common stock. During the first quarter of 1935, cash was increased by about $3,240,000 to a total of $22,031,652.48 on March 31.

As anticipated from the remarks of Mr. R. C. Stanley, president, at the annual meeting of the company on March 26, announcement was made recently that the 5½ per cent. mortgage debenture stock of the Mond Nickel Co., Ltd., will be redeemed in its entirety on August 1 at 103 and interest. The amount of this stock outstanding on March 31 was £1,089,908. The dollar cost of retiring the debentures of International Nickel's subsidiary in Great Britain will depend on the exchange rate then prevailing. In his accompanying letter to shareholders, Mr. Stanley points out that they number "almost exactly ten times the total number of employees required to carry on all the company's varied activities."

Dyestuffs Output in the United Kingdom

A Slight Decrease in Production in 1934

FROM returns furnished by the principal British dyestuffs manufacturers the Board of Trade has compiled a statement showing the quantities of the main classes of dyestuffs which were produced in the United Kingdom during 1934 and the total production of dyestuffs for each of the past thirteen years.

The figures, which have been published in the "Board of Trade Journal," show a slight decrease in production in 1934 compared with the previous year, the total for the year being 52,925,636 lb., against 52,944,866 lb. in 1933. In 1922 the total production was only 23,832,967 lb. The figures are as follows:

PRODUCTION OF SYNTHETIC ORGANIC DYESTUFFS IN THE UNITED KINGDOM DURING THE YEAR 1934.

Category.	Blacks.	Blues.	Browns.	Greens.	Oranges.	Reds.	Violets.	Yellows.	Total.
	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
Direct cotton dyestuffs	2,987,450	1,534,009	1,032,164	191,132	522,809	1,156,008	139,441	1,547,288	9,110,301
Acid wool dyestuffs	1,963,087	1,902,186	242,798	532,219	1,128,891	2,245,154	763,283	1,522,306	10,299,924
Chrome and mordant dyestuffs (including alizarine)	2,483,329	537,190	925,210	16,962	254,350	2,436,005	16,402	398,409	7,067,857
Basic dyestuffs	—	538,877	286,144	281,863	172,590	720,950	471,326	619,337	3,091,087
Sulphide dyestuffs	5,917,167	606,050	1,000,014	124,430	17,941	6,912	—	50,751	7,723,265
Vat dyestuffs (including indigo)	225,144	5,138,539	410,344	1,301,778	275,335	311,320	219,427	188,542	8,070,429
Lake-making and pigment dyestuffs	110,951	15,825	1,173	194,313	1,736	1,450,815	—	144,748	1,919,561
Cellulose acetate silk dyestuffs ..	307,980	893,571	—	2,547	109,383	117,372	142,345	149,650	1,722,848
Oil, spirit and wax dyestuffs ..	388,668	640,641	16,991	1,878	21,078	29,363	11,478	44,184	1,154,281
Unclassified	99,672	38,288	96,868	7,684	2,289	18,879	2,432	53,581	*2,766,083
Aggregate total	14,483,448	11,845,176	4,011,706	2,654,806	2,506,402	8,492,778	1,766,134	4,718,796	52,925,636

* Including quantities not separately distinguished.

SUMMARY OF PRODUCTION OF SYNTHETIC ORGANIC DYESTUFFS IN THE UNITED KINGDOM, 1922-34.

Year.	Total.	Year.	Total.	Year.	Total.	Year.	Total.	Year.	Total.
	Lbs.		Lbs.		Lbs.		Lbs.		Lbs.
1922 ..	23,832,967	1925 ..	32,693,402	1928 ..	50,960,472	1931 ..	8,621,073	1934 ..	52,925,636
1923 ..	33,100,719	1926 ..	30,297,000	1929 ..	55,785,032	1932 ..	49,380,266		
1924 ..	33,242,704	1927 ..	39,551,756	1930 ..	42,590,243	1933 ..	52,944,866		

Letters to the Editor

The Part Played by Chemistry in Modern Atomic Science

SIR,—In his interesting article, "Chemical Personalities, 1910-35" (THE CHEMICAL AGE, May 4, pp. 397-8), Professor Armstrong discusses with great courage and insight the character of many of the great chemical pioneers of the last 25 years, and while we all realise that, especially in such a field, human judgments can never be infallible, very many chemists no doubt are, like the writer, grateful to him for his outspoken articles. Without entering into personalities at all, the great change for the worse which, during the period he reviews, has come over scientific ethics could not be better illustrated than by the calculated and persistent efforts of ambitious schools of physicists to secure to themselves the whole credit for the great advances in our knowledge of the nature of the atom of the present century, with how great success is shown by the subject being invariably called atomic physics rather than atomic chemistry. Yet in the whole story right up to the present time, chemistry and chemists have played as crucial and important part as physics and physicists. Whether or not it is because the chemist working in these fields more readily appreciates at their full importance the contributions of the physicist, and has, perforce, to know far more about physics than the physicist has to know about chemistry, or whether it is to be ascribed, as Professor Armstrong suggests, to the primitive instincts of the swashbuckler and freebooter, becoming a recognised weapon in the field of strife which scientific investigation, alas! has become, it surely is time for chemists to make a united stand against their own cattle being raided with impunity and driven over the border. For lack of subtle periodic advertisement, probably not one in two of the older chemists, nor one in ten of the younger generation, knows the key part their own science has played in these advances.

No better illustration could be cited, both of the fact and of the method by which this type of one-sided warfare is pursued, than the case of H. G. J. Moseley, who, in Professor Armstrong's words, "came to lead us into a promised land of simply related 'atomic numbers.'" Far be it from me to wish to reduce by one iota the prevailing estimate of Moseley's powers or of the greatness of the tragedy that overtook science when his life was sacrificed at Gallipoli. But Moseley's exact connection with atomic numbers was precisely the same as that of Aston with regard to isotopes—he extended a conception originating in radio-chemistry, beyond the range of the radio-elements to the whole or to the greater part of the elements of the Periodic Table. Aston has been meticulously careful, almost over-generously so, to make this known, and Moseley, had he survived, would doubtless have done the same. Both were by training chemists, Moseley having graduated in the Honour School of Chemistry at Oxford, before he went over entirely to physics.

The original suggestion that the places in the Periodic Table correspond with successive integral values of the atomic charge was due to van der Broek, who, in a brief and not very clear letter to "Nature" (July 11, 1911), on the then prevailing estimate of the number of electrons in the atom as half the atomic weight, suggested this in conjunction with Mendeleff's "cubic" periodic system, containing 120 places. This idea he developed in the "Physikalische Zeitschrift" (June 15, 1911), attempting so to accommodate the too numerous radio-elements, for which the ordinary Periodic Table is too short. Even in the light of the knowledge of the chemistry of the radio-elements of the time, the attempt was manifestly fanciful.

The modern conception of atomic number really originated in the Displacement Law of Radioactive Change, which is a purely chemical law concerning the change of chemical character suffered by the element after the expulsion of the helium atom and the electron respectively, dating as regards the first to a book I published early in 1911, "Chemistry of the Radio-Elements," and, as regards the second, to papers published by A. S. Russell, G. von Hevesey, K. Fajans and myself in the early months of 1913. It was due entirely to the work of chemists, principally to the researches of Alexander Fleck, who shortly afterwards went over into chemical industry. In the "Jahrbuch der Radioaktivität und Electronik," 1913, p. 193, under the title "Die Radioelemente und der Periodische Gesetz," I published a diagram showing the sequence of elements from uranium to thallium, covered by the sequence of radioactive change, as differing by unit charge. This is eight months before Moseley's first paper on the subject which appeared in the "Philosophical Magazine" of December, 1913.

Just before it appeared, van der Broek, in a second communication to "Nature" (November 27, 1913), modified his suggestion by applying it to the ordinary Periodic Table, to which the more exact data as to the value of the nuclear charge conformed. This charge is not equal to but less than half the atomic weight. Commenting on this (*ibid.*, December 4), I cited the support given to his idea by the Displacement Law and proposed the word "isotope" as meaning elements occupying the same place in the Periodic Table because they have the same atomic number. Moseley's paper appeared between these two letters.

My letter was followed by one from Professor Rutherford in the next issue (*ibid.*, p. 423), drawing attention to Bohr as having made use of van der Broek's suggestion in his theory of the constitution of the atom in the September number of the "Philosophical Magazine" of that year, and to Moseley's paper in the December number as "the strongest and most convincing evidence" in support of it. Apparently physicists have continued to think so, which is natural enough, as they can hardly be expected to appreciate the meaning of chemical evidence, knowing little of the subject. But it is irritating to find chemists equally misinformed. In this case the attempt to subordinate the prior chemical evidence was so barefaced that I attempted a feeble protest (*ibid.*, p. 452). But, ever after, that development has been universally accounted to the credit of the Bohr Theory of the Atom, and Moseley's spectroscopic work as interpreted by it. As for the former, Bohr's first paper on the Constitution of Atoms and Molecules appeared in the July number of the "Philosophical Magazine," for 1913, giving a general account of his application of the quantum idea to the explanation of spectrum lines, and his second paper contained references both to van der Broek's "Physikalische Zeitschrift" paper and to those containing the Displacement Law. which he describes at length. Here, as so often with the work of the mathematical physicist, he was incorporating perfectly well-known experimental results into his mathematical theory, but is vulgarly credited and does nothing to correct the inversion, with evolving the results out of the theory.

So one might go on *ad nauseam*. The whole discovery of radioactive change was blatantly heralded as a triumph of the Electrical Theory of Matter. But can any chemist in his senses suppose that such a theory as it then was, which literally made no distinction between a transmutational change and the rubbing of a piece of sealing wax, could produce any such result?—Yours faithfully,

FREDERICK SODDY.

131 Banbury Road,
Oxford.

[LET me at once plead guilty to Professor Soddy's criticism. My reference to Moseley was obviously penned in a romantic vein, not upon a strict analysis of the evidence but rather as a quotation, perhaps too literally, from the gospel according to Saint Rutherford. However, I think I was right in deriving my stairway picture from Moseley. In fact, it is difficult for a rank outsider like myself, in this field, to grasp all the evidence and be historically sound: a Soddy was called for to interpret the writing upon the wall. Fortunately, he responds to the call. Let me here correct a misstatement in my article (THE CHEMICAL AGE, May 4, p. 297). In the section "Our symbolic system," the sentence "optical isomerism was in every way to the fore" should read "*was not* to the fore."—H.E.A.]

THE Costerfield Smelting and Refining Co., in Victoria, recently commenced the manufacture of antimony oxide. The annual capacity of the new plant is about 15,000 tons of antimonial residues, having an antimony content of from 5 to 10 per cent. Another new development is the manufacture of titanium white pigments in a plant to be built shortly in Little Burleigh, Queensland.

Nickel Alloy Manufacture at Birmingham

Centenary of Henry Wiggin and Co., Ltd.

Melting High Nickel Alloys in the electric furnace at Wiggin Street Works.

LORD WEIR OF EASTWOOD presided at a luncheon given at Birmingham on May 17 as part of the centenary celebration of Henry Wiggin and Co., Ltd., a subsidiary of the Mond Nickel Co., Ltd. The company included Dr. E. L. Burgin, M.P., Lord Melchett, Sir Felix Pole, Mr. Robert Stanley (president of the International Nickel Co. of Canada), Mr. D. Owen Evans, M.P., Mr. Geoffrey Lloyd, M.P., and the Lord Mayor of Birmingham.

Henry Wiggin and Co. are the largest manufacturers of nickel and nickel alloys in the British Empire. The founder of the firm was Charles Askin, a veterinary surgeon, who had noted some indifferent specimens of German silver while travelling in Europe, and having a taste for scientific experiment he returned home determined to produce a better product. Charles Askin and Brooke Evans, who controlled the commercial side of the business, began in a modest way in George Street Parade, Birmingham, under a sign which read "Nickel Refiners and German Silver Manufacturers." From this humble beginning has grown one of the largest and best-equipped rolling mills in Europe for nickel alloys, now at Wiggin Street, Birmingham.

Some Early Problems

The raw material which Askin first used for obtaining his nickel was a nickel speiss residue from the Pottery district of Staffordshire. There was very soon a shortage of this raw material and the new firm was faced with serious difficulties as a result. Askin obtained some arsenical nickel-cobalt ore from the Carpathians, but he at first found it impossible to separate the nickel from the cobalt. There then occurred one of those fortunate accidents which have so often changed the course of scientific history. It was suggested to him by White Benson, the father of the late Archbishop Benson, that it might be possible to precipitate the metals from their ore by the addition of bleaching powder. Both men arranged to try the experiment separately on the same day. Benson had access to whatever bleaching powder he required, but his attempt was marked by failure. Askin, on the other hand, found to his annoyance that he had been supplied with only half the quantity he had asked for. Exasperated, he flung this amount into his retort and was unexpectedly rewarded by obtaining a precipitate of cobalt sesquioxide. The green solution above it contained the nickel and it proved easy to precipitate this with ordinary lime. This fortunate chance set the firm on a sound footing. Not only was this method technically and financially successful in providing refined nickel of high quality, but it revolutionised pottery ornamentation in also providing pure cobalt. Hitherto, only impure cobalt had been available and the blues so produced were dull and greyish. With the oxide of cobalt obtained from Askin's experiment new clear colours became available, ranging from pale grey to deep purple and famous pottery firms, including that at Sevres, obtained their blues from Birmingham.

Nine years later, Henry Wiggin, a woollen draper, forsook his apprenticeship to that trade, and at the age of 18 entered the business of nickel refining under Charles Askin and Brooke Evans. He entered the firm at a particularly favourable time. Among other things, Elkington's discovery of the possibility of commercial electroplating was increasing the demand for "German," now "nickel," silver and it was decided to remove the refining side of the business to larger premises. On Birmingham Heath, which is now Wiggin Street, there were buildings occupied by Brandeis, a competitor, who, by copying the process of Askin and Evans, had hoped to profit. He was entirely unsuccessful in his venture, but after his business had been purchased by Askin and Evans young Wiggin recovered the equivalent of the entire purchase price from the discarded slag left there by Brandeis.

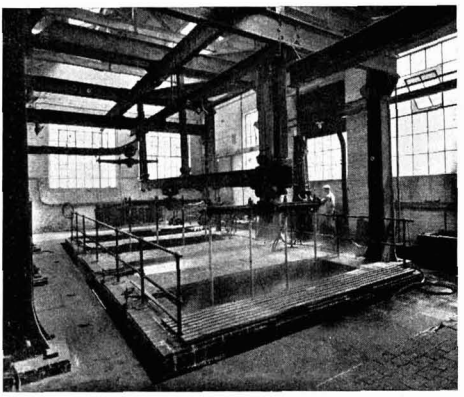
Henry Wiggin in Sole Charge

In 1847, just as Askin was about to retire, he died in Gusdal, Norway, whither he had gone to make inquiries concerning nickel ore deposits in that district. In his will he remembered Henry Wiggin favourably, and the following year the young man, at the age of 24, was taken into partnership by Brooke Evans. Fourteen years later Evans died and within a year or two Henry Wiggin was in sole charge of the business. In 1901, Sir Henry Wiggin, Bt., as he subsequently became, celebrated, with Lady Wiggin, their golden wedding. Four years later he died at the age of 81.

In 1888, Henry Wiggin and Co., Ltd., bought the red lead business of Thomas Adkins, at Smethwick. They continued to manufacture red lead, but, in addition, erected there cupola and reverberatory furnaces for smelting nickel and cobalt ore. Some years afterwards, when the demand arose, tin oxide was also made here, the plant being operated entirely by German workers. Between 1890 and 1900, part of the land and buildings at Smethwick was loaned to Dr. Ludwig Mond, the inventor of the Mond process of nickel refining, and the first carbonyl nickel to be produced on an industrial scale came from this model plant.

The twentieth century dawned prosperously for Henry Wiggin and Co., Ltd. Hitherto, the rolling of their alloys had been undertaken by the Bromford Mills, but in 1905 they

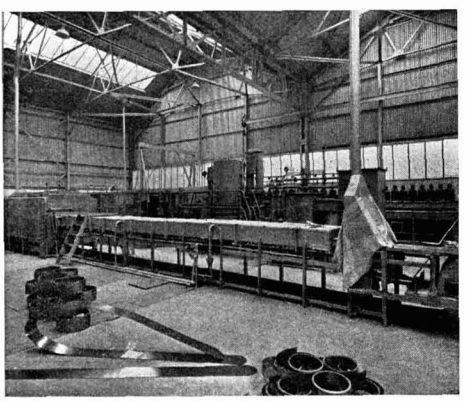
purchased this business and moved the individual mills to Wiggin Street. Here they also put down a hot-rolling mill. Immediately prior to the beginning of the war the development of electrical resistance alloys was very rapid and great



The Pickling Shop at the works of Henry Wiggin & Co., Ltd.

strides were made. In this period there were laid down several new wire mills, improved types of annealing furnaces, and draw benches for the production of profiles and sections. The Wiggin rolling mills at this time also took part in pioneer work relating to Duralumin, which was to become such an important development in the light alloy field.

After the war, the supplies of raw material became uncertain and competition in the nickel market grew stronger, due to the growth of the Mond Nickel Company and to large imports of American nickel. Conversations between the Mond Nickel Company, Ltd., and Henry Wiggin and Co., Ltd., took place and the two subsequently became associated. This association has been remarkably successful, and the works at Wiggin Street, Birmingham, has now one of the best-equipped nickel alloy mills in Europe. A great variety of work is undertaken in connection with the production of finished and semi-

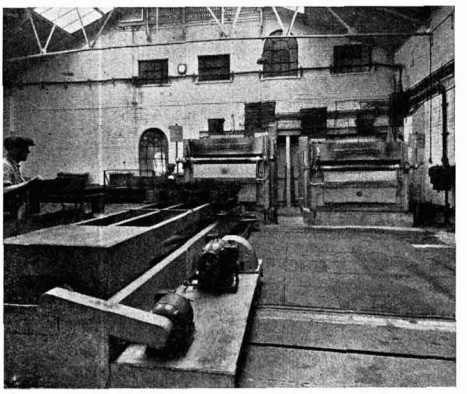


The Butane Gas Plant.

finished manufactures in nickel and its alloys, of which the production of nickel anodes, electrical resistance alloys and spoon and fork blanks are amongst the most important. The resistance materials manufactured are the well-known nickel-chromium alloy (" Brightray "), the nickel-chromium iron alloy (" Glowray "), the nickel-iron alloy (" Dullray "), and the copper-nickel alloy (" Ferry ").

In these works the cold-rolling mills receives much of its material from the hot-rolling mill, but there are some alloys, mainly nickel silvers, which are entirely cold-rolled from the ingot stage in this present department. The heavy breaking-down or " getting ready " mills are the first to handle the heavy hot-rolled sheets, after which they are annealed.

In the annealing shop, which adjoins the cold mill, the bright-annealing of Monel metal and nickel sheets is carried out in electric furnaces provided with a butane atmosphere. These furnaces supplied by Birmingham Electro Furnaces, Ltd., and only recently laid down, have resulted in a greatly improved finish on the sheet products. The butane is supplied from cylinders which are housed in racks against the wall. The gas, when let into the furnace, prevents the sheets from oxidising. The sheets themselves are carried through the furnace on an endless woven belt of nickel-chromium-iron (Glowray), an application which ably demonstrates the heat-resisting properties of this alloy. An inspection of the entry-end of the furnace reveals a most interesting method of keeping the gas within the furnace; Monel metal chains hung

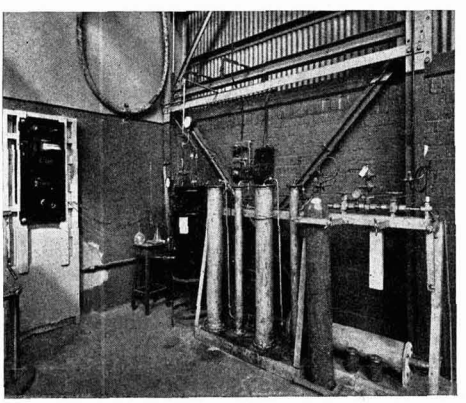


Annealing Furnaces attached to the Cold Rolling Mills, showing moveable charging platforms.

from two horizontal rods, something after the fashion of a bead screen, prove sufficient to prevent any extensive leakage.

The hot-rolling mill may be regarded as the centre of production operations. This mill is one of the largest non-ferrous mills in existence. Hot slabs of metal pass through the continuous rolls and finally assume the thickness required.

There are many interesting processes going forward in the main mill. One which never fails to attract notice is the production of the excellent finish on cast iron or cast steel rolls. This is done by a roll grinder employing finely-ground green buffing powder and working to an accuracy of 1/10,000th of an inch. Another machine—the square-turning lathe—removes the faulty metal at the corners and on the faces of the rectangular cast ingots of oxidised nickel for depolarised anode production. In the fettling shop, pneumatic cold



The Ammonia Cracking Plant.

chisels are engaged in removing the corners and edges from bars of 80/20 nickel-chromium, etc., before they are passed to the rod mill. This process permits of a ready search for possible faults which must be very carefully eliminated as

a fault in the hot-rolled bar has a habit of persisting through the process of wire drawing. "Fettling," as it is called, is necessary with such a hard alloy in order to facilitate its passage through the dies and to save wear, and to make absolutely certain that the finished product will be sound in every respect.

From the fettling shop the bars are passed to the rod mill, to be hot-rolled to size and coiled for the wire department. Depolarised anodes are also produced in this department, the metal being rolled to oval section, cut to length and finally drilled and tapped to receive the nickel hooks by which the anodes are suspended. From the rod mill the rods pass to the heavy wire mill and thence, if required, to the light wire mill. In the heavy wire mill the metal travels at high speed through the dies.

The Annealing Department

The annealing of pure nickel, Monel metal and copper-nickel (Ferry) wire rods is carried out in an electric (B.E.F.) water seal furnace. The coils are placed in the furnace, the temperature of which varies according to the metal with which it is loaded, and after the required time has elapsed a carrier is lowered into a pit of water containing 3 per cent. alcohol which acts as a cleaning agent. The load is automatically lowered into the solution, quenched and brought to the surface again. Nickel-chromium wire rod is "open-annealed" and pickled prior to coating with a special alloy which facilitates subsequent drawing.

One interesting section of the wire mills is devoted to the production of fine tapes for heating elements. Wire of an appropriate gauge is passed through hardened steel rolls to flatten it and by a repetition of this process the required thickness is obtained. One machine in the fine wire mill appears to be running with no load, and even a close inspection of the die at the point where the lubricant comes from the jet reveals nothing to the eye. It is not until a finger is placed behind the jet and gently drawn forward that the fine wire which is running through the dye is noticeable and even then it can scarcely be seen. To anyone unfamiliar with wire drawing it appears extraordinary that a solidly-built high-speed machine, with only occasional inspection, should be capable of handling wire with a diameter of only 0.001 inch. In this department continuous wire strand bright-annealing furnaces are responsible for the recent improved bright finish characteristic of electrical-resistance products. There is also a special metallic-coating plant for wire.

Water plays a big part in the many processes at these mills. Most of the nickel silver ingots are cast in water-cooled moulds and water is used for the cooling of arc furnace electrode holders, rolling mill bearings, the cooling chambers of the bright-annealing furnaces, the rolling of metal under water sprays, the rinsing of pickled sheets, etc. Nearly 23,000,000 gallons of water were used in 1931, but in 1934 the demand rose to nearly 45,000,000 gallons. The artesian well, which has just been completed, should therefore effect considerable economies in production expenses; this well has a depth of 503 ft. and is capable of delivering 15,000 gallons of water per hour.

The Pickling Shop

The pickling shop affords another instance of the excellent resistance to attack by acids of the 80-20 nickel-chromium alloy, Brightray. Here the Taylor pickling machine crates are constructed of this metal and were first installed over two years ago, since when they have been used daily and have handled about 30 tons of material each week. An inspection of the crates and baskets reveals that even the oxide coating has not yet been attacked and the whole installation appears likely to last for an indefinite period. For general purposes, straight sulphuric acid is used, but for the pickling of Monel metal, where complete scale removal is required, a mixture of sulphuric acid and sodium nitrate is used.

In the electrical substation special load requirements have led to unconventional features being introduced, while in other cases a deliberate break from tradition has been observed. For the low-tension connections between transformers, for example, bare copper wires encased in sheet steel trunking have been employed instead of cables. The main points about the design of the station are elasticity of switching arrangements, adaptability to extreme variations in load conditions, the ensurance of a continuity of supply, easy access to cables and switchgear, arrangements for facilitating the moving of heavy parts, the provision of extra feeders as and when required, without the necessity of disturbing existing circuits, the complete enclosure of all line metal, both high tension and low tension, adequate protection of circuits subjected to heavy peak loads and the ability to deal with very heavy currents. The capacity of the station is 6,000 kVA, which can be increased by 25 per cent. There are four transformers supplying 1,500 kVA which supply 11,000/400 volts at 50 cycles. The distribution is 3-phase, 400 volts at 50 cycles for both power and furnace requirements.

The number of motors in the works, excluding fractional h.p. motors, is 300, with a total rating of 6,700 h.p.; the number of furnaces is 24. Current consumption increased from 2,700,000 units in 1931 to 6,100,000 units in 1934.

Up-to-Date Laboratories

The laboratories maintained by Henry Wiggin and Co., Ltd., are of vital importance not only to the works but also to the customers of the firm. Here the investigation of all new developments in the manufacture and uses of electrical resistance materials, rolled nickel, Monel metal, and other nickel-alloy products are undertaken, and it is here that every coil of wire and tape is thoroughly tested against research standards before being sent out. Adjacent to the laboratories is the department which specialises in the polishing of diamond dies. These are polished and opened out through the range 0.002 to 0.0226 inch and tungsten carbide dies are polished and opened in the range of 0.0253 to 0.25 inch.

In the nickel anode casting shop a 10-cwt. Heroult furnace is installed, complete with casting pit. After casting, the anodes have the edges trimmed on a carburundum wheel, the holes are drilled for the hooks and the casting is then sand-blasted. The main melting department is equipped with two Heroult electric "arc" furnaces and one Ajax-Northrup high-frequency induction furnace. Nickel-chromium alloys are melted in the high-frequency furnace and the charge consists of high-purity nickel pellets and high-grade low-carbon chromium. Nickel-chromium iron, nickel-iron and nickel-copper alloys are also melted in the high-frequency furnace.

We are indebted to Mr. I. A. Bayley, general manager of the company, for showing us round the works and for the information upon which this article is based.

B. Laporte, Ltd.

28th Annual Report

IN their 28th annual report for the year ended March 31, 1935, the directors of B. Laporte, Ltd., state that buildings, plant and machinery have been maintained in efficient working order, and additions and improvements have been made during the year. The subsidiary companies have been successful in their operations. One small subsidiary company, which was merely a distributing agency and which is no longer of any importance to the company, showed a slight loss on its last balance sheet; this subsidiary company, being no longer required, is now in course of liquidation, but no capital loss will be incurred.

The bonus shares issued last year became eligible for dividend as from the first day of April, 1934, and an interim dividend of 5 per cent. on the whole of the issued ordinary share capital of the company was paid on December 1, 1934. During the year further sums in connection with patents have been received, which the directors have credited to capital reserve account; this account is now increased by £1,401 to £2,717. The profit for the year, including dividends and interests received from investments, after charging directors' fees, making provision for depreciation and doubtful debts and providing a sum for obsolescence, amounts to £77,103.

The general meeting of the company will be held at Luton Chamber of Commerce on Thursday, May 30, at 12 noon.

Chemical Imports into Abyssinia

DURING the first six months of 1934, according to the "Chemische Industrie," May 18, Abyssinia imported 109 cwt. of pigments, 121 cwt. of cosmetics, 744 cwt. of toilet soaps, 27 cwt. of medicinal products, 303 cwt. of munitions, and 39 cwt. of matches.

The Royal Society of Arts

By G. K. MENZIES, C.B.E., M.A., Secretary

THE object of the Royal Society of Arts, as set forth by its founders in 1754 and laid down by its Royal Charter in 1847, is "the encouragement of the arts, manufactures and commerce of the country." Obviously, chemistry plays an important part in all these directions, and therefore from its earliest days the Society encouraged chemical research and the application of chemistry to industry. The growing importance of industrial chemistry led to the establishment, in 1874, of a special Chemical Section, for the discussion of subjects connected with practical chemistry and its application to the arts and industries. It continued its work, under the guidance of its secretary, Professor John Millar Thomson, F.R.S., until 1886, when its very success led to its extinction, for it had resulted in the formation of the Society of Chemical Industry in 1881, while the Institute of Chemistry had been established in 1877. In this case, as in many others, the Society acted as a parent body, for numerous institutions which are now great and flourishing owe their origin to the Society of Arts.

Contributions from Famous Chemists

Though the Chemical Section was discontinued, the Society by no means lost its interest in chemistry. Amongst the papers read before it in the last fifty years, a large proportion have been devoted to the discussion of chemical problems. Among contributors are many famous chemists and many valuable applications of science to practical purposes have been made known to the public through the medium of the Society's meetings and its Journal.

During the last five and twenty years the Society has continued to carry out its usual programme of meetings, which number about fifty in the course of the year. At some of these, papers are read and discussed dealing with matters connected with the arts, manufactures and commerce of this country, the Dominions and Colonies, and India; at others, courses of lectures of a more technical nature are delivered. Some of these, notably the courses delivered under the Cantor Trust, have achieved recognition as classics in their subjects, and form a noble monument to Dr. Cantor, whose bequest enabled the Society to establish the series.

Perhaps the most important event in the recent history of the Society from its own point of view was the purchase of its premises in 1922. This house was built for the Society by the Brothers Adam, and has been occupied by it since 1775. The original lease expired in 1867, and this was succeeded by various other leases, the last of which expired in 1904. For a good many years the Society only held its house on a very precarious tenure—an agreement terminable on either side at two years' notice. This situation was obviously unsatisfactory, and it was decided to make an effort to buy the freehold. Some prominent members of the council subscribed about £10,000; an appeal was made and, finally, an anonymous gift of £30,000 enabled the Society to achieve its end. Not only did the council secure themselves in the possession of their ancient and historic home, but they saved for posterity one of the finest masterpieces of those great architects, the Brothers Adam.

A New Departure

An entirely fresh departure was made by the Society in 1927, when it decided to institute a fund for the preservation of ancient cottages. It was felt that whilst there are various bodies to look after our ancient monuments, churches, cathedrals, etc., there is no one specially charged with the care of our old cottages which often are not only extremely beautiful but tell a great deal of the arts and crafts of bygone days. Accordingly, an appeal was issued and about £12,000 was raised. The Society was instrumental in saving the beautiful old Thomas à Becket cottages, near Worthing; Arlington Row, Bibury, and one or two other detached cottages; but in order to give an object lesson to the country and in the hope of inspiring others to save something of the village architecture of the past, it decided to purchase the whole village of West Wycombe, Buckinghamshire. The most expert and sympathetic architectural skill was engaged, and in five years the village was transformed from its tumble-down, insanitary condition into a bright, beautiful and healthy village. It has now been handed over to the National Trust, who will preserve it for ever.

Another important branch of the Society's work which has developed enormously during the last twenty years is that dealing with education. Through its efforts was originated the system of carrying out local examinations from a common centre, which soon after received such full development through the agency of the Science and Art Department. The Society's examinations, founded in 1854, are now the most important examinations dealing with commercial education. The number of papers worked in the year 1931 exceeded 107,000.

From its earliest days the Society has endeavoured to improve design in the artistic industries, one of its very first acts being to offer prizes for designs for textiles. A fresh start was made in 1924 when the council instituted a Competition of Industrial Designs, at which Travelling Scholarships and substantial money prizes were offered by firms, city companies, municipal corporations and others for designs of which they were in need. The competition was held annually for ten years and, during that time, scholarships and prizes of the total value of £11,500 were awarded to young students, craftsmen and designers. The competitions were of an extremely practical nature and were undoubtedly the means of discovering and rewarding a number of promising young designers whose abilities would otherwise have remained unknown, and a good many obtained permanent appointments through the competitions. Unfortunately, the expense of holding the competitions was considerable—during the ten years of their existence they cost the Society upwards of £5,000—and the council were reluctantly compelled to suspend them until help could be obtained from other sources.

Art in Industry

But, if the competitions had to be discontinued, they led indirectly to a further and much more important development. Unwilling to abandon their efforts to improve design in British artistic manufactures, the council approached the Royal Academy with the suggestion of holding an Exhibition of British Art in Industry at Burlington House last winter.* The suggestion was warmly welcomed. A guarantee fund of £15,000 was raised by a number of the Society's Fellows, and the exhibition was opened by the Prince of Wales in January last. For the first time, the Royal Academy showed that it was interested in industrial, as well as fine, art; the fact that it was held in Burlington House caused many people who had hitherto been indifferent to realise the value of design to industry; and a large number of manufacturers and artists, who had been wont to eye each other somewhat askance, were brought to work harmoniously together for the common good. Nor, it is to be hoped, is the exhibition more than a beginning. Already it has led to a conference between the Exhibition Committee, the Board of Trade Council for Art and Industry, and the Federation of British Industries, and a committee has been appointed to co-ordinate the work of existing bodies and to keep in being an organisation for the purpose of dealing with any future exhibitions.

* It is not generally known that the whole idea of exhibitions originated from the Society. The first industrial exhibition of which there is any record was held by the Society in 1761, while the Great Exhibition of 1851 was planned in the Society's Council Room, under the active presidency of the Prince Consort.

A NEW rustproofing process called "Iroplat" has been developed in Germany lately which combines the characteristics of electroplated or galvanised surfaces with those produced by parkerisation or atramentation, but claims the distinction of furnishing complete rust protection without an additional coating of paint or lacquer. The Iroplat process consists in depositing a very fine coating of zinc by galvanic treatment of carefully-cleaned iron and steel objects in an appropriate electrolyte. The appearance of the coating is dull grey with a fine, velvet-like lustre. The coating is so thin that it does not alter the dimensions of the objects.

Progress of the Pharmaceutical Society

Changes During the King's Reign

THERE is a curious parallel between the position of the Pharmaceutical Society twenty-five years ago and its position to-day. In each case an Act relating to pharmacy and poisons had been passed two years earlier. As introduced, the Bill on which the Act of 1908 was based was concerned mainly with providing for the sale of certain agricultural and horticultural poisons by persons other than pharmacists, but, in spite of great opposition, the Society was able to secure the inclusion of clauses regulating the use of titles and the carrying-on of the business of chemist and druggist by limited liability companies. These clauses put an end to a highly unsatisfactory state of affairs which had arisen through a loophole in the Pharmacy Act of 1868. A non-contentious feature of the Bill, but one which removed a difficulty that had been hampering the Society in its educational policy, was the power given to the council to prescribe courses of study to be taken by persons desiring to qualify as pharmacists and to divide the qualifying examination into two parts.

In 1911 the Society was faced with a grave situation created by the National Health Insurance Bill. The original draft of the Bill made no provision for the dispensing of medicines for insured persons to be undertaken by those who were properly qualified to do this work, and it was only in consequence of strenuous efforts by the Society that the Bill was amended to provide for the work being done by or under the supervision of pharmacists.

On the outbreak of the war the Society placed its services at the disposal of the Government and was able to render assistance in a number of ways, including advice in connection with the import and export of drugs; loan of staff to the War Office for medical supply work; arrangements for provision at cost price of medicines to the dependents of persons serving in the Forces; and the investigation in the Society's research laboratories of problems connected with the preparation in this country of medicinal chemicals, hitherto imported, with the use of home-grown vegetable drugs and with the use of chemicals in warfare.

Pharmacy found itself after the war with a large number of persons desiring to qualify, whose studies had been interrupted by war service, and the Society co-operated in a Government scheme for the allocation of these students to training institutions. The number of students was far greater than the facilities available for them. After much negotiation, the Society was able to arrange for the equipment and staffing of a number of technical institutions to conduct pharmaceutical courses, and in this way the need was met. Once established, most of these courses continued in existence and developed into pharmaceutical departments, and at the present time there are some twenty-three institutions approved for giving pharmaceutical training. The problem is now one of redundancy instead of scarcity and it would be an advantage if there were fewer schools with more students in each.

In 1922 the Society instituted a system of branch organisation governing the whole of England, Scotland and Wales, and a conference of branch delegates to be held annually as part of the British Pharmaceutical Conference which, at the same time, was reorganised and brought under the ægis of the Society. There are at present 119 branches. During the last twenty-five years there has been considerable extension and improvement of the Society's publications.

The most important event of the Society during the last 25 years was the passing of the Pharmacy and Poisons Bill in 1933.

Atmospheric Pollution

Comparisons between London and Philadelphia

THE 20th Report on the Investigation of Atmospheric Pollution for the year ended March 31, 1934 (H.M. Stationery Office, 5s. net) published on April 8 by the Department of Scientific and Industrial Research, includes a comparison between the cleanliness of London's air and that of Philadelphia. Measurements of atmospheric pollution made in February and March, 1934, show that in February in Philadelphia the total amount of solid impurities given by the average of ten observing stations was nearly double that of the average of the same number of London observing stations, while in March the total solids deposited at the London stations averaged 34¾ tons a square mile, the figure for the average of Philadelphia's ten stations being 53½ tons per square mile.

The results of observations made at stations to the north and south of Rochdale on the obstruction to ultra-violet and light rays by smoke-laden winds are included in the report. These show that there is a deficiency of ultra-violet and light rays with winds which have blown over the town carrying with them the town's pollution. Visible light rays confirm the results obtained with ultra-violet rays. It is, however, of interest to note that at the south station the deficiency of ultra-violet rays is 29 per cent., but the deficiency of the visible light rays is only 11 per cent.; it may be that this is an indication that ultra-violet rays are more sensitive to the obstructive effect of smoke than the visible rays of light.

The report summarises the results of observations on atmospheric pollution made in co-operation with the Department of Scientific and Industrial Research by 75 municipal authorities, five industrial undertakings, and one agricultural institute. Impurities in the air were measured by deposit gauges, the contents of which were analysed periodically and the amounts of the various constituents determined. Ninety-six of these gauges were in use throughout the country. Taken generally for the whole country the figures for the total deposits show a very slight improvement over those for 1932-33. The following stations, however, show an improvement in all types of deposits:—London: Southwark Park; Garston, near Watford; Glasgow; Victoria Park; Marple; Rothamsted; Salford; Ladywell Sanatorium and Peel Park. The greatest total deposit recorded in any gauge was at Golden Lane in the City of London where impurities are being deposited at a rate of over 640 tons of deposit per square mile per annum. At those stations at which a general average for several years can be worked out, tar deposits, that is deposits of sticky, oily matter from the air, have increased above the average at 21 stations, decreased at 19 stations, while at 10 there has been no change.

Records with the instrument known as the "automatic filter," which indicates the amount of impurity suspended in the air producing smoke-haze, have been made at 13 stations, four in London, five in Glasgow, and one each in Cardiff, Coventry, Kew Observatory and Stoke-on-Trent. Measurements of the concentration of sulphur gases in the atmosphere and its variation from day to day are being made in 12 places. The results show in most cases that there is a decrease in the quantity of sulphur gases in the summer as compared with winter.

"Work on methods for measuring daylight," the report states, "has for the most part been confined to co-operation with a firm of instrument makers who have interested themselves in the manufacture of a new type of apparatus, which will be largely automatic. In this, the light is caused to fall on a photo-electric cell and the resulting current charges a condenser which, when the charge reaches a definite amount, discharges through a neon lamp causing an ordinary four-figure counter to move forward one unit. When perfected, this method should prove a welcome addition to the means at the disposal of the co-operating authorities for estimating the loss of light caused by smoke pollution. The instrument can be fitted with suitable filters so that it may measure either visible or ultra-violet light."

The Institution of Gas Engineers

Progress During 25 of its 75 years' History

ALTHOUGH the Institution of Gas Engineers—which was founded in 1863—celebrated its Golden Jubilee as long ago as 1913, it can look back over the last twenty-five years as a period of virile growth and steadily expanding activity. A glance at the membership records reveals a regular increase—temporarily checked in 1914-1918—from a total of 829 at the beginning of 1910 to 1,525 at the beginning of 1935. Upon its roll of members, the Institution has the honour to include the name of the Prince of Wales, who was elected its only Honorary Life Member in 1925. He and other members of the Royal Family have often indicated their interest in the gas industry by attending its meetings and by inaugurating new gasworks and plant. More striking even than this numerical advance has been the steady widening of the activities of the Institution, which was recognised in 1929 by the grant of a Royal Charter of Incorporation, whereby its basis of membership was revised, its obligations multiplied, and the potentialities of enhancing its prestige and usefulness greatly increased.

Two Important Functions

Research and the accumulation and dissemination of technical information are two important functions of the Institution, in which notable progress has been made during the past twenty-five years. Attention had early been drawn to the desirability of continuous co-ordinated research by the Institution into technical matters affecting the gas industry, and from time to time attempts had been made to collect subscriptions from gas undertakings for this purpose. The largest sum collected in any one year, however, had been only £203, until a special appeal in 1906 met with a response that placed at the disposal of the Institution an assured additional income of about £600 per annum for "investigation, research and other special purposes." The present direct expenditure by the Institution on such work amounts to some twenty times that figure.

In 1907 the Institution Gas Research Fellowship (the present value of which is £200 per annum) was founded for annual award "to a duly qualified candidate for the prosecution of post graduate research in gas chemistry" at Leeds University. A further step of importance was taken in 1910, by the endowment, from a fund subscribed to the memory of the late Sir George Livesey, of a Professorship of Coal Gas and Fuel Industries in the Faculty of Technology at the University of Leeds, the first chair of its kind at any university. From this followed, naturally, the setting up of a Joint Research Committee of the Institution and Leeds University, comprising members of the Institution, the Livesey Professor, and other members of Leeds University. Under a scheme of research and technical organisation introduced in 1934, the research activities of the Institution were co-ordinated in the hands of an Advisory Committee on Research, a Research Executive Committee, and several technical committees—all responsible to the Council of the Institution—dealing with gas appliances, lighting, industrial gas, gasholders, calorimeters, ammonia and effluents, meters, pipes, purifiers, tar, refractories and research in co-operation with Leeds University.

Progress in Education

A further direction in which the Institution can record vigorous growth during recent years is the provision of education for the personnel of the gas industry. As far back as 1887 a system was established whereby assistance was given by the Institution and gas undertakings to local education authorities. Classes in gas manufacture, gas supply and gas fitting were established and annual examinations were held by the City and Guilds of London Institute. Rapid development, however, followed the adoption by the Institution in 1923, with the approval and co-operation of the Board of Education, of a comprehensive scheme for the award of grouped course certificates in gas engineering and gas supply, to be recognised as part qualification for membership of the Institution. This scheme was amended and extended in 1929 and 1933 and has been successfully administered by a fully representative Gas Education Committee with the assistance of district gas education committees.

As the activities of the gas industry continue to become ever more comprehensive, so the Institution is steadily growing in strength and usefulness. The importance of gas in the home, in the public services and in industry is receiving increasing recognition. Less obvious, perhaps, but no less vital, is the value of the gas industry as a factor in national defence, in providing many of the essential raw materials, a value fully appreciated by a former president of the Institution—at the same time Director-General of Explosives Supply of the Ministry of Munitions—the late Lord Moulton. To serve the nation through this great industry is the function and privilege of the Institution, so aptly expressed in its motto: "Assidue exquirendo servire."

India Imports More Chemicals

An Improvement in Industrial Activity

THE senior British Trade Commissioner in India reports, in a survey of the import trade of India during the first nine months of the fiscal year (April to December, 1934), issued by the Department of Overseas Trade, that one of the most remarkable features of the past few years has been the resilience of the heavy chemical trade in face of severe industrial depression and reduced purchasing power. The total imports of chemicals during the nine months under review rose from Rs.195 lakhs* to Rs.207½ lakhs, showing some improvement in Indian industrial activity. No details are available of the countries of origin, but particulars of the total imports are given under each of the principal headings (the corresponding figures for 1933 are given in parentheses):

Acids (5¾) Rs.7¾ lakhs; bleaching powder (6½) 8¼; carbide of calcium (4¾) 5¼; copper sulphate (2¼) 2; disinfectants (5½) 7; glycerine (2½) 3; potassium chlorate (9½) 4½; sodium bicarbonate (6) 5½; sodium carbonate (44½) 43½; sodium cyanide (2) 2; caustic soda (26¾) 32¼; sodium silicate (2) 2; sulphur (brimstone) (15) 12½.

The total imports of drugs and medicines advanced from Rs.139 lakhs to Rs.140 lakhs due to increased imports of miscellaneous drugs. Details of the countries of origin are not available, but the following represent the total imports in each of the principal items: Camphor (17) Rs.15 lakhs; proprietary and patent medicines (24) 28; quinine salts (24½) 23; saccharin (2) 2.

After the severe decline in dyes obtained from coal tar during the past few years it is encouraging to note that the total imports of dyes during the nine months rose from 9,820,013 lb. valued at Rs.151 lakhs to 14,523,283 lb. valued at Rs.210 lakhs. Details of the countries of origin are not available, but the following table shows the total imports from all sources under each main heading:—

Alizarine—Moist—Not exceeding 16 per cent. (2) Rs.1¾ lakhs; over 16 per cent. but not exceeding 20 per cent. (10) 11; exceeding 20 per cent. (3) 4¾; *Congo red* (5½) 11¾; *Coupling dyes of the naphthol group*—Naphthols, rapid fast colours (rapid salts and Bases (22¼) 28; other salts (6) 9¾; *Vat dyes—Indigo* (14) 14¼; other sorts—Paste (3) 6¼; Powder (31) 51; *Sulphur black* (9) 7½; *Metanil yellow* (2½) 4¾.

The total trade in paints and colours fell in quantity from 283,953 cwt. to 258,543 cwt., but rose in value from Rs.52 lakhs to Rs.54 lakhs. It is satisfactory to record that the United Kingdom share rose from 133,807 cwt. (Rs.34½ lakhs) to 138,100 cwt. (Rs.36 lakhs), that of Japan also advanced from 33,465 cwt. (Rs.4½ lakhs) to 36,107 cwt. (Rs.5¼ lakhs), whereas that of Germany fell from 41,112 cwt. (Rs.5¾ lakhs) to 23,827 cwt. (Rs.5½ lakhs). The United States' contribution amounted to 4,149 cwt. valued at Rs.2 lakhs.

The total soap trade fell from 222,986 cwt. valued at Rs.57 lakhs to 186,304 cwt. valued at Rs.54 lakhs. The United Kingdom share fell from 170,835 cwt. (Rs.46¼ lakhs) to 160,325 cwt. (Rs.46 lakhs), while that of all "other countries" fell from 52,151 cwt. (Rs.10½ lakhs) to 25,979 cwt. (Rs.8 lakhs).

* Rupees one lakh (Rs.100,000) = £7,500 at 1s. 6d. exchange; rupees one crore = Rs.100 lakhs = £750,000.

British Overseas Chemical Trade in April

Increased Exports and Imports

THE Board of Trade returns for the month ended April 30 show that the month's exports of chemicals, drugs, dyes and colours were valued at £1,635,191, against £1,577,645 for April, 1934, an increase of £57,546. Imports for the same period were valued at £936,577, against £866,802, an increase of £69,775, while re-exports amounted to £46,718, against £353,570, a decrease of £306,852.

Imports

	Quantities. April 30. 1934.	Quantities. April 30. 1935.	Value. April 30. 1934. £	Value. April 30. 1935. £
Acids—				
Acetic .. .. cwt.	17,084	15,407	26,726	23,557
Boric (boracic) ,,	2,818	1,210	2,774	1,204
Citric .. .. ,,	1,160	1,000	3,236	3,983
Tartaric .. ,,	4,252	3,364	17,703	14,299
All other sorts .. value	—	—	9,494	9,201
Calcium carbide .. cwt.	59,754	89,668	37,669	50,357
Potassium compounds—				
Caustic and lyes cwt.	9,504	13,205	11,151	15,802
Chloride (muriate) ,,	61,444	76,559	25,544	22,520
Kainite and other mineral fertiliser salts cwt.	167,250	187,360	28,052	25,785
Nitrate (saltpetre) ,,	5,675	8,052	5,104	4,491
Sulphate .. .. ,,	17,740	38,799	8,570	13,542
All other compounds ,,	9,658	10,133	14,852	17,739
Sodium compounds—				
Carbonate, including soda crystals, soda ash and bicarbonate cwt.	475	54	171	104
Chromate and bichromate .. .. cwt.	4,051	5,534	5,613	7,434
Cyanide .. ,,	1,402	1,274	3,385	3,000
Nitrate .. .. ,,	48,801	49,933	10,491	11,234
All other compounds ,,	14,634	21,552	11,587	14,531
Other chemical manufactures .. .. value	—	—	182,286	242,678
Drugs, medicines, etc.—				
Quinine and quinine salts .. .. oz.	75,007	117,278	6,666	9,650
Medicinal oils .. cwt.	3,009	3,202	6,929	8,995
Ointments and liniments cwt.	6	8	395	445
Proprietary medicines value	—	—	25,930	35,955
All other sorts .. ,,	—	—	45,624	35,893
Raw or simply prepared value	—	—	33,038	33,713
Finished dyestuffs (coal tar) .. .. cwt.	3,781	3,458	93,689	96,848
Extracts for tanning—				
Chestnut .. cwt.	21,931	33,318	15,399	24,606
Quebracho .. ,,	125,483	43,422	71,879	26,955
All other sorts .. ,,	32,955	28,059	24,693	20,799
All other dyes and dyestuffs .. .. cwt.	496	799	3,470	23,986
Painters' colours and materials—				
White lead, basic carbonate .. cwt.	7,097	7,357	8,297	8,548
Lithopone .. ,,	23,052	13,717	15,078	9,230
Ochres and earth colours cwt.	25,319	49,458	10,083	19,135
Bronze powders ,,	1,381	1,326	9,548	9,367
Carbon blacks .. ,,	11,282	18,552	18,012	29,496
Other pigments and extenders, dry .. cwt.	20,393	25,562	8,163	6,596
All other descriptions,,	12,936	14,079	28,075	25,549
Total .. .. value	—	—	866,802	936,577

Exports

Acids—				
Citric .. .. cwt.	3,968	1,678	10,772	7,070
All other sorts .. value	—	—	22,308	23,646
Aluminium compounds tons	1,790	952	20,438	5,632
Ammonium compounds—				
Sulphate .. tons	20,389	15,250	122,025	91,518
All other sorts .. ,,	1,028	1,094	13,999	13,128
Bleaching powder (chloride of lime) .. .. cwt.	53,003	44,947	14,413	12,205
Coal tar products—				
Tar oil, creosote oil gal.	5,558,397	4,891,008	86,573	110,680
All other sorts .. value	—	—	10,966	13,790
Copper, sulphate of tons	4,906	4,271	68,434	57,584
Disinfectants, insecticides, etc. .. .. cwt.	30,525	28,022	66,503	62,190
Glycerine .. .. ,,	10,976	13,268	23,596	31,785
Lead compounds .. ,,	12,279	15,135	14,727	16,761
Magnesium compounds tons	420	493	10,179	11,213
Potassium compounds cwt.	6,985	6,120	16,970	11,155
Salt (sodium chloride) tons	18,811	22,336	54,053	59,378
Sodium compounds—				
Carbonate, including soda crystals, soda ash and bicarbonate cwt.	354,922	345,972	87,204	82,137
Caustic .. .. ,,	143,980	200,834	91,018	105,900
All other sorts .. ,,	49,138	71,439	63,011	73,195
Zinc oxide .. tons	810	1,218	16,138	21,358
All other descriptions value	—	—	189,955	204,655
Drugs, medicines, etc.—				
Quinine and quinine salts .. .. oz.	44,871	101,952	4,880	11,209
Proprietary medicines value	—	—	85,940	81,074
All other descriptions ,,	—	—	127,410	120,340
Finished dyestuffs (coal tar)—				
Alizarine, alizarine red and indigo (synthetic) cwt.	1,782	2,335	13,021	13,536
Other sorts .. ,,	5,348	6,612	70,963	86,004
All other descriptions ,,	20,889	18,314	29,179	27,564
Painters' colours and materials—				
Ochres and earth colours cwt.	21,195	21,251	16,849	17,944
Other descriptions ,,	13,933	18,062	18,981	30,336
Paints and painters' enamels, prepared cwt.	36,458	35,972	94,139	92,784
Varnish and lacquer gal.	75,444	85,527	30,368	32,757
All other descriptions cwt.	21,695	33,689	48,973	67,556
Total .. .. value	—	—	1,577,645	1,635,191

Re-Exports

Chemical manufactures and products .. value	—	—	313,734	19,129
Drugs, medicines and medicinal preparations—				
Manufactured or prepared .. .. value	—	—	21,577	7,011
Raw or simply prepared value	—	—	15,662	18,391
Dyes and dyestuffs and extracts for dyeing and tanning .. .. cwt.	563	530	2,090	896
Painters' colours and materials .. .. cwt.	295	607	507	1,291
Total .. .. value	—	—	353,570	46,718

The British Commercial Gas Association

A Pioneer in Co-operative Publicity

THE British Commercial Gas Association was founded in 1911, the King's Coronation year. The whole of its work and progress, therefore, may aptly be considered in relation to the twenty-five years of His Majesty's reign. One of the main objects of the Association was, and still is, to promote the commercial prosperity of the gas industry. The Association's ideal, briefly stated, is to have every member of the public informed of every way in which gas can be of assistance to him, to have every member of the public taking full advantage of his gas supply.

The appointment by a national industry of a central organisation to carry out an ideal of this kind was, twenty-four years ago, an entirely revolutionary idea in the sphere of industry and commerce. No other industry in the world had done anything of the kind on the same scale. To-day, the gas industry's example has been followed by many important industries in this country and elsewhere.

The Association's Activities

The Association is supported by a system of voluntary levies based upon the output of gas in each district. Close upon one hundred per cent. of the gas undertakings in the British Isles are subscribers to the national service organisation and have representation upon its committees.

The field of work covered by its activities is broad and catholic. To achieve its main object of making the uses of gas as widely known as possible, extensive publicity is, of course, a primary necessity and a large proportion of the Association's work consists in the preparation of this material and in putting it before the public. Through the Press, by lectures, by the distribution of books and leaflets, by the arrangement of exhibitions and displays, by the holding of conferences both national and district, by the publication of periodical journals dealing with the various uses of gas, by campaigns among doctors, architects and other professions—in these and other ways the Association strives to keep the services of the gas industry constantly before the notice of the public.

In this connection, it is worth noting, as evidence of the honest endeavour to render real service to the public, that a leaflet published by the Association during the war on the thrifty use of fuels was adopted by the Government and issued as an official publication. This is an excellent example of how a body formed before the war to increase trade immediately used its organisation to conserve national wealth for winning the war.

Comprehensive Education Scheme

Another important branch of the Association's activities is in connection with a comprehensive scheme of education within the industry, the B.C.G.A. overseeing the sales and service side, while the Institution of Gas Engineers deals with schemes of technical education. More recently the Association has devoted increased attention to the question of home service and home planning—a national competition on kitchen planning inaugurated by the Association last year producing some 23,000 entries; while on the industrial side it has actively interested itself in the scheme of "industrial development centres" instituted by the gas industry a year or two ago. These centres, set up in important industrial districts, exist for the dual purpose of giving industrialists the latest information and practical advice on heating problems and of acting as a "research pool" within the gas industry itself, so that the results of technical experiments are available all over the country.

The importance of the work of the gas industry has received well-merited recognition. The interest of the Royal Family in this great British industry is shown by the opening by His Majesty of the Gas Light and Coke Co.'s coal handling plant at Beckton in 1926, and by the subsequent visit of the Prince of Wales; while the Association's annual conferences have twice been honoured by the presence of Royalty in the persons of the Duke of York and the Duke of Kent.

Many notable public figures have associated themselves with the work of the Association and its distinguished list of past-presidents includes the names of that eminent scientist, the late Lord Moulton, and Sir Robert Hadfield.

Side by side with the progress of the B.C.G.A. has gone an enormous expansion of the industry which gave it birth. Advances in the technique of gas production, in the facilities for gas storage and in the efficiency and scope of gas-consuming apparatus of all kinds have marked the last twenty-five years.

In no sphere of its activities has the gas industry enjoyed a greater expansion than in the industrial field. During the depression—from 1929 to 1932—the Gas Light and Coke Co. increased its industrial gas load by 7 per cent. The last figure available is 3,596 million cu. ft. in 1933, which represents 7½ per cent. of the total sales of gas. The industrial gas load in Sheffield has been increasing in an extraordinary manner during the last few years and particularly since the South Yorkshire Gas Grid was begun. The industrial load in 1933 was 2,910 million cu. ft. or 56 per cent. of the total gas sold. In Birmingham about 4,000 million cu. ft. of gas a year are sold for industrial purposes or about 30 per cent. of the total sales.

Among new uses for gas introduced since the war are its application as a method of floodlighting and its use in a highly compressed form as a substitute for imported motor fuel. In this connection, too, the growing list of gas undertakings which are now producing benzol on a large scale may be mentioned.

Italian Chemical Industry

Montecatini Progress in 1934

THE Montecatini chemical combine, which declared a dividend of 8 per cent. for 1934, gives a detailed account of its multifarious activities in its annual report. During the period under review the Italian output of lead ore was about 30,000 tons (same as previous year), but imports rose from 18,000 tons to 37,000 tons, while exports remained almost unchanged at 2,300 tons. Metallic lead production underwent a great expansion from 25,000 tons to 42,000 tons, imports falling from 8,500 tons to 6,000 tons.

A subsidiary concern, Montevecchio Anonima Mineraria (in which the Monteponi Company also holds an interest), slightly increased its galena output to 16,000 tons and that of blende to 4,800 tons. This subsidiary is now in process of reorganisation with a view to further expansion of output. The recently formed subsidiary, Societa Italiana dello Zinco, is constructing an electrolytic zinc plant at Marghesa, for which the raw material will be zinc blende. It is proposed to de-sulphur the latter on the spot with a view to making sulphuric acid. Of the 800,000 tons pyrites (732,000 previously) produced in all Italy in 1934, the Montecatini Company accounted for no less than 89.7 per cent. A similar monopolistic position prevailed in the sulphur industry (excluding Sicily) where independent firms produced only 8,500 tons out of a total of 100,000 tons. The Montecatini combine does not hold an important place in the Sicilian sulphur industry, its subsidiary (Societa Solfifera Siciliana) accounting for 22,000 tons out of a total for the year of 250,000 tons.

Of the total Italian copper sulphate output of 1,250,000 cwt., about 860,000 cwt. were marketed by the sales organisation, S. A. Agenzia Vendita Solfato di Rame, controlled jointly by the Montecatini, Marengo and Cita concerns. Independent producers accounted for 323,000 cwt. The various nitrogen products plants of the combine's subsidiary, Soc. An. Ammonia e Derivati, are reported to have operated satisfactorily during the year under review. Home sales of nitrogenous fertilisers rose from 4 millions cwt. to 4,700,000 cwt., of which 1,400,000 cwt. were represented by calcium cyanamide. Good results are reported for the rayon subsidiary, Societa Rhodiaceta Italiana, as also for the dyestuffs subsidiary, A.C.N.A.

The British Glass Convention

Sir Harry McGowan Deprecates Government Control

SIR HARRY MCGOWAN, chairman of Imperial Chemical Industries, Ltd., speaking at the fourth British Glass Convention at Folkestone on May 16, said that under the conditions that have been ruling during the past few years there had been considerable expansion of Government intervention in economic life here as well as everywhere else. At the same time, he continued, he strongly deprecated Government control, and he suggested that our position at home and abroad could be vastly improved without such control if our industries embraced their opportunities to collaborate with each other.

Industry in this country was becoming decidedly more "research-minded." On that we founded our present and future success. Expenditure on research, in addition to other functions, raised the standard of the life of our people. We in this country had undergone a trying experience for some years past, but thanks to a stable Government, backed up by an unswerving loyal people, we were winning through. What other great Power was in our favoured position to-day? None; and we excited the admiration of the world for the recovery we had made. He was no politician, but he realised to the full what the National Government had done, and to go back at the present time to party politics would simply arrest the progress we saw before us.

Shorter Hours Experiment

Mr. G. L. PILKINGTON, of St. Helens, in his presidential address, referred to the mechanisation of the industry and its effect on employment and the quality and design of the products. The employment of their men had given manufacturers many anxious moments, particularly in the last few years. Mechanical processes were bound to increase unemployment unless sufficient machines were installed to absorb all those who were previously engaged in the hand-operated processes, and that was obviously an impossibility unless consumption increased. Accordingly, he suggested a palliative, and that was the shortening of working hours. His firm introduced a proposal to the St. Helens Plate and Sheet Glass Industrial Council, which after consideration announced its approval of the scheme, which was put into operation in August, 1933, for a trial period of six months, the hours of work being, day workers 42½ hours, and shift workers 42 hours a week. In principle, except certain piece and bonus workers, a man received the same weekly rate for the shorter hours as he received for the longer hours, 46 to 48. The employers obtained certain concessions for week-end overtime in the process and paid no extra time to the day workers.

The comparative results for the six months before and six months after the inception of the scheme were: The reduction in hours per person was 10 per cent., the increase in output was 15 per cent., the increase in the number of employees was only 8.4 per cent., and the output value per man went up by 11.4 per cent. The average weekly earnings were unchanged. The scheme had been adopted as a permanency, and if it was possible to apply the system to one part of the glass industry he suggested it was worthy of consideration by others.

The Future of Glass

Major F. A. FREETH, chief research chemist of Imperial Chemical Industries, Ltd., addressing the convention on May 17, said that glass was one of the two great inventions of all time, fire being the other. Life without glass was unthinkable. He had seen a glass which cast no shadow. They could see through it, and it kept out heat. That meant to say that if they got an architect of sufficient imagination they would be able to build a house of glass and be able to see through it without being seen. They would be able to keep the heat out and thus to keep cool. He urged the necessity of research work in the glass industry. The glass people were lucky because all young women liked glass. The industry had had a certain measure of protection from the Government during the last few years, and very properly so. To his mind, protection was all wrong in theory, but absolutely right in practice. Glass was obviously going to come into its own more and more. If they travelled to Holland they would see a factory of all glass. That kind of building was coming into England.

The John Benn Hostel

Progress all Along the Line

THE report of the John Benn Hostel which was submitted to the seventh annual meeting of the East-End Hostels Association on May 16 was a record of progress all along the line. The Hostel was started in memory of the late Sir John Benn, the founder of Benn Brothers, Ltd., publishers of THE CHEMICAL AGE, to provide a home for eighty boys between fourteen and eighteen years of age, who would otherwise be homeless. The report stated that unemployment among the boys was practically non-existent, and that the vast majority had excellent prospects. During the year the chairman of the Council, Mr. H. Eric Miller, had raised a special fund for the repointing and painting of the outside of the Hostel and the provision of a new sanitary block for the dormitories. The financial position of the Hostel, to which the boys contributed a specified portion of their earnings, was a little happier than in earlier days, though the council had still to rely on a great number of friends to make ends meet.

The annual appeal this year is being made by Sir Ernest Benn, president of the Association, who will preside at the annual banquet at Stationers' Hall, London, on June 20.

Pharmaceutical Society

New Headquarters to Cost £195,000

PRESIDING at the ninety-fourth annual meeting of the Pharmaceutical Society, at 17 Bloomsbury Square, on May 15, Mr. John Keall referred to the project for the erection of new headquarters for the Society. The leases for the existing premises at Bloomsbury Square, he said, were coming to an end, and, as trustees for the future, the council had decided that their headquarters ought to stand on a site which was their own property. In 1929 they bought a freehold site in Brunswick Square and since then they had been planning the new building. Their intentions were that it should be a building worthy of the Society, and architecturally an asset to London. He hoped the building would be somewhat larger than their immediate requirements, both to provide for future expansion and to bring in some revenue until such time as that additional accommodation was needed.

Such preliminary estimates as the council had been able to obtain indicated a cost of £195,000, which was £65,000 less than the figure so gaily talked about by some irresponsible people. In considering the cost, they had to bear in mind that they were building for the future. They were not a small and insignificant organisation, but a large and important calling, entrusted by the State with important duties and with the responsibilities which went with such duties. The present position could be summarised by saying they had purchased a freehold site, ascertained that the maximum accommodation which they might require could be accommodated on that site and was not beyond the financial capacity of the Society to provide for, and taken steps which had practically resulted in the selection of an architect.

Referring to the Poisons Board, the president said the board had during the year produced for the comments of the interests affected, a draft of its proposed recommendations to the Home Secretary. It was understood that substantial alterations might be made as the result of representations which had been received, but the contents of the final draft were not yet known. The members of the Society had probably studied with some care the first draft, and, whatever their views may be as to the complication of its legal form and as to improvements which might be made in a number of directions, they must agree that they had been well served by their pharmaceutical representatives on the Poisons Board. They had undertaken with their colleagues a very difficult, a very detailed and a very thankless task in attempting to codify the complicated provisions of poisons legislation of this country. They were glad to feel that pharmacists had been able to take an active part in this work, although, naturally, they must await the final regulations before they could express a considered judgment.

There was a ballot for seven members of the council, resulting in the election of Messrs. A. R. Melhuish, J. C. Young, E. H. Simmons, H. M. Lloyd, L. M. Parry, P. F. Rowsell and F. G. Wells.

Personal Notes

SIR HAROLD G. DOWNER, a director of Turner and Newall, Ltd., has died at the age of 69.

SIR ALFRED PALMER, former chairman of the Bede Metal and Chemical Co., Hebburn-on-Tyne, and a director of the Marley Hill Chemical Co., Co. Durham, who, with Lady Palmer, at present resides at Walworth Castle, Darlington, is moving to Wimbledon.

MR. ARNOLD JAMES MERCER, Atherton, joint managing director of Stotherts, Ltd., manufacturing chemists, of Atherton, and a director of Mercer and Sons, heating engineers, of Blackburn, is one of the 55 new magistrates appointed by the Duchy of Lancaster.

THE COMMITTEE OF AWARD of the Commonwealth Fund Fellowships has made the following appointments to Fellowships tenable by British graduates in American universities for the two years beginning September, 1935. MR. F. X. AYLWARD, B.Sc., University of Liverpool, to Johns Hopkins University, in Biochemistry. MR. LESLIE YOUNG, B.Sc., Imperial College of Science and Technology, and University of London, to Washington University, in Biochemistry. MR. R. B. WILLIAMS, Oxford, to Princeton University, in Chemistry.

LORD ELDON has been appointed chairman of Coal and Allied Industries, Ltd., in place of Mr. F. C. Marten, who has been elected deputy chairman.

COLONEL WILLIAM NORMAN PILKINGTON, who died on February 8, director of Pilkington Brothers, Ltd., glass manufacturers, left gross estate of the value of £384,040 (net personalty £372,888).

MR. THOMAS FISHER UNWIN, of Midhurst, Sussex, an ex-director of Ernest Benn, Ltd., who died on February 6, has left estate of the gross value of £10,801 (net personalty £8,649).

MR. FINDLAY MUIRHEAD, the founder of the Blue Guides now published by Ernest Benn, Ltd., died on May 16. He was the father of Mr. Russell Muirhead, the present Editor of "Discovery."

PROFESSOR H. E. ARMSTRONG, Professor and Mrs. C. H. Desch, Lord Melchett, Sir Robert and Lady Robertson, Mr. Edwin Thompson and Professor W. W. Watts were among the guests at a conversazione at the Royal Institution on May 17. Sir William Bragg, Fullerian Professor of Chemistry gave a short lecture on "Aeolian Tones," and experiments were also shown in the laboratories.

Continental Chemical Notes

Switzerland

INCREASED SALES in 1934 were offset by lower prices, according to the report of Durand and Huguenin S.A., of Basle. The net profit of 386,000 francs compares with 622,000 francs previously, and a 10 per cent. dividend is distributed on the two million francs share capital (12 per cent. previous).

Spain

EXTRACTION OF IODINE and other products from marine algæ is contemplated by the Explotacion de Algas S.A., recently formed with a capital of 500 pesetas ("Chemische Industrie").

Greece

TURPENTINE OIL AND ROSIN EXPORTS during 1934 amounted respectively to 46,000 hectolitres (valued at 52 million drachmas) and 15,000 tons (valued at 71 million drachmas). In both cases Italy was by far the best customer.

Germany

A NEW ASBESTOS DEPOSIT, yielding a good quality material and favourably situated for exploitation is reported ("Chem.-Zeitung," May 8) to have been discovered near Rimbach in Bavaria.

A VERY LARGE INCREASE IN NET PROFITS (from 345,000 RM to 630,000 RM) is announced by Th. Goldschmidt A.-G., of Essen, in the report for 1934 and a resumption of dividend payments after four years' interval is proposed in the shape of a 5 per cent. distribution.

Poland

THREE LEADING MANUFACTURERS have formed a cartel for the production of salicylic acid and its sale on the domestic and foreign markets.

ALKALOID PRODUCTS will be manufactured by the newly-registered Motor Alkaloida, Zaklady Chemiczne Company of Warsaw (capital 250,000 zloty).

EXPANSION OF CASEIN PRODUCTION is planned with a view, in the first place, to meeting the demand from the home plywood industry (estimated annual consumption 600 tons).

SODIUM HYPOCHLORITE MANUFACTURE has been commenced by the state nitrogen factories at Chorzov and Moscice. Other new industrial developments are the production of anthraquinone by the Zaklady Chemiczne of Winnica and erection of a plant for guaiacol and its derivatives by Ludwig Spiess i Syn in Warsaw.

Russia

TELLURIUM IS BEING ISOLATED as a by-product at the Kyschtym copper smelting works.

Estonia

THE ESTABLISHMENT OF OIL-SHALE DISTILLING WORKS is being considered in official quarters.

France

THE MANUFACTURE OF PRODUCTS FROM WOOD CHARCOAL is to be carried on by a new company under the style of Comptoir Français de Bois épuré.

SYNTHETIC PHENOL PRODUCTION is now in full swing at the Oissel factory of Etablissements Kuhlmann. Increased output of chlorine products and caustic alkalis by the electrolytic process was achieved last year at the Loos factory. Manufacture of phosphoric acid and phosphate fertilisers has also been taken up at the Wattrelos factory.

SEVEN CYANAMIDE FACTORIES are at present operating in France with a total output capacity of nearly 200,000 tons, although the actual output in 1933-34 (12 months) was only 50,000 tons. A common marketing organisation distributes the products of six concerns, the outsider being the Cie. de St. Gobain ("Chemische Industrie").

Fatality at Huddersfield

Processing Plant in Flames

TWO men received fatal burns and three others were slightly injured at the Dalton, Huddersfield, works of the British Dyestuffs Corporation on Monday, when a glycol processing plant burst into flames. The two victims were Thomas Tighe (23), who died almost immediately; and George William Hewison Bolam (30), who died in Huddersfield Royal Infirmary about an hour after the accident. The other three men had only their hair and eyebrows singed and were treated at the works first-aid depot.

A quantity of inflammable oil became ignited, resulting in the collapse of the containing vessel. The fire itself was extinguished by the firm's own fire brigade, and the flames were confined to the one particular plant. The vessel which burst contained an inflammable vapour which would burn with great violence.

Goodlass Wall and Lead Industries

New Developments in Plant

GOODLASS Wall and Lead Industries, Ltd., held their fourth annual general meeting on May 15 at Winchester House, Old Broad Street, London. Mr. Clive Cookson, chairman, said that new and up-to-date plant for the manufacture of grey oxide of lead had been installed at one of the company's works, and a new press for the manufacture of lead pipe erected in the place of older plant. Land had been acquired at Speke, near Liverpool, for the erection of a new plant for the manufacture of varnish and of an up-to-date installation for the making of the latest types of finishes.

Regarding the lead powders used in electrical storage batteries, the board had arranged to work the original Japanese patents, and had installed a very modern plant, securing the production of a material reported to be an advance on any hitherto available. Considerable attention had been given to the development of the company's tellurium lead patents, and licensing arrangements had been made for the United States and several of the important Continental countries. Research on the chemical, engineering and metallurgical problems of the company's business was continually going on, not only in their own works and laboratories, but also in collaboration with customers and with the trade research associations.

As to their overseas activities, the company's plant in Germany had worked last year in a satisfactory manner, and if the difficulties in the supply of raw material could be overcome, a continuation of satisfactory trading was anticipated. In Australia, results had reflected the general improvement in conditions, and from Ireland steady and sound expansion was reported. With regard to supply of metallic lead, conditions had proved somewhat difficult, but they would support any measures for the maintenance and furtherance of the interests of the lead-producing Dominions.

The trading profit for 1934 at £238,829 showed an increase of about 10 per cent. A dividend of 6 per cent. would be paid on the ordinary share capital, compared with 5 per cent. last year and 3 per cent. the year before, carrying forward £21,235 more at £97,629.

Varnish not up to Standard

Secret Improvement on old Recipe Book

AN allegation that some varnish supplied was not fit for the purpose for which it was supplied, was made at Shoreditch County Court on May 17, before Judge Konstam. Joseph Wexler, walking stick manufacturer, of Islington, sued F. and E. Tomkins, Ltd., french polish and varnish manufacturers, of Shoreditch, to recover £32 19s. 6d. The plaintiff's claim was that in November he had a sample and, after a test, he continued to purchase varnish from the defendants under an implied warranty, and relied upon their skill and judgment that it was reasonably fit for varnishing sticks of best quality. As a fact, he had a quantity of sticks returned and it cost him £16 7s. 9d. to repolish; £1 11s. 9d. carriage; £1 10s. for the material for repolishing; and £13 10s. loss of profit over 1½ weeks during which time he was doing this repolishing work instead of carrying out orders. There was a counter-claim for £18 10s. for varnish supplied, which was admitted subject to plaintiff's claim.

Mr. E. Montagu appeared for the plaintiff, and Mr. Graham Brooks for the defendants.

Mr. Wexler, in evidence, said he had been a stick manufacturer for 27 years, and since 1923 he had been polishing sticks for one of the largest firms of walking stick and umbrella manufacturers. He had no complaint from them until he bought this varnish from the defendants. He had dealt with the defendants a number of years and then found their varnish unsuitable, and from 1932 to 1934 did not order any. Then Mr. Tomkins came along and said he had a super stick varnish which dried very quickly and was the best varnish on the market. He bought a half-gallon sample to test it and found that it was all that it was said to be. He continued to order and bought in all 13½ gallons. Subsequently he had a large number of sticks returned and had to have them repolished.

Dr. Henry E. Cox, public analyst for Hampstead, said he had analysed a sample of the varnish and found that the amount of water in relation to the amount of alcohol was rather high. That would come from the use of a wet shellac. It would be deteriorated by the water, imperfectly dissolved, and the rate of drying would be affected. There would be a proneness to chip off.

Fredk. Henry Tomkins, managing director of the defendants, said he had been 35 years in business. He sent round to the plaintiff for an order and plaintiff asked for a sample, which was sent. He had renovated the varnish about that time, but did not tell the plaintiff so.

Asked by Judge Konstam what he meant by this, witness said he got an old recipe book and an old chemical book and based it on that, but improved the formula—it was all a secret. He was positive there was nothing wrong with the varnish supplied.

Fredk. Wm. Tomkins, son of the managing director, said he made up 75 to 80 gal. of the mix, and the whole varnish supplied to the plaintiff came from that. They received no complaints from other customers who were stick manufacturers.

Judge Konstam said that on the evidence of the analyst he could only imagine that this particular brew was affected by some means, and therefore was not up to standard. Plaintiff had clearly bought by sample and imagined he was going to get the same quality all through the piece. He could not find for the loss of profit, and would give judgment for the plaintiff for £19 9s. 6d., with costs, and for the defendants on the counter-claim for £18 10s.

News from the Allied Industries

Iron and Steel

FURTHER MEETINGS took place in London on May 21 between the British Iron and Steel Federation and representatives of the Continental steel cartel. The negotiations had reference to a number of distinct steel products in respect of which agreement has to be reached concerning the export quotas which are to be permitted to Great Britain under the projected long-term agreement.

Beet Sugar

CASH BONUSES to the value of £300,000 (£30,000 from capital reserve and £270,000 from general reserve) were declared at an extraordinary general meeting of the Ely Beet Sugar Factory, Ltd., on May 17. The English Beet Sugar Corporation, Ltd., the same day declared cash bonuses of £300,000 from general reserve, and the Ipswich Beet Sugar Factory, Ltd,. declared cash bonuses of £140,000 (£4,000 from capital reserve and £136,000 from general reserve).

Oil Refining

MEETINGS of Berry Wiggins and Co., oil refiners, manufacturers of bituminous materials, etc., are to be held on June 3 to consider proposals for the increase of the capital to £430,000 by the creation of 215,000 five and a half per cent. cumulative preference £1 shares, for the conversion of the existing 165,000 ten per cent. cumulative participating preference £1 shares into 660,000 "A" ordinary 5s. shares, and the conversion of the existing ordinary 4s. shares into "B" ordinary shares. Profits would be distributable as follows: First, in payment of a cumulative dividend of 5½ per cent. on the preference shares; secondly, in payment of a cumulative dividend of 10 per cent. on the "A" ordinary shares; thirdly, in payment of a non-cumulative dividend of 10 per cent. on the "B" ordinary shares; and, fourthly, in payment of one-fifth of the residue by way of a further dividend on the "A" ordinary shares, and as to the remaining four-fifths of the residue in payment of a further dividend on the "B" ordinary shares.

Russian Bichromate Plant

BICHROMATE produced at a new factory in Eriwan, Armenia, is partly intended for utilisation in the synthetic rubber plant to be built eventually at the same place. The first unit of the bichromate factory, with a daily production capacity of 800 kilograms, is now in process of erection. A second unit, with a similar capacity, will be commenced before the end of the year.

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.

Complete Specifications Open to Public Inspection

2-PHENYL-4-CARBOXYLIC ACIDS, manufacture of derivatives.—Dr. H. John. Nov. 10, 1933. 3919/34.

RUBBER, vulcanisation.—Goodyear Tire and Rubber Co. Nov. 10, 1933. 22641/34.

CARBONACEOUS MATERIALS, destructive hydrogenation.—International Hydrogenation Patents Co. Nov. 11, 1933. 28134/34.

CHLORINATION PRODUCTS of caoutchouc, producing.—Thurn and Beschke Kommandit-Ges. Nov. 9, 1933. 29170/34.

OXIDATION PRODUCTS from hydrocarbons, manufacture.—Standard Oil Development Co. Nov. 10, 1933. 29227/34.

SYNTHETIC RESINS of the urea formaldehyle type.—Bakelite, Ltd. Nov. 7, 1933. 31546/34.

VISCOSE ARTIFICIAL SILK, desulphurisation and after-treatment. I. G. Farbenindustrie. Nov. 9, 1933. (Cognate application, 31738/34.) 31737/34.

SYMMETRICAL DI-(ARYLAMINO)-HYDROXYBENZENES, manufacture. I. G. Farbenindustrie. Nov. 7, 1933. 32002/34.

TITANIUM PIGMENTS, production.—British Titan Products Co. Nov. 9, 1933. 32060/34.

MONOMERIC ALDEHYDE SUGARS, polymerising.—Holzhydrolyse A.-G. Nov. 7, 1933. 32064/34.

TRIPHENYLMETANE DYESTUFFS, manufacture.—I. G. Farbenindustrie. Nov. 11, 1933. 32350/34.

GLYOXAL SULPHATE, manufacture.—E. I. du Pont de Nemours and Co. Nov. 10, 1933. 32589/34.

CELLULOSE ACETATE ARTIFICIAL SILK, dyeing.—Soc. of Chemical Industry in Basle. Oct. 15, 1932. (Divided out of 28090/33.) 13569/35.

Specifications Accepted with Date of Application

FLUORINE DERIVATIVES of hydrocarbons, methods of preparing. Kinetic Chemicals, Inc. Aug. 31, 1932. (Addition to 391,168.) 428,361.

ALUMINIUM-BASE ALLOYS.—A. H. Stevens (Aluminium, Ltd.). Sept. 7, 1933. (Convention date not granted.) 428,363.

VAT DYEBATHS, preparation.—I. G. Farbenindustrie. Sept. 28, 1932. 428,047.

WEAK ACIDS from gases, separation.—J. Y. Johnson (I. G. Farbenindustrie). Oct. 30, 1933. 428,059.

CONDENSATION PRODUCTS of acetylene, production.—W. Mitchell and Imperial Chemical Industries, Ltd. Nov. 7, 1933. 428,080.

DYESTUFFS, manufacture.—C. S. Bedford. Nov. 8, 1933. 428,143.

RUBBER, preservation.—E. I. du Pont de Nemours and Co., and A. M. Neal. Nov. 8, 1933. 428,146.

BISMUTH COMPOUNDS, manufacture of organic.—I. G. Farbenindustrie Nov. 8, 1932. 428,147.

ESTERS of unsaturated monocarboxylic aliphatic acids, production.—E. I. du Pont de Nemours and Co., and D. J. Loder. Nov. 9, 1933. 428,223.

CHROMIC ACID and sparingly-soluble chromates, preparation.—R. E. Pearson and W. V. Gilbert. Nov. 9, 1933. (Cognate application, 12075/34.) 428,375.

COPPER from copper-sulphide ores, production.—F. L. Duffield. Nov. 11, 1933. 428,378.

DYESTUFF PREPARATIONS.—J. Y. Johnson (I. G. Farbenindustrie). Nov. 13, 1933. 428,390.

SILVER HALIDE EMULSIONS, process for making photographic.—Soc. of Chemical Industry in Basle. Dec. 10, 1932. 428,305.

SULPHURIC ACID DERIVATIVES of organic acid amides, manufacture.—Henkel and Cie. Ges. May 12, 1933. (Samples furnished.) 428,153.

PETROLEUM and like hydrocarbons.—Standard Oil Development Co. June 6, 1933. 428,410.

DYESTUFFS, production.—J. D. Kendall. Oct. 3, 1933. (Divided out of 27206/33.) 428,359.

Applications for Patents

(May 2 to 8 inclusive.)

DERIVATIVES OF HYDROCYANIC ACID, manufacture.—Imperial Chemical Industries, Ltd. (United States, May 3, '34.) 13305.

RUBBER DERIVATIVES, manufacture of products.—Imperial Chemical Industries, Ltd. 13488.

COLOURING PLASTIC MASSES.—J. Y. Johnson (I. G. Farbenindustrie). 13104.

UNSATURATED NITRILES, manufacture.—J. Y. Johnson (I. G. Farbenindustrie). 13105.

AZO DYESTUFFS, manufacture.—J. Y. Johnson (I. G. Farbenindustrie). 13106.

N-SUBSTITUTION PRODUCTS of 1.4-diaminoanthraquinone, manufacture.—J. Y. Johnson (I. G. Farbenindustrie). 13195.

AZO COMPOUNDS, manufacture.—J. Y. Johnson (I. G. Farbenindustrie). 13196.

CHLORALKYLAMINES, ETC., manufacture.—J. Y. Johnson (I. G. Farbenindustrie). 13197.

HYDROCARBONS, manufacture.—J. Y. Johnson (I. G. Farbenindustrie). 13430.

AROMATIC DICARBOXYLIC AMIDES, manufacture.—J. Y. Johnson (I. G. Farbenindustrie). 13431.

VAT DYESTUFFS, manufacture.—J. Y. Johnson (I. G. Farbenindustrie). 13432.

HYDROGENATED FATTY ACIDS, production.—Metallges A.-G. (Germany, May 16, '34.) 13575.

SULPHATE CHLORIDE, manufacture of ferric.—Röhm and Haas A.-G. (Germany, May 31, '34.) 13592.

LIME ALUMINATES, purification.—J. C. Séailles. (Belgium, May 12, '34.) 13272, 13273, 13274.

CHEMICAL TREATMENT of liquid products.—Sharpes Speciality Co. (United States, May 16, '34). 13553, 13554, 13555.

BROMINATION PRODUCTS of vat dyestuffs, manufacture.—Soc. of Chemical Industry in Basle. (Switzerland, May 19, '34.) 13118, 13119.

DYEING CELLULOSE ACETATE ARTIFICIAL SILK.—Soc. of Chemical Industry in Basle. (Oct. 11, '33.) (Switzerland, Oct. 15, '32.) 13569.

PLASTIC COMPOSITIONS, coating compositions, and the like.—J. W. C. Crawford and Imperial Chemical Industries, Ltd. Sept. 27, 1933. 427,727.

NITROGENOUS CONDENSATION PRODUCTS, manufacture and production.—J. Y. Johnson (I. G. Farbenindustrie). Oct. 19, 1933. 427,733.

METHYL CHLORIDES, manufacture and production.—J. Y. Johnson (I. G. Farbenindustrie). Oct. 21, 1933. 427,738.

HYDROCARBON GASES, manufacture.—H. Dreyfus. Oct. 26, 1933. (Cognate application, 20576/34.) 427,798.

HYDROGEN, manufacture.—G. F. Jaubert. Oct. 29, 1932. (Cognate application, 30140/33.) 427,967.

WATER-SOLUBLE DIAZOIMINO COMPOUNDS, process for the manufacture.—I. G. Farbenindustrie. Feb. 15, 1933. (Addition to 320,324 and 407,840.) 427,803.

STABILISED CHLORINATED RUBBER, process for the manufacture.—A. Carpmael (I. G. Farbenindustrie). Oct. 31, 1933. 427,804.

METHACRYLIC ACID, production of esters.—J. W. C. Crawford and Imperial Chemical Industries, Ltd. Oct. 31, 1933. (Additions to 22673/32 and 7354/33.) 427,810.

HYDROXYDIPHENYLENE COMPOUNDS, process for the manufacture. I. G. Farbenindustrie. Nov. 1, 1932. 427,816.

AZO DYESTUFFS, process for the manufacture.—I. G. Farbenindustrie. Nov. 5, 1932. 427,973.

ORGANIC MERCURY COMPOUNDS, manufacture.—I. G. Farbenindustrie. Nov. 5, 1932. 427,974.

DYESTUFFS of the oxazine series, manufacture.—I. G. Farbenindustrie. Nov. 3, 1932. 427,977.

ORGANIC MERCURY COMPOUNDS, manufacture.—H. E. Parker and Imperial Chemical Industries, Ltd. Nov. 3, 1933. 427,979.

ORGANIC SULPHUR COMPOUNDS, manufacture and production.—J. Y. Johnson (I. G. Farbenindustrie). Nov. 25, 1933. 427,903.

CHROMIFEROUS DYESTUFFS, manufacture.—Soc. of Chemical Industry in Basle. April 4, 1933. 427,922.

DIBENZOTHIAZYLDISULPHIDE, preparation.—Silesia Verein Chemischer Fabriken. July 18, 1933. 427,847.

HALOGENAMINE ALKYLSULPHURIC ESTERS or alkylsulphonic acids, manufacture and production.—I. G. Farbenindustrie. Aug. 29, 1933. 427,943.

AZO DYESTUFFS, manufacture of conversion products.—J. R. Geigy A.-G. Sept. 15, 1933. (Addition to 306,447.) 427,771.

(May 9 to 15 inclusive.)

RECOVERY OF SULPHUR DIOXIDE from gas mixtures.—W. E. Batten, Imperial Chemical Industries, Ltd., and A. M. Clark. 14278.

ESTERS OF 2-BUTYLOCTANOL.—Carbide and Carbon Chemicals Corporation. (United States, May 11, '34.) 13885.

VINYL RESINS, production.—Carbide and Carbon Chemicals Corporation. (United States, June 15, '34.) 14079.

POLYMERISATION PRODUCTS, manufacture.—A. Carpmael. 13843.

DIAZOTISING AZO DYESTUFFS, manufacture.—A. Carpmael. 13844.

NITROGENOUS AROMATIC ALDEHYDES, manufacture.—A. Carpmael. 13910.

THIAZOLIUM COMPOUNDS, manufacture.—A. Carpmael. 13911.

PRODUCTS FROM OLEFINES, manufacture.—A. Carpmael. 13912.

4-ALKYL-5-HYDROXY-ALKYL-THIAZOLS, manufacture.—A. Carpmael. 14057.

Weekly Prices of British Chemical Products

Review of Current Market Conditions

WITH the exception of solvent naphtha, 90/160, which has been reduced by 1d. per gal., there has been no change in the prices of chemical products during the past week. Unless otherwise stated the prices below cover fair quantities net and naked at sellers' works.

LONDON.—The inquiry on the London chemical market has been quite satisfactory and markets remain firm with little alteration. In the coal tar products section there has been no change.

MANCHESTER.—Generally steady price conditions have been reported on the Manchester chemical market during the past week, and there has been no giving way in any department. Whilst there continues to be little of the nature of speculative forward buying, users are not hesitating to renew contracts as they expire and here and there moderate new bookings with deliveries extending over the next two or three months have been reported. In addition, there has been a quietly steady business passing for spot and near dates. Fair quantities of most of the leading heavy products are being taken up in Lancashire and West Yorkshire against specifications, and there is little of which to complain in this respect, although room for improvement in the case of the textile chemicals.

SCOTLAND.—The Scottish heavy chemical market showed a slight improvement during the past week.

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.—11¾d. per lb. less 5%. MANCHESTER: 11¾d.

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

ACID, FORMIC.—LONDON: £40 to £45 per ton.

ACID, HYDROCHLORIC.—Spot, 4s. to 6s. carboy d/d according to purity, strength and locality. SCOTLAND: Arsenical quality, 4s.; dearsenicated, 5s. ex works. full wagon loads.

ACID, LACTIC.—LANCASHIRE: Dark tech., 50% by vol., £24 10s. per ton; 50% by weight, £28 10s.; 80% by weight, £48; pale tech., 50% by vol., £28; 50% by weight, £33; 80% by weight, £53; edible, 50% by vol., £41. One-ton lots ex works, barrels free.

ACID, NITRIC.—80° Tw. spot, £18 to £25 per ton makers' works, SCOTLAND: 80°, £24 ex station full truck loads.

ACID, OXALIC.—LONDON: £47 17s. 6d. to £57 10s. per ton, according to packages and position. SCOTLAND: 98/100%, £48 to £50 ex store. MANCHESTER: £49 to £54 ex store.

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

ACID, TARTARIC.—1s. per lb. less 5%, carriage paid for lots of 5 cwt. and upwards. MANCHESTER: 1s. 0¾d. per lb.

ALUM.—SCOTLAND: Lump potash, £8 10s. per ton ex store.

ALUMINA SULPHATE.—LONDON: £7 10s. to £8 per ton. SCOTLAND: £7 to £8 ex store.

AMMONIA, ANHYDROUS.—Spot, 10d. per lb. d/d in cylinders. SCOTLAND: 10d. to 1s. containers extra and returnable.

AMMONIA, LIQUID.—SCOTLAND: 80°, 2½d. to 3d. per lb., d/d

AMMONIUM BICHROMATE.—8d. per lb. d/d U.K.

AMMONIUM CARBONATE. SCOTLAND: Lump, £30 per ton; powdered, £33, in 5-cwt. casks d/d buyers' premises U.K.

AMMONIUM CHLORIDE.—LONDON: Fine white crystals, £18 to £19. (See also Salammoniac.)

AMMONIUM CHLORIDE (MURIATE).—SCOTLAND: British dog tooth crystals, £32 to £35 per ton carriage paid according to quantity. (See also Salammoniac.)

ANTIMONY OXIDE.—SCOTLAND: Spot, £34 per ton, c.i.f. U.K. ports.

ANTIMONY SULPHIDE.—Golden, 6¾d. to 1s. 3d. per lb.; crimson, 1s. 5½d. to 1s. 7½d. per lb., according to quality.

ARSENIC.—LONDON: £16 10s. per ton c.i.f. main U.K. ports for imported material; Cornish nominal, £22 10s. f.o.r mines. SCOTLAND: White powdered, £23 ex wharf. MANCHESTER: White powdered Cornish, £23, ex store.

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

BARIUM CHLORIDE.—£11 per ton. SCOTLAND: £10 10s.

BARYTES.—£6 10s. to £8 per ton.

BISULPHITE OF LIME.—£6 10s. per ton f.o.r. London.

BLEACHING POWDER.—Spot, 35/37%, £7 19s. per ton d/d station in casks, special terms for contract. SCOTLAND: £8 in 5/6 cwt. casks for contracts over 1934/1935.

BORAX, COMMERCIAL.—Granulated, £14 10s. per ton; crystal, £15 10s.; powdered, £16; finely powdered, £17; packed in 1-cwt. bags, carriage paid home to buyer's premises within the United Kingdom in 1-ton lots.

CADMIUM SULPHIDE.—3s. 4d. to 3s. 8d. per lb.

CALCIUM CHLORIDE.—Solid 70/75% spot, £5 5s. per ton d/d station in drums.

CARBON BISULPHIDE.—£30 to £32 per ton, drums extra.

CARBON BLACK.—3¾d. to 4¼d. per lb. LONDON: 4¼d. to 5d.

CARBON TETRACHLORIDE.—SCOTLAND: £41 to £43 per ton, drums extra.

CHROMIUM OXIDE.—10¾d. per lb., according to quantity d/d U.K.; green, 1s. 2d. per lb.

CHROMETAN.—Crystals, 3½d. per lb.; liquor, £19 10s. per ton d/d.

COPPERAS (GREEN).—SCOTLAND: £3 15s. per ton, f.o.r. or ex works.

CREAM OF TARTAR.—£3 19s. per cwt. less 2½%. LONDON: £3 17s. per cwt. SCOTLAND: £4 2s. less 2½%.

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

DIPHENYLGUANIDINE.—2s. 2d. per lb.

FORMALDEHYDE.—LONDON: £25 10s. per ton. SCOTLAND: 40%, £25 to £28 ex store.

IODINE.—Resublimed B.P., 6s. 3d. to 8s. 4d. per lb.

LAMPBLACK.—£45 to £48 per ton.

LEAD ACETATE.—LONDON: White, £34 10s. per ton; brown, £1 per ton less. SCOTLAND: White crystals, £33 to £35; brown, £1 per ton less. MANCHESTER: White, £34 10s.; brown, £32 10s.

LEAD NITRATE.—£27 10s. per ton.

LEAD, RED.—SCOTLAND: £24 to £26 per ton less 2½%; d/d buyer's works.

LEAD, WHITE.—SCOTLAND: £39 per ton, carriage paid. LONDON: £36 10s.

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

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

MAGNESIUM SULPHATE.—Commercial, £5 per ton, ex wharf.

METHYLATED SPIRIT.—61 O.P. industrial, 1s. 5d. to 2s. per gal.; pyridinised industrial, 1s. 7d. to 2s. 2d.; mineralised, 2s. 6d. to 3s. Spirit 64 O.P. is 1d. more in all cases and the range of prices is according to quantities. SCOTLAND: Industrial 64 O.P., 1s. 9d. to 2s. 4d.

NICKEL AMMONIUM SULPHATE.—£49 per ton d/d.

NICKEL SULPHATE.—£49 per ton d/d.

PHENOL.—7¾d. to 8½d. per lb. for delivery up to December 31.

POTASH, CAUSTIC.—LONDON: £42 per ton. MANCHESTER: £38 to £40.

POTASSIUM BICHROMATE.—Crystals and Granular, 5d. per lb. less 5% d/d U.K. Discount according to quantity. Ground, 5½d. LONDON: 5d. per lb. less 5%, with discounts for contracts. SCOTLAND: 5d. d/d U.K. or c.i.f. Irish Ports. MANCHESTER: 5d.

POTASSIUM CHLORATE.—LONDON: £37 to £40 per ton. SCOTLAND: 99¾/100%, powder, £37. MANCHESTER: £38.

POTASSIUM CHROMATE.—6½d. per lb. d/d U.K.

POTASSIUM IODIDE.—B.P., 5s. 2d. per lb.

POTASSIUM NITRATE.—SCOTLAND: Refined granulated, £29 per ton c.i.f. U.K. ports. Spot, £30 per ton ex store.

POTASSIUM PERMANGANATE.—LONDON: 10½d. per lb. SCOTLAND: B.P. crystals, 9d. MANCHESTER: B.P., 11¼d.

POTASSIUM PRUSSIATE.—LONDON: Yellow, 8¼d. to 8¾d. per lb. SCOTLAND: Yellow spot, 8¼d. ex store. MANCHESTER: Yellow, 8¼d.

SALAMMONIAC.—First lump spot, £41 17s. 6d. per ton d/d in barrels.

SODA ASH.—58% spot, £5 12s. 6d. per ton f.o.r in bags.

SODA, CAUSTIC.—Solid 76/77° spot, £13 17s. 6d. per ton d/d station. SCOTLAND: Powdered 98/99%, £17 10s. in drums, £18 5s. in casks, Solid 76/77°, £14 12s. 6d. in drums; 70/73%, £14 12s. 6d., carriage paid buyer's station, minimum 4-ton lots; contracts 10s. per ton less. MANCHESTER: £13 5s. to £14 contracts.

SODA CRYSTALS.—Spot, £5 to £5 5s. per ton d/d station or ex depot in 2-cwt. bags.

SODIUM ACETATE.—£22 per ton. LONDON: £22. SCOTLAND: £20.

SODIUM BICARBONATE.—Refined spot, £10 10s. per ton d/d station in bags. SCOTLAND: Refined recrystallised £10 15s. ex quay or station. MANCHESTER: £10 10s.

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

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

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

SODIUM CHLORATE.—£32 10s. per ton.

SODIUM CHROMATE.—4d. per lb. d/d U.K.

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

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

SODIUM IODIDE.—B.P., 6s. per lb.

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

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

SODIUM PHOSPHATE.—£13 per ton.

SODIUM PRUSSIATE.—LONDON, 5d. to 5½d. per lb. SCOTLAND: 5d. to 5¾d. ex store. MANCHESTER: 5d. to 5½d.

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

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

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

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

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

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

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

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

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

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

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

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

ZINC SULPHIDE.—11d. to 1s. per lb.

Coal Tar Products

ACID, CARBOLIC.—Crystals, 7¾d. to 8¼d. per lb.; crude, 60's, 1s. 1½d to 2s. 2½d. per gal. MANCHESTER: Crystals, 8d. per lb.; crude, 2s. to 2s. 1d. 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. 4d.; dark, 95/97%, 1s. SCOTLAND: Pale, 99/100%, 1s. 3d. to 1s. 4d.; dark, 97/99%, 1s. to 1s. 1d.; high boiling acid, 2s. 6d. to 3s.

BENZOL.—At works, crude, 9½d to 10d. per gal.; standard motor, 1s. 3d. to 1s. 3½d.; 90%, 1s. 4d. to 1s. 4½d.; pure, 1s. 7½d. to 1s. 8d. LONDON: Motor, 1s. 3½d. SCOTLAND: Motor, 1s. 6¾d.

CREOSOTE.—B.S.I. Specification standard, 5½d. to 5¾d. per gal. f.o.r. Home, 3¾d. d/d. LONDON: 4½d. f.o.r. North; 5d. London. MANCHESTER: 5d. to 5¾d. SCOTLAND: Specification oils, 4d.; washed oil, 4½d. to 4¾d.; light, 4¼d.; heavy, 4½d. to 4¾d.

NAPHTHA.—Solvent, 90/100%, 1s. 5d. to 1s. 6d. per gal.; 95/160%, 1s. 6d.; 99%, 11d. to 1s. 1d. LONDON: Solvent, 1s. 3¼d. to 1s. 4½d.; heavy, 11d. to 1s. 0¼d. 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, 40s. per ton. LONDON: 45s. per ton, f.o.b. East Coast port. MANCHESTER: 35s. f.o.b. East Coast.

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

TOLUOL.—90%, 1s. 11d. to 2s. per gal.; pure, 2s. 2d.

XYLOL.—Commercial, 1s. 11d. to 2s. per gal.; pure, 2s. 1d. to 2s. 2d

Nitrogen Fertilisers

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

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

NITRATE OF SODA.—£7 12s. 6d. per ton for delivery to June, 1935, in 6-ton lots, carriage paid to farmer's nearest station for material basis 15.5% or 16% nitrogen.

NITRO-CHALK.—£7 5s. per ton to June, 1935, in 6-ton lots carriage paid for material basis 15.5% nitrogen.

CONCENTRATED COMPLETE FERTILISERS.—£10 5s. to £10 17s. 6d. per ton according to percentage of constituents, for delivery up to June, 1935, in 6-ton lots carriage paid.

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

Latest Oil Prices

LONDON, May 22.—LINSEED OIL was quiet. Spot, £23 15s. per ton (small quantities); June, £21 5s.; June-Aug., £21 7s. 6d.; Sept.-Dec., £21 17s. 6d.; Jan.-April, £22 5s. naked. SOYA BEAN OIL was quiet. Oriental (bulk), May-June shipment, £20 5s. per ton. RAPE OIL was firm. Crude extracted, £33 per ton; technical refined, £34 10s., naked, ex wharf. COTTON OIL was quiet. Egyptian crude, £25 per ton; refined common edible, £28; and deodorised, £30, naked, ex mill (small lots £1 10s. extra). TURPENTINE was easier. American spot, 56s. per cwt.; June, 46s.

HULL.—LINSEED OIL.—Spot quoted £22 2s. 6d. per ton; May, £21 12s. 6d.; June-Aug., £21 17s. 6d.; Sept.-Dec., £22. COTTON OIL.—Egyptian crude, spot, £25 per ton; edible refined, spot, £27 10s.; technical, spot, £27 10s.; deodorised £29 10s., naked. PALM KERNEL OIL.—Crude, f.m.q. spot, £21 10s. per ton, naked. GROUNDNUT OIL.—Extracted, spot, £33 10s. per ton; deodorised, £36 10s. RAPE OIL.—Extracted, spot, £32 per ton; refined, £33 10s. SOYA OIL.—Extracted, spot, £25; deodorised, £28 per ton. CASTOR OIL.—Pharmaceutical, 41s. per cwt.; first, 36s. per ton; second, 33s. COD OIL, f.o.r or f.a.s., 25s. per cwt. in barrels. TURPENTINE.—American, spot, 57s. per cwt.

Company News

A. B. Fleming and Co., Ltd.—The directors have recommended a final dividend of 7½ per cent., less tax at 4s. 6d. in the £, payable on June 10, making 12½ per cent for the year.

Reckitt and Sons.—Payment of 5 per cent. on the ordinary shares and a quarterly dividend and interest on 4½ per cent. and, 5 per cent. preference shares and 4 per cent. debenture stock, is to be made on July 1.

Neuchatel Asphalte Co.—A dividend of 6d. per share, or 2½ per cent., is declared on the ordinary shares for 1934. This compares with 1½ per cent. paid for each of the last three years and 2½ per cent. for 1930.

Chloride Electrical Storage Co.—For the year to March 31 last, the profit is shown at £422,000, comparing with £244,910 for 1933-34. The year's dividend on the "A" and "B" ordinary capital is repeated at 10 per cent., and accompanied by a bonus distribution of 5 per cent., while the reserve allocation is raised from £125,000 to £150,000.

Fison, Packard and Prentice, Ltd.—An interim dividend of 2½ per cent. is announced on the ordinary shares ranking for full dividend. A dividend of 1¼ per cent., less tax, is to be paid on the ordinary shares allotted to shareholders of George Hadfield and Co., these shares ranking as from December last. No interim was paid for last year, but a dividend of 7½ per cent. was distributed for the full year.

B. Laporte, Ltd.—The report of the directors for the year to March 31, 1935, shows that the net profit for the year amounted to £77,104, and £20,079 was brought in. A final dividend is to be paid on the ordinary shares at the rate of 15 per cent., making 20 per cent. for the year; £11,000 transferred to income tax reserve; £1,000 to directors' special remuneration; £4,000 to pension and benevolent fund; £1,000 to investments reserve account; £17,705 to general reserve account; leaving to be carried forward, £19,988.

Fullers' Earth Union.—The report for the year to March 31 last shows trading profit, £36,476 (against £25,422); add interest, rents, etc., making £39,175 (£29,010); less depreciation, £10,546 (£9,206); tax, etc., £6,938 (£5,692); interest on bank overdraft, £188; fees, £1,500; profit, £20,003 (£12,612); add £1,830 brought in, making £21,833; £7,000 to reserve; final dividend on ordinary, 10 per cent., making 12 per cent., and bonus 6d. per share (last year 10 per cent. dividend), leaving to be carried forward, £3,217.

Pease and Partners.—The trading profits for the year to March 31 last, show a further recovery at £193 427, compared with £159,212 for the previous year and £80,689 for 1932-33. Income from interest, dividends, etc., was higher at £22,261, compared with £20,203, and after providing for the maintenance of idle establishments, etc., and loan interest etc., there is a profit of £169,819, against £134,897 a year ago. Debenture interest takes £16,000, and £30,255 is provided for depreciation of plant, and £15,000 for depreciation of investments. Last year plant depreciation took £31,974, and £40,000 was placed to investment depreciation reserve; £30,000 is placed to renewals and improvements reserve. A balance of £78,564 remains, after these allocations, of which £27,803 is carried forward, leaving "available profits" of £50,760, against £16,920, to be applied towards redemption of debentures and credit notes.

Chemical and Allied Stocks and Shares

Current Quotations

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

Name	May 21.	May 14.
Anglo-Persian Oil Co., Ltd. Ord.	60/-	54/4½
,, 8% Cum. Pref.	37/-	36/3
,, 9% Cum. Pref.	38/-	38/-
Associated Dyers and Cleaners, Ltd. Ord.	2/2¼	2/2¼
,, 6½% Cum. Pref.	4/8¼	4/8¼
Associated Portland Cement Manufacturers, Ltd. Ord.	49/6	50/-
,, 5½% Cum. Pref.	27/9	27/9
Benzol & By-Products, Ltd. 6% Cum. Part Pref.	2/6	2/6
Berger (Lewis) & Sons, Ltd. Ord.	61/3	61/3
Bleachers' Association, Ltd. Ord.	5/-	5/-
,, 5½% Cum. Pref.	6/3	6/10½
Boake, A., Roberts & Co., Ltd. 5% Pref. (Cum.)	21/3	21/3
Boots Pure Drug Co., Ltd. Ord. (5/-)	48/3	48/-
Borax Consolidated, Ltd. Pfd. Ord. (£5)	96/3	96/3
,, Defd. Ord.	15/3	15/-
,, 5½% Cum. Pref. (£10)	225/-	220/-
,, 4½% Deb. (1st Mort.) Red. (£100)	£109	£109
,, 4½% 2nd Mort. Deb. Red. (£100)	£102	£102
Bradford Dyers' Association, Ltd. Ord.	7/6	7/6
,, 5% Cum. Pref.	8/9	8/9
,, 4% 1st Mort. Perp. Deb. (£100)	£82	£82
British Celanese, Ltd. 7% 1st Cum. Pref.	26/9	26/6
,, 7½% Part. 2nd Cum. Pref.	19/6	18/6
British Cotton & Wool Dyers' Association Ltd. Ord. (5/-)	5/-	5/3
,, 4% 1st Mort. Deb. Red. (£100)	£92	£90
British Cyanides Co., Ltd. Ord. (2/-)	3/-	3/-
British Drug Houses, Ltd. Ord.	18/9	18/9
,, 5% Cum. Pref.	22/6	22/6
British Glues and Chemicals, Ltd. Ord. (4/-)	4/3	3/6
,, 8% Pref. (Cum. and Part.)	26/10½	26/10½
British Oil and Cake Mills, Ltd. Cum. Pfd. Ord.	46/3	45/7½
,, 5½% Cum. Pref.	26/3	26/3
,, 4¼% First Mort. Deb. Red. (£100)	£108/10/-	£108/10/-
British Oxygen Co. Ltd. Ord.	91/3	88/9
,, 6½% Cum. Pref.	31/10½	31/10½
British Portland Cement Manufacturers, Ltd. Ord.	85/-	85/-
,, 6% Cum. Pref.	29/-	29/-
Bryant & May, Ltd. Pref.	67/6	67/6
Burt, Boulton & Haywood, Ltd. Ord.	19/4½	19/4½
,, 7% Cum. Pref.	27/6	27/6
,, 6% 1st Mort. Deb. Red. (£100)	£105/10/-	£105/10/-
Bush, W. J., & Co., Ltd. 5% Cum. Pref. (£5)	105/-	105/-
,, 4% 1st Mort. Deb. Red. (£100)	£96/10/-	£96/10/-
Calico Printers' Association, Ltd. Ord.	8/9	8/9
,, 5% Pref. (Cum.)	15/7½	15/7½
Cellulose Acetate Silk Co., Ltd. Ord.	13/9	15/7½
,, Deferred (1/-)	2/10½	3/4½
Consett Iron Co., Ltd. Ord.	7/-	7/3
,, 8% Pref.	21/10½	18/9
,, 6% First Deb. stock, Red. (£100)	£97/10/-	£97/10/-
Cooper, McDougall & Robertson, Ltd. Ord.	33/9	32/6
,, 7% Cum. Pref.	29/-	29/-
Courtaulds, Ltd. Ord.	53/9	52/9
,, 5% Cum.	26/3	26/3
Crosfield, Joseph, & Sons, Ltd. 5% Cum. Pre-Pref.	25/-	25/-
,, Cum. 6% Pref.	28/9	28/9
,, 6½% Cum. Pref.	28/9	28/9
,, 7½% "A" Cum. Pref.	30/7½	30/7½
Distillers Co., Ltd. Ord.	94/-	91/6
,, 6% Pref. Stock Cum.	32/-	32/-
Dorman Long & Co., Ltd. Ord.	14/3	11/3
,, Prefd. Ord.	13/9	11/3
,, 6½% Non-Cum. 1st Pref.	19/6	19/-
,, 8% Non-Cum. 2nd Pref.	14/3	13/-
,, 4% First Mort. Perp. Deb. (£100)	£102/10/-	£102/10/-
,, 5% 1st Mort. Red. Deb. (£100)	£104	£103

Name	May 21.	May 14.
English Velvet & Cord Dyers' Association, Ltd. Ord.	4/4½	4/4½
,, 5% Cum. Pref.	7/6	7/6
,, 4% First Mort. Deb. Red. (£100)	£70	£70
Fison, Packard & Prentice, Ltd. Ord.	38/9	38/9
,, 7% Non-Cum. Pref.	30/-	30/-
,, 4½% Debs. (Reg.) Red. (£100)	£107	£107
Gas Light & Coke Co. Ord.	27/9	27/9
,, 3½% Maximum Stock (£100)	£87/10/-	£87/10/-
,, 4% Consolidated Pref. Stock (£100)	£106/10/-	£106/10/-
,, 3% Consolidated Deb. Stock, Irred. (£100)	£90/10/-	£90/10/-
,, 5% Deb. Stock, Red. (£100)	£117/10/-	£117/10/-
,, 4½% Red. Deb. Stock (1960-65) (£100)	£113/10/-	£113/10/-
Goodlass Wall & Lead Industries, Ltd. Ord. (10/-)	12/6	12/6
,, 7% Prefd. Ord. (10/-)	13/1½	13/1½
,, 7% Cum. Pref.	27/6	27/6
Gossage, William, & Sons, Ltd. 5% 1st Cum. Pref.	24/4½	24/4½
,, 6½% Cum. Pref.	28/1½	28/1½
Imperial Chemical Industries, Ltd. Ord.	34/9	35/-
,, Deferred (10/-)	8/6	8/6
,, 7% Cum. Pref.	33/9	34/-
Imperial Smelting Corporation, Ltd. Ord.	15/-	12/6
,, 6½% Pref. (Cum.)	23/1½	22/6
International Nickel Co. of Canada, Ltd. Cum.	$29⅛	$29½
Johnson, Matthey & Co., Ltd. 5% Cum. Pref. (£5)	95/-	95/-
,, 4% Mort. Deb. Red. (£100)	£98/10/-	£98/10/-
Laporte, B., Ltd. Ord.	112/6	117/6
Lawes Chemical Manure Co., Ltd. Ord. (10/-)	5/7½	8/7½
,, 7% Non-Cum. Part Pref. (10/-)	10/-	10/-
Lever Bros., Ltd. 7% Cum. Pref.	32/9	32/9
,, 8% Cum. "A" Pref.	33/6	33/6
,, 20% Cum. Prefd. Ord.	78/1½	78/1½
,, 5% Cons. Deb. (£100)	£108	£108
,, 4% Cons. Deb. (£100)	£105	£105
Magadi Soda Co., Ltd. 12½% Pref. Ord. (5/-)	1/3	1/3
,, 6% 2nd Pref. (5/-)	6d.	6d.
,, 6% 1st Debs. (Reg.)	58/-	58/-
Major & Co., Ltd. Ord. (5/-)	7½d.	7½d.
,, 8% Part. Prefd. Ord. (10/-)	9d.	9d.
,, 7½% Cum. Pref.	1/6⅜	1/6⅜
Mond Nickel Co., Ltd. 5½% Mort. Deb. Red. (£100)	£103	£103
Pinchin, Johnson & Co., Ltd. Ord. (10/-)	43/-	43/-
,, 7% Cum. Pref.	25/-	22/6
Potash Syndicate of Germany (Deutsches Kalisyndikat G.m.b.H.) 7% Gld. Ln. Sr. "A" and "B" Rd.	64/6	64/6
Reckitt & Sons, Ltd. Ord.	113/9	113/1½
,, 4½% Cum. 1st Pref.	25/-	25/-
Salt Union, Ltd. Ord.	41/3	36/10½
,, Pref.	45/-	44/4½
,, 4½ Deb. (£100)	£111/10/-	£111/10/-
South Metropolitan Gas Co. Ord. (£100)	£132/10/-	£132/10/-
,, 6% Irred. Pref. (£100)	£149/10/-	£149/10/-
,, 4% Pref. (Irred). (£100)	£106/10/-	£106/10/-
,, Perpetual 3% Deb. (£100)	£89/10/-	£89/10/-
,, 5% Red. Deb. 1950-60 (£100)	£115/10/-	£115/10/-
Staveley Coal & Iron Co., Ltd. Ord.	43/9	42/6
Stevenson & Howell, Ltd., 6½% Cum. Pref.	26/3	26/3
Triplex Safety Glass Co., Ltd. Ord. (10/-)	68/9	68/1½
Unilever, Ltd. Ord.	29/4½	28/9
,, 7% Cum. Pref.	30/3	29/9
United Glass Bottle Manufacturers, Ltd. Ord.	39/4½	39/4½
,, 7½% Cum. Pref.	33/-	33/-
United Molasses Co., Ltd. Ord (6/8)	20/7½	20/-
,, 6% Cum. Pref.	25/-	25/-
United Premier Oil & Cake Co., Ltd. Ord. (5/-)	4/9	4/9
,, 7% Cum. Pref.	25/-	25/-
,, 6% Deb. Red. (£100)	£102	£102

From Week to Week

AN IMPORT DUTY of 3s. per cwt. on dextrine and starch has been imposed by the Irish Free State Government, as from May 16.

BRITISH HYDROGENATION, LTD., has increased its nominal capital by the addition of £19,000 beyond the registered capital of £1,000.

A DIPLOMA IN CHEMICAL ENGINEERING, which will be post-graduate, has been instituted by the Manchester University. In anticipation of that departure two students are already in attendance seeking to qualify.

A LARGE WORKS for manufacturing patent fertilisers at Connah's Quay, Liverpool, was practically gutted by fire on May 14. The business is carried on by the Organic Ammonia Co., patent fertiliser manufacturers, of Glasgow.

RAILWAY PROBLEMS formed the subject of a paper read at the Industrial Transport Association Conference at Liverpool on May 17, by Mr. H. R. Caulfield Giles, traffic manager of Newton, Chambers, and Co., Ltd.

"WELDING in Relation to General Repair Work" was the subject of the paper contributed by Mr. C. W. Brett, managing director of Barimar, Ltd., to the symposium organised by the Iron and Steel Institute, held at the Institute of Civil Engineers on May 2.

IN THE ARTICLE on "One Hundred Years of Chemical Engineering" in THE CHEMICAL AGE of May 11 (pages 419-421), the illustration referred to as a high vacuum glycerine distillation plant should have been described only as a concentrating plant, while the second illustration, described as a high vacuum fatty acid distillation plant, was only a deodorising plant.

NEARLY FIFTY FOOD SCIENTISTS will leave London next week to take part in a tour of French and Belgian municipal and industrial laboratories. They are members of the Food Group of the Society of Chemical Industry and they will inspect continental methods of food production and scientific control. They will be led by Dr. L. H. Lampitt, chairman of the group.

A CONSIGNMENT OF VITREOSIL (fused silica) hydrochloric acid plant parts was despatched on May 16 for Japan from the works of the Thermal Syndicate, Ltd., Wallsend-on-Tyne. This included vitreosil burner jets, combustion chambers, S-bends for cooling and absorption vessels of the special design made for the absorption of hydrochloric acid gas.

A NEW EPSOM SALT plant has been opened at Mithapur in Kathiawar as a subsidiary of the Okha Salt Works. The first subsidiary industry was the manufacture of magnesium chloride which has already captured international markets. The programme of the Okha Salt Works for the next season is 100,000 tons and they expect to reach 300,000 tons within the next five years.

IT IS REPORTED by the senior British Trade Commissioner in Montreal that the producers of soya bean oil in Canada have disposed of all their stocks, and will not have further quantities to offer until after the next Canadian harvest. The Commissioner of Customs has therefore ruled that the importation of both crude and refined soya bean oil will now be accepted without application of special or dumping duties until about October 1.

A LECTURE ON "GAS DEFENCE" will be given by Mr. J. Davidson Pratt, general manager and secretary of the Association of British Chemical Manufacturers at the annual general meeting of the British Science Guild, on June 12, at which Lord Melchett will preside. The meeting and lecture will take place in the Lecture Theatre of the Royal Society of Arts, and tickets (for which there is no charge) may be obtained on application to the Secretary of the British Science Guild, 6 John Street, Adelphi, London, W.C.2.

BOOTS PURE DRUG CO., LTD., has just published a booklet on "Boots products in the treatment of the anæmias," for the information of the medical profession. The object of the booklet is to give a short account of the general principles of the treatment of the anæmias with particular reference to the use of the products of the laboratories of Boots Pure Drug Co., Ltd. In addition to a description of the modern treatment of the anæmias, the booklet contains monographs on Boots liver preparations for parenteral and oral administration, Pepsac (dessiccated stomach substance), and Livron (compound liver extract and iron).

MEMBERS OF THE BURY CORPORATION AMBULANCE SERVICE made a successful attempt on May 17 to save the life of a man who had been gassed at Arthur Ashworth's Chemical Works, Fernhill, Bury. The man was Mr. Harry Hope (55), of Bury, and he was discovered suffering from the effects of sulphur dioxide gas by other employees of the firm. The ambulance men tried artificial respiration for about an hour, although it seemed at first that their efforts were doomed to failure. The Novox artificial respiratory apparatus was used during the journey to the Bury Infirmary, where the man eventually regained consciousness.

CHEMICALS AND CHEMICAL PRODUCTS imported into the Irish Free State during March last were valued at £135,055, as compared with £131,746 in the corresponding month of 1934.

THE FIFTEENTH CONGRESS OF INDUSTRIAL CHEMISTRY, which is to be held in Brussels from September 22 to September 28, has been accorded the patronage of the King of the Belgians.

ENGLISH CLAYS, Lovering, Pochin and Co., Ltd., and the Anchor Chemical Co., Ltd., have each subscribed £105 to King George's Jubilee Trust, and the workmen and staff of the Manchester Oxide Co. have subscribed £2 1s. 7d.

"THE INDIAN SUGAR INDUSTRY" is the subject of a paper to be read before the Royal Society of Arts in London, on May 31, by Mr. B. C. Burt, expert adviser to the Imperial Council of Agricultural Research.

THE PRODUCTION OF WOOD PULP CONTAINERS at Lillyburn Works, Milton of Campsie, which were recently taken over by Universal Pulp Containers, Ltd., is expected to begin operations on May 27. It is anticipated that when the works are in full production over 100 workers will be employed.

FOUR CHEMISTS and a whaling inspector were landed from the British whale oil factory ships "Southern Princess" and "Southern Empress," when they put into Brixham on May 15 and 17 respectively. They reported that the voyage home from the Antarctic, via Durban, had been uneventful.

A JOINT CONFERENCE at Manchester, on May 16, between representatives of the Allied Association of Bleachers, Dyers, Printers and Finishers, and the Federation of Unions in the Bleaching, Dyeing, Finishing and Calico Printing Trades has opened negotiations for a new agreement in the dyeing industry, to regulate hours and conditions of employment.

A JOINT SCOTTISH MEETING of the Chemical Society, the Institute of Chemistry, and the Society of Chemical Industry, was held in the Chemistry Department of the Marischal College, Aberdeen, on May 17. Professor Alexander Findlay presided. A paper was read by Dr. Ian M. Robertson on "The Agricultural Utilisation of Peat Land."

THE BRITISH STANDARDS INSTITUTION has issued the second of the projected series of specifications for land boilers. This specification deals with horizontal multi-tubular boilers of dry-back and waste heat types, and is generally similar to the specification issued last year for Lancashire and Cornish boilers. It includes, however, appropriate provisions and rules for tubes and bar stays.

THE BUNDI CEMENT CO. reports that there were record sales during last year, the quantity produced rising from 94,000 tons to 119,000 tons. The various uses to which cement can be put are becoming better known throughout India, and a further increase in the demand is anticipated. A total dividend of 15 per cent. has been declared and a special capital bonus of Rs.10 lakhs out of the reserve fund has also been declared.

THE BRITISH STANDARDS INSTITUTION is holding its annual meeting on the morning of May 28, subsequent to which a luncheon will be held at the Royal Automobile Club. Dr. E. L. Burgin, Parliamentary Secretary to the Board of Trade, and the Rt. Hon. G. W. Forbes, Prime Minister of New Zealand, will be the chief speakers. Mr. Forbes takes great personal interest in this work; the other Dominions will also be represented. Dr. E. F. Armstrong, F.R.S., the retiring chairman of the Institution, will preside, supported by Mr. W. Reavell (Ipswich), the newly-elected chairman for the forthcoming year.

THE PAPERS read before the Fourteenth Congress of Industrial Chemistry in Paris last October, are now published in the form of separate pamphlets. They may be obtained from the Société de Chemie Industrielle, 28 rue Scuntsominique, Paris 7e, the prices for single copies of papers ranging from 5 to 17 frs. The complete transactions of the congress, bound in two volumes, are also published, at 150 frs., as are the papers read at the Symposium on laboratory glassware at the exhibition of laboratory equipment, the latter at a price of 20 frs.

THE ASSOCIATION OF BRITISH CHEMICAL MANUFACTURERS is one of the thirty-four national organisations comprising the membership of the British Road Federation, which held its annual meeting in London on May 17. Attention was drawn in the annual report to the fact that 1934 had been a year of outstanding importance from the point of view of the road motor transport industry, commencing as it did with the coming into operation of the heavily increased rates of taxation on goods motor vehicles provided for in the Finance Act of 1933, followed by the inauguration of the system of licensing of goods vehicles under the Road and Rail Traffic Act, 1933, and the placing on the Statute Book of the Road Traffic Act, 1934. The conditions under which the goods carrying side of the industry operates have, therefore, in particular, undergone very material changes, the full results of which have yet to be seen. The work of the Federation has been of corresponding importance.

Commercial Intelligence

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

County Court Judgments

(NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court Judgments against him.)

DOUBLEX, LTD., 20 Chaplin Road, E. 15, chemical manufacturers and soap makers. (C.C., 25/5/35.) £16 10s. 11d., April 15; £22 19s. 9d., April 12.

BEAUCAIRE LABORATORIES (a firm), 14 America Square, E.C.3, manufacturing chemists. (C.C., 25/5/35.) £11 12s. 6d., April 11.

Mortgages and Charges

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

ARDAL, LTD., Bristol (M., 25/5/35). Reg. May 9, £100 debs., part of £2,500 already reg. *Nil. October 23, 1934.

CASCELLOID, LTD., Leicester (M., 25/5/35). Reg. May 8, charge, to Westminster Bank, Ltd., securing all moneys due or to become due to the bank; charged on land at Leicester, etc. *£26,730. March 26, 1934.

METALIN, LTD., Bletchley (M., 25/5/35). Reg. May 9, £800 debs., part of £5,000 already reg. *£1,900 debs. October 12, 1934.

Satisfactions

ABERTHAW AND BRISTOL CHANNEL PORTLAND CEMENT CO., LTD., Cardiff (M.S., 25/5/35). Satisfaction reg. May 14, of deb. stock reg. April 2, 1924, in full, and the unissued balance of £50,000 cancelled.

BROOM AND WADE, LTD. (old co.), High Wycombe (M.S., 25/5/35). Satisfaction reg. May 9, of deb. reg. October 29, 1927.

EASTWOODS CEMENT, LTD., London, S.E. (M.S., 25/5/35). Satisfaction reg. May 14, of deb. reg. July 4, 1932, to extent of £10,000, the balance.

GEORGE HADFIELD AND CO., LTD., Liverpool (M.S., 25/5/35). Satisfaction reg. May 4, of deb. reg. February 18, 1919.

Deed of Arrangement

(The following deeds of arrangement with creditors have been filed under the Deeds of Arrangement Act, 1914. Under this Act it is necessary that private arrangements other than those executed in pursuance of the Bankruptcy Act shall be registered within seven clear days after the first execution by the debtor or any creditor. These figures are taken from the affidavit filed with the registered deed, but may be subject to variation on realisation.)

EMERY, Robt. Robinson, deed. (by exors.), Sandown, Cemetery Road, Shelton, colour mfr. (D.A., 25/5/35). Dated May 8, filed May 14. Trustee, R. E. Clark, 17 Albion Street, Hanley. Secured crs. £1,035; liabilities unsecured, £1,682; assets, less secured claims, £633.

London Gazette, etc.

Companies Winding-up Voluntarily

ASSOCIATED RUBBER MANUFACTURERS, LTD. (C.W.U.V., 25/5/35). By special resolution, May 7. George Warwick Smith, 79 Queen's Road, Bayswater, London, W.2, appointed liquidator.

Bankruptcy Proceedings

HULME AND KNOWLES. (B.P., 25/5/35). At the public examination of Stanley Hulme and John Knowles, trading in partnership as "Hulme and Knowles," Culcheth Brow, Clayton Bridge, Manchester, dyers, it was stated that the gross liabilities were £1,514, and there was a deficiency of £1,460. Debtors attributed their failure to inability to complete an agreement for the purchase of a dyeing and finishing business and loss incurred as the result of carrying on such business before the completion of the purchase. Mr. Knowles said that negotiations had taken place for the purchase of a dyeing business at Culcheth Brow. The business had been closed for eight months, and from May to November, 1934, the period in which debtors traded, a loss of £1,814 was sustained. They had paid £3,000 for the business. Hulme said that his father, who had advanced £1,000, would not lend them any more money. The examination was closed.

New Chemical Trade Marks

Compiled from official sources by Gee and Co., patent and trade mark agents, Staple House, 51 and 52 Chancery Lane, London, W.C.2.

Opposition to the registration of the following trade marks can be lodged up to June 8, 1935.

Benzorbon. 558,690. Class 1. Chemical substances used in manufactures, photography or philosophical research, and anti-corrosives. British Carbo-Union, Ltd., 52 Grosvenor Gardens, London, S.W.1. March 11, 1935.

Catalin. 556,985. Class 1. Synthetic resin being a chemical substance in liquid form for use as an ingredient in the manufacture of varnishes, paints, enamels and lacquers, and for use in impregnating wood, paper, textile materials and the like in the course of manufacture. Catalin Corporation of America (a Corporation duly incorporated and organised under the laws of the State of Delaware), Fores, State of New Jersey, United States of America. January 9, 1935. Address for Service in the U.K. is c/o Marks & Clerk, 57 and 58 Lincoln's Inn Fields, London, W.C.2. To be associated with No. 556,986 (2,974) 1.

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).

Canada.—A recently-established firm of sales engineers for electrical engineering equipment in Montreal desires to obtain United Kingdom agencies, on a commission or consignment basis, for the sale of heat-treating and annealing furnaces (electrical), crucibles and refractory materials in Canada. (Ref. No. 455.)

Morocco (Spanish Zone).—A firm of commission agents in Tetuan desires to establish connection with United Kingdom exporters of soap (mottled and yellow). (Ref. No. 470.)