# The Chemical Age

**A Weekly Journal Devoted to Industrial and Engineering Chemistry**

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# Notes and Comments

## Questions of Finance

ARE our chemical works at their highest peak of efficiency and of a sufficient size to take advantage of the increased demands with which they will certainly be faced in the future? In discussing this question last week we suggested that the far-seeing leaders of the industry should take advantage of the present favourable opportunity, with prices at their lowest and labour plentiful, of preparing for the future. To this it may be objected that the provision of the necessary capital is the difficulty, and in particular that the Banks will not look kindly upon the provision of money for such purposes. There is much in this contention and it is probable that all industry would benefit by prior financial arrangements. The Bank crisis in America has focussed attention upon the necessity for correct banking technique if similar difficulties are not to recur, and it is well that the proper function of banks in financing should be known. The majority of bank failures are due to an undue proportion of the funds of the banks being locked up in an unrealisable form. In America, for example, the banks which failed were for the most part overloaded with advances made against mortgages on real estate which could not be called in on short notice, or with loans made for capital purposes to companies which were unable to repay them. Since bank deposits are repayable on short notice, the banks clearly cannot lend for long terms, and they cannot, in particular, finance fixed capital assets. When trade is good banks may depart from this rule because the borrower expects to repay the loan quickly out of profits; similarly when trade is bad they may lend money for capital purposes because of the difficulty of finding proper employment for their funds. Experience seems to show, however, that a departure from the sound rules of banking is not, in the long run, in the best interests of trade, even though it may assist individual traders. The bankers may finance traders or the purchase of raw materials or other short-term transactions, but they must not invest money in plant or provide it for other capital purposes, which should be and must be the function of the investor and capitalist.

## A New Financing Organisation

THE ignorance of many heads of businesses on financial matters is abysmal. This is no disgrace to them, even though it be a heavy handicap. In these days of specialisation no one can aspire to very wide knowledge, but some knowledge of business finance is essential in every concern and it is well that the directorate should contain an expert upon such matters. The general manager who expected to get his plant financed when he had nothing to offer as security that was not already heavily mortgaged is not apocryphal—we have met him.

It would be of the utmost assistance to many businesses, particularly the smaller ones, if arrangements could be made for finance which would also involve placing the financial affairs of the firm under the direction of the financing house, by entitling them to have a financial representative on the board. Banks cannot take risks; the private investor and the financier can and does take risks. Banks, therefore, must look with suspicion on the idea of providing medium-term capital for small industries and small firms. Small firms have great difficulty in raising money from the public because of the expense and difficulty of creating a market in their securities. Since the banks cannot, or will not, meet this situation, something that can do so is required. One suggestion that has been made is worthy of close consideration. This is to the effect that a new type of financing organisation should be formed which should lend its own capital for industrial purposes. This capital could be raised by public issues and re-lent to small industrial and trading concerns. The organisation would safeguard the investor because it would only advance funds for sound and approved purposes, and it would equally advantage the manufacturer because it would check reckless borrowing and would give continuous expert advice on the financial side concerning the conduct of the business. Such an organisation must clearly be in the hands of financiers of the highest repute, and must be run for the mutual benefit of the lender and borrower without thought of making excessive profits for the financier. The concern would probably operate on so large a scale that an adequate return would be secured by charging only moderate fees on all transactions.

## Captains of Industry

THINGS have been happening during the past twenty years with a speed and intensity unequalled in the history of the world. There is complaint that investors are not putting their capital into new ventures; difficult as the times are, many new ventures are making money and are prospering. There is money for those who know how to steer; there is disaster for the inefficient. Those who do not venture to-day are those who are too timid, or too uncertain of their own powers to trust themselves at the wheel. Many of those who fail do so because they are lacking in that mixture of experience and creative courage which goes to the make-up of every successful business man. It has been truly said

that this generation should esteem itself fortunate in that it has a front seat in the great theatre where history is made, even though at times it finds itself unpleasantly involved in the events upon the stage. This is no time to have a tyro at the wheel. The solitary captain of industry of the Victorian era has been replaced by the board of directors. Are our boards of directors in the fullest sense of the term " Captains of Industry? "

There is an old story of a chairman, aged 94, who would not retire because he felt that his son aged 70 was lacking experience. It is a sad story because it was true and it is so often true to-day. If industry is to profit by the new day which is surely dawning, the direction of our industrial concerns must pass into the hands of those who are qualified by knowledge and skill to undertake the work, and must not remain in the hands of those who are only qualified by reason of holding a preponderance of the capital of the company. It is to the greatest advantage of the capitalist that his money shall be handled by those who are qualified to make the best use of it, and whom he can remove at the annual meeting, if he can convince his fellow capitalists that his managers are inefficient. When shall we reach the day upon which captaincy of industry, like captaincy in every other walk of life, depends solely upon fitness for the task? When that day comes, in many walks of life, not least in the chemical industry, the chemist and the physicist will be seen in many places which now seem barred to them.

## Technical Education

MANY must have considerable sympathy with the plea put forward by " A.I.C." in his letter which appeared in THE CHEMICAL AGE of April 22. There are few branches of industry—even of chemical industry —in which knowledge *per se* is the prime consideration of a man's worth. It is no doubt valuable that a man should have studied gamma functions and be *au fait* with the higher branches of spherical trigonometry; we know the value of these subjects as a mind developer too well to pour scorn upon them. But when a breakdown occurs at the works and everything just stops, the man we should prefer to have around is he who has " done his chemistry with a spanner " and who does not grumble if he has to put in a night shift to put things right. There is a place for the highly educated theorist, and there is a place for the man who has educated himself. When it comes to making a decision concerning the filling of the higher posts, that employer will gain who realises that the qualities that have caused a youth to burn the midnight oil in the pursuit of knowledge are those that, properly handled, will be of the greatest assistance to him in his business. To comparatively few is it given to leave school before matriculating and to proceed under their own steam to the higher University degrees. By suggesting that those who have done so are deserving of something more than commonplace notice, we shall in no way prejudice the University-trained student. Many University-trained students in later life occupy the highest posts in industry, and industry would do badly without their help. Many of the one class could not for one reason or another occupy the same position as the other class with equal facility.

There is a field for all. The one field which does not appear to be open to all is the University itself. We cannot recollect a single instance of a University selecting for a post on its teaching staff a man who has not passed through the doors of one or more of these learned institutions. In some instances, indeed, one is tempted to believe that the sure way to a professorship is to have attended not less than three different Universities. That, however, is by the way. We praise particularly the man who has forced his way to the front because it is generally sure evidence of the possession of a quality rather lacking to-day in all walks of life—individualism. We are to-day, as Dr. Lockhart reminds us, in danger of becoming thoroughly standardised. We all do the same things in the same way and we are even trying to force the essentially individualistic man into the narrowly circumscribed paths and modes of thought of the rest of the community. It is doubtful whether that can be done, but if it is done, the world and industry will be the losers. The fact that a man can break away from his fellows, can spend his money on education instead of motor-cycles, can spend his nights in the study of learned books rather than of (moving) pictures, is sure evidence that he possesses the type of mind that, given the opportunity, will plan new ventures and will break new ground.

## Imported Chemicals

BEFORE the adoption of tariffs there was no vital need for keeping a fully detailed record of imported goods, and even if there were a need the necessary machinery was no doubt lacking. But to-day, when every package must be examined and checked for duty, it is important that the Department of Customs and Excise should be able to furnish detailed statistics of chemical products imported into this country. Last year the total imports of chemicals were valued at £9,700,000, but it is impossible to obtain detailed information which would enable us to analyse this huge total and find out exactly how it is made up. No doubt a large proportion of it consists of raw materials which are not available in this country and must be imported in any event. Then there will be products such as calcium carbide, depending upon cheap water-power, which could not be made here on a competitive basis without a much higher measure of protection than that now accorded. But there must remain a substantial residuum of imported chemical products which could and should be made in this country both in the interests of relieving unemployment and of helping to redress the adverse trade balance.

Now that the British chemical manufacturer can look for protection over a reasonably long period, and can obtain increased protection in special cases where he can show good cause for this being done, he will no doubt find it worth his while to take up the manufacture of these products, and he should find no difficulty in displacing the foreign article now that " Buy British " may be said to have changed from a slogan to a national habit. We would, however, urge on Government Departments the necessity for helping industry to capture these markets by making available information which they either possess or could obtain without additional expenditure regarding the detailed figures for these chemical imports.

# Annual Meeting of the Chemical Engineering Group

## Lord Melchett on Modern Economics and Unemployment

THE annual meeting and dinner of the Chemical Engineering Group of the Society of Chemical Industry was held at the Waldorf Hotel, London, on April 28. Mr. J. Arthur Reavell, the retiring chairman of the Group, presided on both occasions.

Mr. DONALD MCDONALD, hon. secretary, reported that whilst there had been a slight fall in the membership during the year this need not be taken too seriously having in view the difficult circumstances which had existed. The Group was passing through the economic crisis with less trouble than many of the Societies which were doing similar work, but he urged the members to do all they could to bring the membership back to its former figures. Referring to the discussions that had taken place upon the address of the president of the Society at the annual meeting in Nottingham last July—in which the urgent need for co-operation and co-ordination between scientific and technical societies with a view to providing better service at a less cost with fewer societies and better meetings was emphasised—Mr. McDonald stressed the point that it has always been the aim of the Group to co-operate with other bodies of similar nature on every possible occasion. In this connection he pointed out that all the meetings arranged for the 1933-4 session were joint meetings with other societies.

After pointing out that the accounts for the past year showed a small excess of income over expenditure, the hon. secretary expressed the thanks of the commitee of the Group to the Council of the Society for its continued interest and encouragement and also recorded the appreciation of the committee of the work of Mr. C. J. T. Mackie, the assistant secretary, and his staff throughout the year.

Mr. W. A. S. CALDER
Elected Chairman of the Chemical Engineering Group at the fourteenth Annual Meeting on April 28.

The following elections were announced for the ensuing year: Chairman, Mr. W. A. S. Calder; hon. secretary, Mr. Donald McDonald; hon. treasurer, Mr. F. A. Greene; members of committee: Mr. A. W. K. Carnegy-Potts; Mr. J. M. Leonard; Dr. W. P. Joshua, and Mr. J. Arthur Reavell.

Votes of thanks were passed to the chairman (Mr. J. Arthur Reavell) and the hon. secretary and the hon. treasurer for their services during the year.

The guest of honour at the annual dinner which followed was Lord Melchett and among others present were Dr. R. H. Pickard, F.R.S. (president of the Society of Chemical Industry); Dr. E. F. Armstrong, F.R.S., Sir Frank Smith, F.R.S., Mr. H. Pooley (general secretary of the Society of Chemical Industry), Lord Leverhulme (president of the Institution of Chemical Engineers), Mr. J. Davidson Pratt (Association of British Chemical Manufacturers), Mr. E. A. Alliott, Dr. S. G. Barker, Mr. W. A. S. Calder, Dr. R. T. Colgate (hon. treasurer of the Society of Chemical Industry), Mr. H. W. Cremer (hon. secretary of the Institution of Chemical Engineers), Dr. W. Cullen, Sir Henry Fowler, K.B.E., Mr. George Gray, Dr. L. H. Lampitt, Dr. H. Levinstein, Mr. Donald McDonald, Mr. C. F. Mounsdon (president of the Diesel Engine Users Association), Mr. P. Parrish, Mr. F. H. Rogers, Mr. F. A. Greene, Mr. S. J. Tungay and Dr. A. J. V. Underwood.

Lord MELCHETT gave an address on "Modern Economics and Unemployment" in the course of which he said that within the last century the development of science had been such that there were practically no products which we could not produce to-day in almost unlimited quantities, for all practical purposes, and the difficulty was not one of production but of distribution, and it was in the distribution of the primary commodities that we had entirely failed hitherto. The list of primary commodities numbered about 26 but there was one which we were producing to-day at an alarming rate and with amazing efficiency which never appeared on that list, but which in future years must be included in it, *viz.*, leisure, and it was just as important to mankind as any of the others. We had been producing enormous quantities of leisure throughout the post-war period and he preferred this name to unemployment, because that seemed to him a misnomer.

More ways were being found for the individual man to increase his output to an alarming extent every day, and he was convinced that science would put more men out of work than any government would have the brains to put into work. Although that could be looked upon as a serious and terrible thing, the fact was that we had reached a stage in human development where we were able to afford a large amount of leisure to the masses of our population who, in the past, had not had the opportunity of enjoying any leisure at all, although we had not yet become used to conceiving that idea.

His own conception of this production of leisure brought about by the increased application of science to industry, and which could be expected to increase in the future, was that it could be used for the positive benefit of mankind. It was possible to regulate leisure within our own country in such a way as to obtain the maximum benefit from it instead of, as was the case to-day, making it one of the greatest evils that ever afflicted the human race. It was a terrible thing to contemplate that we were bringing up a generation of young men and young women, many of whom had never worked at

all, who had never known what it was to have to work and who had never been subjected to the normal discipline of any sort of regular occupation, and, moreover, who had not had the opportunity of acquiring at an early age skill in any sort of trade. We were at the present time bringing up a generation of people who were accustoming themselves to a low standard of living based upon idleness and who, in consequence, were developing the idea that there was no place for them in the world, that there was no necessity for their existence and that they might just as well be dead for all the world cared. That was a terrible thing to contemplate. These people were being under-fed, they were not too well housed and they were under-developed as we should feel that citizens of this country should develop. All this was tending to the breaking up of the national spirit or the national ideal which should be considered essential to the up-building of our national character. In these circumstances it was going to be hard to fit these people into industrial life as their fathers and grandfathers were brought into it.

## An Increasing Difficulty

This problem was not getting easier but more difficult. During 1934 he was told there would be 438,000 boys and girls of 14 leaving school and entering employment, as compared with 292,000 in 1932. That increase would continue and the peak would be reached in about 1937; therefore, a substantial improvement in industrial conditions was not going to solve this problem of the over-production of leisure. On the other hand, it was highly probable that between 1934 and 1937 methods would be devised—among others by some of those present that evening—which would have the effect of putting more people out of work than the increase in productive capacity would put into work.

Every employer of labour on a large scale to-day, continued Lord Melchett, is faced with the problem of deciding to perform his industrial operations with fewer men and greater efficiency or to keep on the same number of men and perform the operations with less efficiency and less economy. The majority of industrial employers would prefer to remain incompetent rather than put these men out of work but in the large organisations which existed to-day decisions had to be made on questions of high policy and with great heart searching, and those responsible for these large organisations had made up their minds that their first duty to their industry and to their country was to be as efficient as possible and to place on the nation as a whole the responsibility of solving this dreadful question of unemployment or, as he himself preferred to call it, the over-production of leisure. It was impossible to conceive of employers in every industry deliberately allowing themselves to become inefficient, however humanitarian or however sympathetic their reasons might be. If such were the case, the result for the nation as a whole would be disastrous; therefore we were bound to assume that the result of this problem of increased efficiency was not a matter for the individual employer.

## Pooling Employment and Leisure

Sooner or later we should have to organise the country in such a way as to shorten the hours worked, not by reducing the number of hours per day or the number of days per week but by pooling a man's unemployment and leisure together in such a way that he would have, under an organised system, a month, two months or even three months leisure allotted to him as a definite part of his employment. The man would be required to sign off for that period and then to sign on again under an organised system in which all workers would take part, but he should also be compelled to make profitable use of that period of leisure to improve his position intellectually and physically. At the present time the unemployed were wasting the leisure that was forced upon them and were a great source of expense to the nation without any result whatsoever, but under an organised scheme such as he had suggested a much larger number of people would be provided with work with a definite period of leisure of which they would be compelled to make profitable use. For instance, during the period of leisure, a subsistence rate of pay would be granted, but those who made the most profitable use of this period by improving their efficiency in the work in which they were engaged and in other ways—opportunities for which also, of course, would have to be on an organised basis—would receive higher payments and rewards.

If some such policy as this were adopted he was convinced that in five years there would be a dramatic and real change in the educational outlook of the population of the country. Another aspect of the problem, if it were tackled on these lines, was the opportunities that would be afforded for the real physical development of the people which at the present time was quite impossible. Why, said Lord Melchett, should the opportunities for such physical development be confined, as it was mainly to-day, to those who were fortunate enough to be sent to the public schools?

## The Financial Aspect

Coming to the financial aspect, Lord Melchett contended that such a scheme would not cost any considerable sum of money as compared with the cost of unemployment to the country at the present time, when 75 per cent. of the population were working with a fortnight's holiday each year, a most irrational system with so many unemployed. Undoubtedly there would be difficulties and obstacles but he did not believe there were any which could not be overcome. There would have to be licensing and the exemption of certain key men from the general rule, but he believed that such a system was the only solution to this fearful problem which was capable of sapping the most vital qualities upon which the nation had depended in the past.

Sir FRANK SMITH, secretary of the Department of Scientific and Industrial Research, proposing "The Society of Chemical Industry," said the Chemical Engineering Group was perhaps one of those sections of the community which were looked upon by some people as a curse of civilisation because its work was responsible for progress and there were a number of people in this country who did not like progress. It was, however, composed of people who made two blades of grass grow where only one grew before, and he did not know what the world would do without them. The process of greater and greater application of science to industry must go on because the whole history of that development had emphasised how much better off the world was for it. If we compared the present with the days when children were sent out to work at the age of six or seven, when the sanitary arrangements of the country were awful and the many other respects in which conditions were very different from what they were to-day, it must be appreciated that the improvement had taken place coincident with the application of science to industry and the general mechanisation of industry and looking at things from this point of view he could not help feeling that scientists and engineers were a jolly fine lot of fellows.

## Dr. Pickard and a Vicious Circle

Dr. R. H. PICKARD, F.R.S., president of the Society of Chemical Industry, with whose name the toast was coupled, said he was tempted to ask what was going to happen to the leisure of the research worker if all our leisure was to be organised. He could not imagine the secretary of the Royal Society devoting his leisure in any other way than continuing his scientific researches and that being so—and the same applied to all research workers—the amount of leisure now being super-abundantly produced would be still more super-abundantly produced as the result of the efforts of research workers in their organised leisure. There seemed the possibility of a vicious circle there, but perhaps Lord Melchett would say something about that at the Group dinner next year. Congratulating the Chemical Engineering Group on its virility and great success during the 15 years it had been in existence, Dr. Pickard said the Group made its first appearance at the annual meeting of the Society of Chemical Industry in Newcastle in 1919. The Society was again holding its annual meeting in Newcastle this year and a feature would be the large amount of time devoted to the proceedings of the different subject groups.

Mr. W. A. S. CALDER proposed the toast of "Our Guests," and Lord LEVERHULME responded.

Dr. H. LEVINSTEIN, proposing "The Chairman," spoke of the long service rendered to the Group by Mr. Reavell. Referring to Lord Melchett he suggested that there might yet come the time when Lord Melchett would set up a record in the presidency of the Society of Chemical Industry by following his grandfather and father in that position.

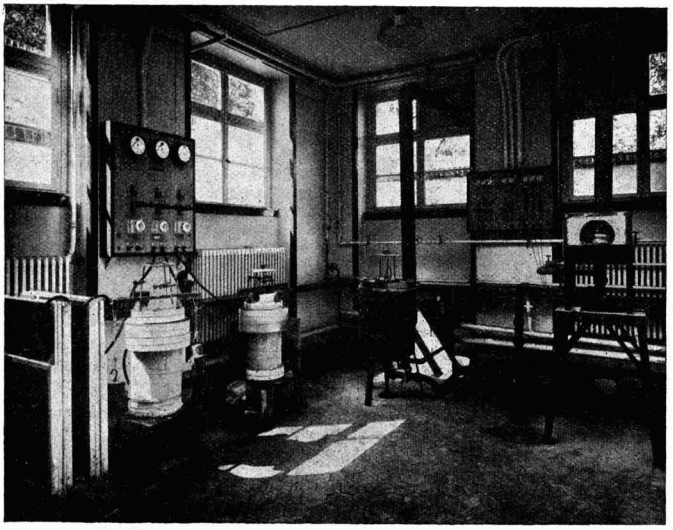
The CHAIRMAN briefly responded to the toast.

# A Notable German Research Centre

## The Metallgesellschaft Physico-Chemical and Metal Laboratories

The research laboratories of the Metallgesellschaft A.G. contain many novel features which might well be adopted in other laboratories. The following article, by Professor Dr. H. von Halban, is reprinted from a recent issue of the " Metallgesellschaft Periodic Review."

THE development of the research laboratories of the Metallgesellschaft A.G., at Frankfort-on-Main, has now reached a certain stage of finality with the completion of the new buildings for the physico-chemical and colloid-chemical laboratories. On account of its length, the physico-chemical laboratory was planned with a central corridor, on each side of which the work rooms are ranged, while the colloid-chemical laboratory has two central experimenting rooms, with the smaller rooms arranged around them. The individual laboratories are mostly lighted from above by skylights, so that the light conditions are specially favourable. In order to permit internal re-arrangements at any time by the shifting of walls and so on, it was decided that there should be no interior supporting walls, and the whole building, with the exception of the outside walls, was constructed as a steel skeleton.



The Physico-Chemical Laboratory : Section of Large Experimenting Room.

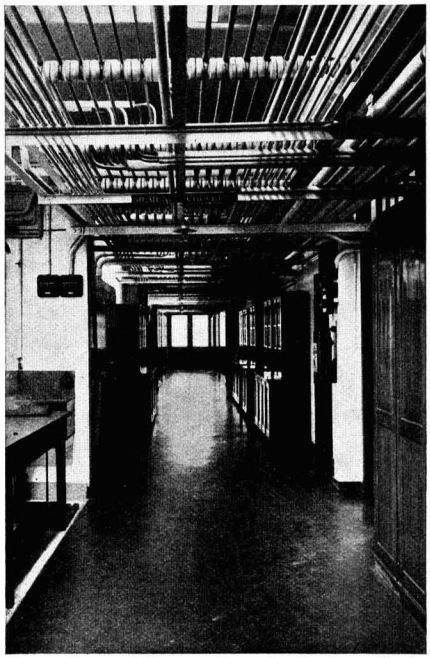
Each individual laboratory is connected to the main conduit in such a manner that a ring conduit is formed, the two ends of which are joined up to the main conduit so that no variations of pressure can arise. Warm water is for the present only supplied for the rinsing sinks. The steam conduit has a stop valve in every laboratory, so that a connection can be made at any time. The main conduits are provided with numerous T-pieces for new connections, when necessary. The service pipes provided are 1 inch gas, 1 inch water, and ¾ inch air. These are laid at a distance of 15 cm. from each other, none less than 1 m. above the floor and all with numerous T-pieces, the water pipes at the top, so that blast pumps can be connected. Two laths of wood run along the walls so as to allow pipes to be fixed without driving holes into the walls. Heavier objects can be fastened to screw pieces running through the walls. Below the pipe lines is a line of wooden shelving, 90 cm. high, against which the laboratory benches are placed; to this shelf discharge pipes are attached below all water taps. For each different conduit, taps and valves are fitted with different handles, as a safeguard against mistakes, especially in the dark. The various conduits are also painted in different colours.

Electric power is taken from the Frankfort electric works in the form of three-phase current, 5,000/220/127 volts, 50 periods. The laboratories are supplied with 3-phase current 3 .x 220/127 volts, continuous current at 110 volts, and continuous current at 2 .x 12 volts. For converting 3-phase current into continuous current of 110 volts, a motor generator with constant voltage (115 volts, capacity 16.5 kW), another with variable voltage (115/160 volts, 14 kW) and a mercury vapour rectifier with variable voltage (115/160 volts, 18 kW) is installed. The low tension continuous current is supplied by an accumulator battery of 60 cells with a capacity of 324 Ah and a discharge period of 3 hours. The battery, in which all the cells are connected in series, is charged either from the charging machine or the rectifier and connected in parallel in 5 groups at 2 .x 12 volts for discharging by means of a special switch. Provision has also been made for the supply of energy for small experiments from the battery while the charging is going on.

In all the laboratories uniform experimenting switchboards are installed supplying the three forms of current above mentioned. Each current can be cut off by lever switch, and is secured with special safety fuses. The terminals, provided with milled-edged nuts, allow the connecting wires to be inserted in a simple manner, and poles and phases are indicated. In the large experimenting room of the physico-chemical laboratory, a Siemens distributor by crossed copper rails allows each kind of current to be obtained one after the other at certain terminals, and, if required, several terminals can be connected in parallel to increase the strength of the current received.

The supply mains are laid on porcelain rollers under the ceiling of the corridor in such a way as to be easily accessible and are painted in the different standard colours, so that there can be no possibility of confusion. For the low tension continuous current (2 .x 12 volts) large cross sections were necessary on account of the relatively long distance involved. For lighting (3-phase, 220/127 volts) the lines are laid in Peschel tubing, and all branch lines are secured by small unipolar automatic switches. Large central lamps, Siemens indoor " lucettes " or workshop lights, are used, except in a few places, such as the weighing room, where wall brackets are installed.

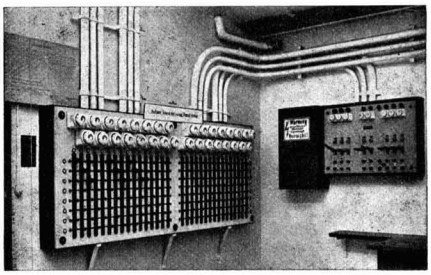
Some rooms are equipped for the most varied kinds of laboratory work, as for instance, those in the technico-chemical and physico-chemical laboratories, especially the large rooms in which massive apparatus has to be erected and large scale experimental work is carried out. Others are equipped for special purposes, *e.g.*, the X-ray rooms of the colloid-chemical and metal laboratories. The question as to where the technician or the director of the experimental work can best perform his clerical work has found no uniform solution. While in many cases the director of experimental work remains the whole time with his assistants in the laboratory itself, in other cases he has a special office room, which is not always immediately adjacent to the experimenting room. In the physico-chemical laboratory a compromise arrangement has been made which seems to work satisfactorily. A part of the laboratory is partitioned off with a wooden partition wall provided with glass windows, and fitted up as an office room. This arrangement allows the director to work with less disturbance than is possible in the laboratory itself, and at the same time he can always have an eye on the work going on there.



Physico-Chemical Laboratory: Central Corridor showing Supply Mains beneath Ceiling.

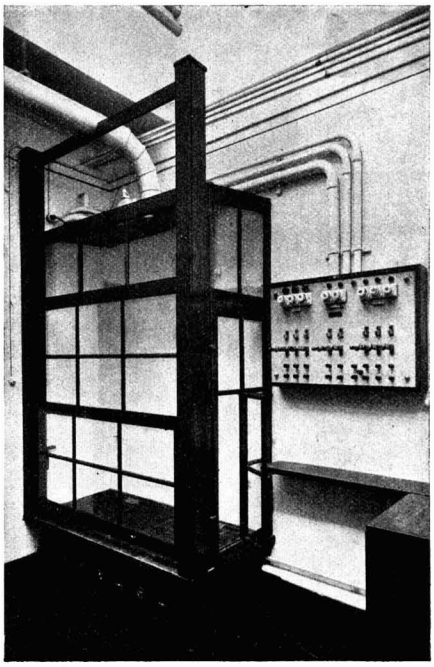
In planning the laboratories the great aim was to provide accommodation for the most varied purposes with the possibility of making alterations in the arrangement, when required, without difficulty. The pipes are everywhere fitted with numerous sleeves, which allow branch lines to be connected without loss of time. This is especially useful in the air extraction installation in the large rooms, where portable fume cupboards can be connected up by means of these sleeves. Some rooms are fitted with special darkening devices, which, both for upright windows and skylights, consist of wooden roller blinds, covered on the inside with a black fabric which is perfectly impervious to light, and running in deep grooves at the sides. They are worked by hand, in the same way as ordinary roller shutters, for the upright windows, and by means of a chain pull for the skylights.

In the metal laboratories there is a large mechanical testing room, which is fitted with every possible equipment required for the mechanical testing of metals, including a hydraulic machine for testing tensile strength and resistance to pressure and bending, with a maximum load of 30,000 k.g., and a bending machine for endurance tests. In the metallographical department there are, besides all the usual apparatus, a metal-microtome and spectrographs both for visible and ultra violet spectral rays, with all the accessories necessary for emission spectral analysis. The X-ray room equipment there is for the radioscopic testing of metals. In the corrosion room there is corrosion apparatus as specified by the Deutsche Versuchsanstalt für Luftfahrt, and a large corrosion chamber. For testing alloys for resistance to atmospheric influences, a " weather station " is installed on the roof.

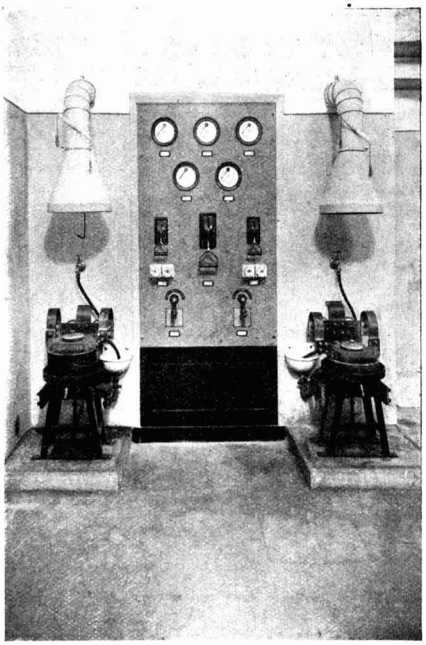


Crossed Copper Rail Distributor and Switchboard in Experimenting Room.

The two smelting rooms contain, among other things, four Tammann furnaces, each with a capacity of 22 kVA, three gas furnaces and a high frequency furnace (35 kVA). The engineering room contains machinery for rolling and pressing metals, a band rolling mill, a groove rolling mill, and an extrusion press whose pump has a hydraulic pressure of 300 atmospheres, while the press itself gives a pressure of 250 tons (diameter of ingot 75 mm, length 100 mm). In an extra room there are six continuous hammers and four machines which allow fatigue tests to be carried out under ordinary and high temperatures. In a special room for testing bearings are installed two twin testing machines (load 2,000 kg, 2,000 revolutions per min.); a testing bed for railway car



Fume Cupboard with Low Base as installed in one of the Laboratories.



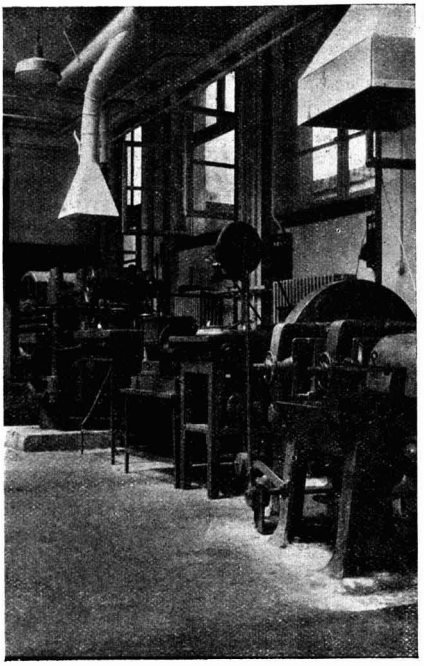
Metal Laboratory: Smelting Room with Tammann Furnaces and Switchboard.

Metal Laboratory: Apparatus for Corrosion Tests by the Deutsche Versuchsanstalt für Luftfahrt Method.

bearings (load 6 tons); machines for testing the wear and tear of bearing metals; and the Zeiss optimeter required for measuring the degree of wear and tear.

The completely equipped workshops contain all the necessary apparatus for the comparatively large amount of mechanical, plumbing, and locksmith's work that is required. There the numerous test pieces and rods are made for the tests carried out in the metal laboratory, and all kinds of testing apparatus are newly constructed, repaired and reconstructed. A glass blower, who has a completely equipped workshop entirely at his disposal, is continually occupied with glass-blowing work.

The equipment of the colloid-chemical laboratory satisfies all demands which can be made on an institute engaged in work of a colloid-chemical or colloid-physical nature. For the sphere of work to which it is at present devoting its chief attention (latex research and the development of new fields of application for latex), abundant provision has been made in a very extensive equipment of special apparatus. The optical workroom contains, among other things, a micro-manipulator for the illumination of light and dark fields, a



Colloid-Chemical Laboratory: Engineering Room with Mixers and Presses.

slit ultra-microscope of the newest construction with all the accessory apparatus, such as electrophoretic cuvettes, a cube for investigating gels, cuvettes for liquids capable of heating up to 300° C., micro-vulcanisation apparatus, micro-photographic and micro-cinematographic installations. Here there is a special X-ray room, containing a Phœnix tube with windows which serves for the investigation of colloid structures, such as the fibre diagrams of caoutchouc, cellulose, etc. The "technikum" contains not only all the machinery necessary for a normal rubber factory, such as mills, calenders, vulcanisers and presses, but also the additional apparatus required for working latex in accordance with our experience, such colloid as mills, cone mills, proofing and doubling machines. The colloid-chemical laboratory also possesses a laboratory filter press, a rotary vacuum filter constructed by the Buchau Maschinenfabrik, and a flotation chamber for the direct testing of rubber filter cloths and filter plates.

# Letters to the Editor

The Editor welcomes expression of opinion and fact from responsible persons for publication in these columns. Signed letters are, of course, preferred, but where a desire for anonymity is indicated this will invariably be respected. From time to time letters containing useful ideas and suggestions have been received, signed with a nom-de-plume and giving no information as to their origin. Correspondence cannot be published in THE CHEMICAL AGE unless its authorship is revealed to the Editor.

## Technical Education

SIR,—I was interested in the letter from "A.I.C." in THE CHEMICAL AGE of April 22, particularly with regard to evening students of technical colleges who work for external degrees. While agreeing with his suggestion that employers should fill posts with such students in preference to graduates direct from the Universities, my own experiences, as one of these students, do not apparently show that his suggestion is carried out by many employers in actual practice. There appears to be a strong feeling that the training received under these conditions is vastly inferior to that of the University student. A practical illustration of this attitude may be seen in the fact that a graduate fresh from a University is frequently offered a higher salary than a B.Sc. from the local technical college. Too often, a poor idea is held as to the laboratory equipment of such colleges. This can readily be seen from an actual experience of the writer, which there is reason to believe is by no means an isolated one. A few months before gaining a B.Sc. degree I was a candidate for a post as assistant works chemist. After having been questioned as to experience and chemical training, which had included five years as an evening student of a technical college; the question was asked "Can you use an analytical balance?" The Institute of Chemistry rather tends to maintain this view as it only accepts evening students as candidates for the associateship examination who have attended one or other of the rather limited number of technical colleges, approved by the Institute. This also penalises the impecunious student who through circumstances of locality has no chance of attending these colleges.

Even if there is a small measure of truth in these views, surely the incalculable four or five years' industrial experience received whilst obtaining an external degree by evening studies more than compensates for any slight shortcomings in the more theoretical aspects of chemical training. Often, in fact, by the time the degree has been obtained, the student possesses a sound knowledge of some branch of industry in addition. Such a student is likely to be of much greater value to an employer than a graduate straight from a University who frequently takes a considerable time to become acclimatised to actual industrial conditions. The technical colleges themselves might further the interests of this class of students, by pointing out, when opportunity occurs, the advantages of employing a man who by considerable sacrifice of both his leisure and usually limited financial resources, has obtained a theoretical and practical training in chemistry quite equal to that of the University graduate in this subject.

—Your faithfully,

"B.Sc."

# Dyeing of Glove Leather

By D. WOODROFFE, M.Sc., A.I.C.

IT has been found extremely difficult, if not almost impossible, to induce glove leather dyers to use coal tar dyestuffs. The application of such dyestuffs to gloving leathers, and particularly to alum tawed leather, has proved a very difficult proposition, and English glove leather manufacturers had become wedded to the methods which had been practised for decades, that it was of no avail to try and persuade them to adapt their methods to suit the application of modern products in dyeing and finishing their leathers. Glove leather may be either formaldehyde, oil, or alum tanned. The colouring of oil tanned leathers is even more difficult than that of alum tanned leather, and the writer does not propose to enlarge on the colouring and dressing of either oil tanned or formaldehyde tanned leathers, except to note that these leathers are easily dyed by means of sulphur colours, or by means of the acid or basic dyestuffs if the leather has been pre-treated with a suitable mordant, such as alum or chrome liquor or bichromate.

## French and English Methods

There are two methods of dyeing alum tawed gloving leathers which were generally practised up to quite recently—the French and the English. In the French method the skins were wet back, re-egged, struck out on the table, mordanted on the table and brush dyed. The French glacé leather manufacturers have been experts at this method of dressing gloving leather for years, and no-one can surpass them in the excellency of their products dyed in this way. The English method, on the other hand, involved the use of drums, and polygonal and box drums were in use in glove leather factories before drums were in general use in ordinary leather works. The leather was wet back in a small quantity of tepid water in the drum, and then dyed with natural dyestuffs and metallic salt mordant. Some of the recipes still in use for this purpose are most complicated, involving the use of several dyewoods, such as oak bark, alder and golden tan, and also the use of different salt mordants such as bichromate, copperas, bluestone, and chrome liquor. The writer has seen all these materials and also ground ebony wood, lignum vitæ and larch bark in a glove leather works within the past year. The drumming of the leather in such dye liquors resulted in the extraction from the leather of some of the tanning materials, and it was necessary to replace these by re-egging. The leather finished on the English principle was full, velvety and thicker than that dressed by the French method. Generally it was only suitable for flesh finishes and the grain gloving at one time was mostly foreign. Later it was discovered that by chrome re-tanning the alum tawed leather, satisfactory grain gloving could be produced, although the product was not equal to the continental "Nappa" leather. The use of this chrome re-tanning method has gradually extended with the greater demand for grain gloving leather, until recently it has developed further, and the alum tawing is now being omitted on this type of leather.

## A Degreasing Process for Pickled Pelts

A considerable amount of glove leather is being produced from pickled pelts. These are degreased in a very novel way, but nevertheless it is found to be remarkably efficacious. The pickled pelts are drummed in an empty drum with one pint of paraffin for every dozen skins; more can be used if desired. The paraffin is found to remove sufficient grease to enable the leather to be tanned and dressed without trouble. Following this degreasing process, the pelts are de-pickled and chrome tanned with one-bath chrome tanning liquors of normal basicity (33 per cent.). The tanned leather is then neutralised with weak borax solutions in the usual way, washed and mordanted with bleached sumac extract. If the skins are for flesh finish it is possible to dry them out at this stage and leave them in the crust condition until they are required. It is found that they wet back quite satisfactorily. Leather for grain work must be dyed without drying out.

Chrome tanned gloving leather can be dyed with coal-tar dyestuffs; acid dyestuffs are mostly used for this purpose. The leather is pre-treated with one or two per cent. of gambier, sumac extract, liquid myrobalans extract, fustic or a dyewood extract. This tannin or dyewood mordant is applied in tepid water at 90° F. for twenty or thirty minutes, and the leather is then transferred to fresh hot water at 130° F. in a drum. The acid dyestuff solution is added in two or three lots to this dye liquor over a period of twenty minutes and then a small addition of diluted sulphuric acid (about one-half per cent.) is added to the dye liquor in the drum and the leather run with it for ten minutes. The dyed leather must now be fat liquored, *i.e.*, drummed with an emulsion of suitable oils or fats; this operation is indispensable with chrome tanned leather.

# Special Reagents for the Analytical Laboratory

## Some New Products Serving a Useful Purpose

The present article forms a continuation of one published in THE CHEMICAL AGE, May 21, 1932, and is also based on material supplied by the General Chemical and Pharmaceutical Co., Ltd., who in 1927, made available commercially in this country what are now termed "Special Reagents."

NINE "special reagents," with their uses and limits, were described in THE CHEMICAL AGE, May 21, 1932, page 459. These reagents included "Magneson" for the detection of small quantities of magnesium; "Aluminon," for aluminium; o-hydroxy-quinoline, for the determination of aluminium, zinc and magnesium; α-benzoin-monoxime, for the detection and determination of copper; α-benzil-dioxime similarly for nickel; α-nitroso-β-naphthol, for cobalt and palladium; dihydroxy-tartaric acid, for sodium; sodium 6-chlor-5-nitro-toluene-3-sulphonate, for potassium; and allyl-iodide hexamine, for cadmium.

An improved reagent for magnesium, under the name of "Magneson II" has now been introduced. This reagent is similar in nature to the original "Magneson," but has a sensitivity two and a half to three times as great and can be used for colourimetric estimation of very minute quantities of magnesium. α-Benzoin-monoxime has acquired a new significance in that it has been shown to precipitate trivalent molybdenum quantitatively from acid solution in the absence of tartaric and hydrofluoric acids; tungsten is also precipitated, but this can subsequently be estimated as its cinchonine complex and deducted from the result obtained with α-benzoin-monoxime.

### Aluminium, Magnesium and Beryllium

A further seven "Judex Special Reagents" are now available. To avoid any misunderstanding, however, it should be pointed out that The General Chemical and Pharmaceutical Co., Ltd., do not claim priority in the introduction of all these reagents; they were, however, responsible for the initial commercial manufacture in this country of this new class of special reagents in consequence of an early appreciation of their potential utility.

For the detection of, and differentiation between, small quantities of aluminium, magnesium and beryllium, 1 : 2 : 5 : 8-tetrahydroxy-anthraquinone is a useful reagent. In cases where aluminium alone is present, as little as 0.000005 mg. can be detected at a limiting dilution of two parts per hundred million of solution. Quantities as small as 1 mg. of aluminium per litre of solution can be detected in the presence of 50,000 times that concentration of magnesium. For very small amounts of the metals, filter-paper impregnated with a pyridine-acetone solution of the reagent is used; for higher concentrations, a 0.05 per cent solution in alcohol or N/10 sodium hydroxide is used. All three metals give blue precipitates in alkaline solution, differentiation being effected as follows: aluminium only gives a precipitate (red) in slightly acid solution, the beryllium lake only is stable in N/4 sodium hydroxide, and the magnesium lake is bleached by saturated bromine water.

### Detecting Small Amounts of Tin

A reagent capable of detecting small amounts of tin is of great value in many widely-differing industries. Such a reagent is nitrobruciquinone hydrate, on which strong reducing agents generally act to produce a highly-coloured reduction product; amongst the chlorides of the commoner metals, however, only stannous and titanous chlorides are sufficiently vigorous to affect it. The tin is normally concentrated in the alkali-soluble sulphide precipitate, arsenic sulphide, some sulphur and every trace of hydrogen sulphide are removed and the resulting solution reduced with pure aluminium. After filtration, on adding a few drops of reagent solution (0.25 per cent. in water) and warming, the development of a brownish-violet colour indicates the presence of tin. For the detection of the smallest amounts of tin, the reaction is carried out as a spot test on impregnated filter-paper, when as little as 0.0002 mg. of tin at a limiting dilution of 1 in 250,000 can be detected.

The recently increased interest in the properties of the less common metals, and the numerous uses which are being found for them, have led to a demand for new methods of separating and estimating them. Caesium, the least common of the alkali-metals, is one which has now acquired a position of considerable interest on account of its use in thermionic valves. Caesium iodobismuthate, or Well's salt ($Cs_3\ Bi_2\ I_9$) forms sparingly soluble, blood-red, hexagonal crystals, whilst none of the other alkali metals forms a similar complex salt. When, therefore, a saturated solution of the alkali chlorides is treated in the hot with iodobismuthic acid solution, Well's salt separates out or if present in smaller quantities, crystallises out on cooling. By standardised working, 99 per cent. of the caesium can be recovered in this way.

### Calcium in Presence of Magnesium

The osazone of sodium dihydroxy tartrate is a useful reagent for the detection and precipitation of calcium. The metals of the first four groups in ordinary group analysis should first be removed; the test for calcium is then carried out as a spot test on a microscope slide with a blank test alongside. As little as 0.00001 mg. of calcium at a limiting dilution of 1 in $5 \times 10^6$ can be detected in this way. Magnesium does not interfere unless present to the extent of ten times the amount of calcium; further, the magnesium salt is easily soluble in the hot, whereas the sensitivity of the reaction for calcium is reduced only ten times.

Salicylaldoxime is proposed as a specific reagent for copper in solutions slightly acidified with acetic acid. An opalescence is produced with as little as one part of copper per million of solution and at ten times that concentration a copious precipitate is obtained; the precipitate dried at 100-105° C. contains 18.95 per cent. of copper. The presence of relatively large amounts of zincs, nickel, cobalt, cadmium, iron silver, mercury and arsenic is immaterial provided the solution is acid.

### Mercury and Lead

Diphenyl-carbazide is a useful reagent for the detection of small amounts of mercury, cadmium or chromium; it can also be used indirectly for lead by first precipitation as chromate. For mercury, the sulphide is dissolved on a drop-plate in bromine water, excess of bromine removed with phenol and sulphuric acid, and a small drop of a 1 per cent. alcoholic solution of reagent added. If now the acidity of the drop is reduced by gradually adding potash, at a point when a very slight acidity remains an intense blue colour appears in the presence of mercury. In the case of cadmium, the drop method on impregnated filter paper is used, 0.004 mg. producing a bluish-violet colour on exposure to ammonia fumes; potassium iodide prevents the interference of copper. Chromium, oxidised to chromate, yields a violet colouration with the reagent; other strong oxidising agents give a similar reaction, but by separating according to the ordinary group-analysis this can be avoided.

The detection of lead in the presence of other heavy metals can be accomplished by the use of diphenythiocarbazone in the presence of potassium cyanide. The reagent dissolves in carbon tetrachloride or carbon disulphide to give a deep green solution; this colour is discharged by potassium cyanide, and lead, in neutral solution, produces a brick-red colour which is discharged by cobalt nitrate. Zinc is the only metal which interferes and gives a purple-red colour. The sensitivity for lead is about 0.00004 mg. at a dilution of one part in a million parts of solution.

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### Chilean Production of Calcium Carbide

ACCORDING to unofficial reports, local interests in Santiago are contemplating the manufacture of calcium carbide. In 1931, imports totalled 6,204 metric tons, of which Germany accounted for 61 per cent. Based upon preliminary experiments it is expected the product can be produced from raw materials available locally at prices competitive with the imported product.

# Recent Developments in Metallurgy

## The Phenomenon of Ageing in Metals

IN his lecture delivered on the occasion of the annual meeting of the London Section of the Society of Chemical Industry on May 1, Dr. C. H. Desch, F.R.S., head of the Metallurgical Department at the National Physical Laboratory, confined himself to the phenomena of ageing and age hardening of metals, a field in which, he pointed out, great developments have taken place during recent years and the importance of which was increasing. The phenomenon of ageing in metals was probably first observed when the alternating current transformer was first invented and put into use. The sheets used for building up the cores of these transformers were made either of wrought iron or dead soft steel and it was found that the magnetic properties deteriorated during use. At that time the subject of mechanical fatigue in metals was attracting a good deal of attention but experiments by Mordey proved that this deterioration was not due to magnetic fatigue, as it had been thought reasonable to assume. It was ascertained that during the running of the transformers the iron or steel became heated to a temperature in the neigbourhood of 60° C. and if maintained at that temperature for some time the magnetic properties deteriorated. With the advent of Hadfield's 4 per cent. silicon steel it was found that this difficulty did not exist and this material displaced soft steel for transformers. The subject of ageing was then allowed to drop for some time until it became prominent again in connection with boilers in which the deterioration of mild steel took place at a temperature above the normal, if maintained for a considerable time. Here a certain brittleness occurred and Stromeyer associated this effect with the presence of nitrogen in the steel.

### A Critical State of Dispersion

In 1911 a new alloy, duralumin, was introduced which contained about 4 per cent. of copper and 0.5 per cent. of magnesium and it was soon found that this changed its mechanical properties spontaneously in the course of time in an apparently inexplicable way which was very troublesome to deal with because it was impossible to predict what was going to happen next. It was then found out empirically that when this alloy was subjected to a certain heat treatment its mechanical properties could be varied and that practice was now invariably followed, the most suitable heat treatment being applied to give the best mechanical properties for the purpose in view. This was not explained until considerably later when three workers in the United States Bureau of Standards put forward the theory that the hardening of the alloy was due to the presence of the compound $CuAl_2$, which was undoubtedly present in the material and entered into solid solution with aluminium at a high temperature. It was suggested by these American workers that there was a certain critical state of dispersion which produced the maximum hardening effect. It was obvious, said Dr. Desch, that if this were so the same phenomenon should be observed in other alloys where similar solubility relations occurred and that, in fact, had been verified to the extent that there were now a score or two of alloy systems in which this hardening can occur. The matter, however, was not so simple as it at first appeared and a great deal of work had been done on the subject, particularly by Hanson and Gayler at the National Physical Laboratory, who found that the hardening was not due entirely to the $CuAl_2$ compound but that magnesium was always present in the alloys which showed the typical age hardening. One alloy which showed the phenomenon in a peculiarly marked degree was the copper-beryllium alloy, produced by Siemens in Germany who introduced about $2\frac{1}{2}$ or 3 per cent. of beryllium into copper to give an alloy with very high elastic properties suitable for springs. This alloy showed age hardening to a very marked degree, but the study of it had indicated the proportion to be used in order to give the desired results.

Referring to mild steel, Dr. Desch said that when age hardening occurred in duralumin and certain other alloys it was thought to be peculiar to them but work by Koster showed a close relationship between what happened to these light alloys and what happened to mild steel and the idea of Stromeyer that nitrogen played an important part in this case turned out to have a very great probability. Nitrogen was found in most mild steel in varying quantity, according to the process of manufacture, and was at a maximum in basic Bessemer or Thomas steel, the solubility relations being such as to bring about age hardening. The complete relations of nitrogen and iron had been completely worked out and the ageing of mild steel had been largely attributed to the influence of the nitrogen. Those steels which contained the least nitrogen showed the least tendency to undergo age hardening. The silicon steel which replaced soft iron for transformers contained practically no nitrogen and it did not show ageing. At the same time, the possibility of the effect of oxygen and carbon on ageing must not be ruled out. An interesting fact about age hardening was that it was greatly accelerated by cold working and that was quite in accordance with the precipitation theory. Another phenomenon connected with steel which had long been known but never explained was that most metals become weaker as the temperature increases but iron and steel gave a curve which showed a minimum at about 200° or 300° C. and then fell away to very low figures. Within a certain range above atmospheric temperature it was dangerous to apply deformation to steel. It must not be hammered at blue heat because it would engender weakness. The blue brittle range in steel corresponded closely with the range of temperature within which precipitation occurred and attempts had been made to link up the two phenomena. Dr. Desch said, however, that he doubted whether pure iron free from nitrogen, oxygen and carbon would show such phenomena and it was in all probability due to the presence of theses impurities which, at that temperature, were precipitated.

Replying to the points raised in a brief discussion, Dr. Desch said the problem of the use of steel in high pressure boilers was not one of embrittlement but of creep, which was an entirely different problem and was now being investigated at the National Physical Laboratory. He also expressed the view that mediæval steel makers did not have any secrets which we had not at the present time. The subject of weld decay was not bound up with the question of age hardening and as to airship failures it would not be right to say that these were due to insufficient knowledge of these alloys. The light alloys use in this country for this purpose had been tested thoroughly at the National Physical Laboratory by Dr. Rosenhain and must be considered standardised.

# Beilby Memorial Awards

## For Work of Exceptional Merit

FROM the interest derived from the invested capital of the Sir George Beilby Memorial Fund, at intervals to be determined by the administrators representing the Institute of Chemistry, the Society of Chemical Industry and the Institute of Metals, awards are made to British investigators in science to mark appreciation of records of distinguished original work, preference being given to investigations relating to the special interests of Sir George Beilby, including problems connected with fuel economy, chemical engineering and metallurgy. Awards are not made on the result of any competition, but in recognition of continuous work of exceptional merit, being evidence of distinct advancement in knowledge and practice.

The administrators of the fund are the presidents, the hon. treasurers, and the secretaries of the three participating institutions. Two awards of £250 each were made in 1930, and two awards of £105 each, in 1932.

The administrators will meet next month, and will be glad to have their attention directed to outstanding work of the nature indicated. Correspondence on this subject should be addressed to the Convener, Sir George Beilby Memorial Fund, The Institute of Chemistry, 30 Russell Square, London, W.C.1, not later than June 1.

# Chemical Industry Lawn Tennis Tournament

## Draw for the First Rounds

ENTRIES for the third annual Chemical Industry Lawn Tennis Tournament, arranged by THE CHEMICAL AGE, closed on Monday last, and the draw for the first rounds was completed on Tuesday. There are 34 entries—a total of 68 players—for the men's doubles, representing 23 firms in the chemical industry, and comprising 30 pairs from the London area and four from the provinces. This year, for the first time, the tournament is extended to include men's singles, and this contest has attracted a total of 44 entries, of which 37 are from the London area and seven from the provinces. Several of the competitors have entered for both the singles and doubles, the total number of players being 76, of whom 20 are new entrants.

It is of interest to record that the winners of THE CHEMICAL AGE silver challenge cup last year—S. E. Chaloner and W. Speakman, of the Monsanto Chemical Works, Ltd., Ruabon, North Wales—have entered again, as also have the 1932 runners-up—G. F. Hammond and L. Giltrow, of Williams (Hounslow), Ltd. The other semi-finalists of last year are also competing again. The small number of entries from the provinces has made it difficult to divide the country into areas, but the geographical situation of the towns represented was carefully considered in conducting the draws.

### Preliminary Matches

Full particulars of the first round draws are given below. In the case of the double, with 34 entries, preliminary contests will be necessary in two instances in order to bring the number of pairs in the first round to 32. In the case of the singles, with 44 entries, there will be a preliminary round of twelve matches. For the sake of uniformity in referring to the successive rounds and in fixing the dates within which round is to be completed, these early contests are referred to as "preliminary" rounds, and details are given of both the "preliminary" and "first" rounds. To allow sufficient time for the playing of the necessary eighteen matches (two preliminary and 16 first round) in the double and the 28 matches (12 preliminary and 16 first round) in the singles, the closing date for the receipt of the results of the first round proper has been fixed for June 13, giving an interval of close upon six weeks. It should be understood, however, that the "preliminary" matches should be completed and the results (signed by all the players in each match) forwarded to the Editor of THE CHEMICAL AGE as soon as possible, not later than Monday, May 22, in order that due notification may be given of the revised and completed draws for the first round.

Players are requested to read carefully the brief rules, copies of which have been supplied to them, and adhere to them, as failure to do so may lead to disappointment. For ready reference we reproduce below the principal rules affecting the early rounds of the tournament.

### Rules

The competition shall be conducted on the knock-out principle, and the best of three advantage sets shall be played in all matches, except in the Final of the Singles, when the best of five sets shall be played.

The Editor of THE CHEMICAL AGE shall have the right to scratch any players who fail to play off their matches by the stipulated dates, or who otherwise fail to conform with the rules and regulations governing this competition.

Except in the case of the special period set apart for the final stages of the competition, players drawn against each other must make their own arrangements for playing off their match on a court mutually agreed upon. In the event of disagreement, the first name drawn shall have the right to choose the ground.

The result of each match must be sent by the winners to the Editor of THE CHEMICAL AGE, signed by all players (winners and losers) immediately after the match, and must reach the office of THE CHEMICAL AGE not later than by the first post on the day following the final day for playing off the round. In the case of the preliminary matches, the results must be received not later than 9.30 a.m. on May 22, and in the case of the first round not later than 9.30 a.m. on Tuesday, June 13.

If any player be not present at the agreed place or time of the match, opponents shall be entitled to a walk-over, after having allowed reasonable time (say, a maximum of one hour) for the others' appearance. If the players find it impossible to play off their match on the day originally chosen, they must play it on any other day, to which both sides agree, within the stipulated period.

Any dispute arising between players, or otherwise, shall be referred to the arbitration of the Editor of THE CHEMICAL AGE, whose decision shall be final.

While competitors will make their own arrangements as to hard or grass courts for the preliminary rounds, it must be understood that the Finals will be played on hard courts.

## Singles

### Preliminary Round

MATCH 1.

**Grape, L. F.** Borax Consolidated, Ltd., 16, Eastcheap, London, E.C. (Royal 1450.) *v* **Trigg, G. H.** Bovril, Ltd., 148/166, Old Street, London, E.C.1. (Clerkenwell 1202.)

MATCH 2.

**Urban, J. W.** Monsanto Chemical Works, Ltd., Victoria Station House, London, S.W.1. (Victoria 1535.) *v* **Welsh, R. W.** British Oxygen Co., Ltd., Angel Road, Edmonton, London, N. (Tottenham 2488.)

MATCH 3.

**Keeley, E. C.** Bovril, Ltd., 148/166, Old Street, London, E.C.1. (Clerkenwell 1202.) *v* **Fradin, L. R.** Borax Consolidated, Ltd., 16, Eastcheap, London. (Royal 1450.)

MATCH 4.

**Law, R. S.** Howards & Sons, Ltd., Uphall Works, Ilford, Essex. (Ilford 1113.) *v* **Dauncey, W. J.** G. A. Harvey & Co. (London), Woolwich Road, London, S.E.1. (Greenwich 0020.)

MATCH 5.

**Backinsell, W.** Le Grand Sutcliff & Gell, Ltd., The Green, Southall, Middlesex. (Southall 2211.) *v* **Fuller, K. L.** The British Drug Houses, Ltd., 16-30, Graham Street, City Road, London. (Clerkenwell 3000.)

MATCH 6.

**Copp, C. G.** Boulton & Co., Ltd., 28, High Street, Lambeth, London, S.E.1. (Reliance 2141.) *v* **Porter, R. F.,** Howards & Sons, Ltd., Uphall Works, Ilford, Essex. (Ilford 1113.)

MATCH 7.

**Middleton, A. W.** Yardley & Co., Ltd., Carpenters Road, Stratford, London, E.15. (Maryland 2333.) *v* **Frost, R.** The British Oxygen Co., Ltd., Angel Road, Upper Edmonton, London, N.18. (Tottenham 2488.)

MATCH 8.

**Wilson, J.** British Celanese, Ltd., 22/3, Hanover Square, London, W.1. (Mayfair 8000.) *v* **Seabrook, L.** British Oxygen Co., Ltd., Angel Road, Upper Edmonton, London, N.18. (Tottenham 2488.)

MATCH 9.

**Sharman, W. J.** Williams (Hounslow), Ltd., Hounslow. (Hounslow 2929.) *v* **Jones, C. H. B.** Anglo-Persian Oil Co., Ltd., Finsbury Circus, London, E.C.2. (National 1212.)

MATCH 10.

**Cox, E.** Anglo-Persian Oil Co., Ltd., Finsbury Circus, London, E.C.2. (National 1212.) *v* **Hodgson, D. B.** George Scott & Son (London), Ltd., Bradfield Road, Silvertown, London. (Albert Dock 2026.)

MATCH 11.

**Childs, F. C.** Borax Consolidated, Ltd., 16, Eastcheap, London. (Royal 1450.) *v* **Alldis, W. L.** Brandhurst Co., Ltd., Vintry House, Queen Street Place, London, E.C.4. (Central 1411.)

MATCH 12.

**Collard, D. G.** Dussek Bros., Verney Road, Rotherhithe, London. (Bermondsey 2634.) *v* **Perridge, S. B.** Brandhurst Co., Ltd., Vintry House, Queen Street Place, London, E.C.4. (Central 1411.)

### First Round

**Chaloner, S. E.** Monsanto Chemical Works Ltd., Ruabon, North Wales. (Ruabon 3.) *v* **Tunstall, P. A.** Salt Union, Ltd., 20, Water Street, Liverpool. (Central 4370.)

**Wilkinson, J. L.** J. Crosfield & Sons, Ltd., Bank Quay Works, Warrington. (Warrington 800.) *v* **Williams, I.** Monsanto Chemical Works, Ltd., Ruabon, North Wales. (Ruabon 3.)

**Speakman, W.** Monsanto Chemical Works, Ltd., Ruabon, North Wales. (Ruabon 3.) *v* **Pennington, R. C.** J. Crosfield & Sons, Ltd., Bank Quay, Warrington. (Warrington 800.)

Winner of Match 5 *v* Winner of Match 4.

Winner of Match 7 *v* **Giltrow, L.** Williams (Hounslow), Ltd., Hounslow. (Hounslow 2929.)

Winner of Match 8 *v* **Mugridge, R. C.** Borax Consolidated, Ltd., 16, Eastcheap, London. (Royal 1450.)

**Blow, D.**
The British Drug Houses, Ltd., Graham Street, City Road, London, N.1. (Clerkenwell 3000.)

*v*

Winner of Match 10.

Winner of Match 11.

*v*

**Smith, P.**
Bakelite, Ltd., 68, Victoria Street, London, S.W.1. (Victoria 5441.)

**George, R.**
J. Crosfield & Sons, Ltd., Bank Quay, Warrington. (Warrington 800.)

*v*

**Francis, B. T.**
Bakelite, Ltd., 68, Victoria Street, London, S.W.1. (Victoria 5441.)

Winner of Match 9

*v*

Winner of Match 3.

**Nottingham, R. A.**
Le Grand Sutcliff & Gell, Ltd., The Green, Southall, Middx. (Southall 2211.)

*v*

**Collins, A.**
British Oxygen Co., Ltd., Angel Road, Edmonton, London. (Tottenham 2647.)

**Pretlove, F. G.**
George Scott & Son (London), Ltd., Bradfield Road, Silvertown, London. (Albert Dock 2026.)

*v*

Winner of Match 12.

**Thomsett, E. A.**
British Oxygen Co., Ltd., Angel Road, Edmonton, London. (Tottenham 2488.)

*v*

**Marchant, W. W.**
Doulton & Co., Ltd., High Street, Lambeth, London. (Reliance 1241.)

**Tickner, A.**
British Celanese, Ltd., 22/3, Hanover Square, London, W.1. (Mayfair 8000.)

*v*

**Whittaker, H. R.**
Williams (Hounslow), Ltd., Hounslow. (Hounslow 2929.)

**Barningham, H.**
Monsanto Chemical Works, Ltd., Victoria Station House, London, S.W.1. (Victoria 1535.)

*v*

Winner of Match 6.

Winner of Match 2

*v*

Winner of Match 1.

# Doubles

## Preliminary Round

MATCH A.

**White, F. C.,** and **White, A. W.**
Howards & Sons, Ltd., Uphall Works, Ilford, Essex. (Ilford 1113.)

*v*

**Collins, A.,** and **Sibley, H.**
British Oxygen Co., Ltd., Angel Road, Edmonton, London, N.18. (Tottenham 2647 and 2488.)

MATCH B.

**Giltrow, L.,** and **Hammond, G.**
Williams (Hounslow), Ltd., Hounslow. (Hounslow 2929.)

*v*

**Seabrook, L.,** and **Frost, R.**
British Oxygen Co., Ltd., Angel Road, Upper Edmonton, London, N.18. (Tottenham 2488.)

## First Round

**Mountney, G. E.,** & **Almond, E. G.**
Bakelite, Ltd., Redfern Road, Tyseley, Birmingham. (A.G. 1181.)

*v*

**Miller, W. B.,** and **Lord, G.**
British Celanese, Ltd., Spondon, near Derby. (Derby 2200.)

**Chaloner, S. E.,** & **Speakman, W.**
Monsanto Chemical Works, Ltd. Ruabon, North Wales. (Ruabon 3.)

*v*

**Pennington, R. C.** & **George, R.**
J. Crosfield & Sons, Ltd., Bank Quay, Warrington. (Warrington 800.)

**Welsh, R.,** and **Thomsett, E.**
British Oxygen Co., Ltd., Angel Road, Edmonton, London. (Tottenham 2488.)

*v*

**Nottingham, R. A.,** & **Pritchard, F.**
Le Grand, Sutcliff & Gell, Ltd., The Green, Southall, Middx. (Southall 2211.)

**Wilson, J.,** and **Tickner, A.**
British Celanese, Ltd., 22/3 Hanover Square, London, W.1. (Mayfair 8000.)

*v*

**Copp, C. G.** and **Marchant, W. W.**
Doulton & Co., Ltd., High Street, Lambeth, London, S.E.1. (Reliance 1241.)

**Sharman, W. J.,** & **Whittaker, H.R.**
Williams (Hounslow), Ltd., Hounslow. (Hounslow 2929.)

*v*

**Blow, D.,** and **Fuller, K. L.**
The British Drug Houses, Ltd., Graham Street, City Road, London. (Clerkenwell 3000.)

**Alldis, W. L.,** & **Perridge, S. B.**
Brandhurst Co., Ltd., Vintry House, Queen Street Place, London, E.C.4. (Central 1411.)

*v*

**Francis, B. T.,** & **Smith, P.**
Bakelite, Ltd., 68, Victoria Street, London, S.W.1. (Victoria 5441.)

**Killick, A. A.,** & **Brittain, G. A.**
B. Laporte, Ltd., Kingsway, Luton. (Luton 891.)

*v*

**Grape, L. F.,** & **Childs, F. C.**
Borax Consolidated, Ltd., 16, Eastcheap, London. (Royal 1450.)

**Vander, R. C.,** & **Mugridge, R. C.**
Borax Consolidated, Ltd., 16, Eastcheap, London. (Royal 1450.)

*v*

Winners of Match B (Preliminary Round).

**Prosser, V. J.,** John Haig & Co., Ltd., 2 Pall Mall East, London (Whitehall 1040), and **Baxter, A.,** United Yeast Co., Ltd., 238, City Road, London. (Clerkenwell 0303.)

*v*

**Smith, G. Ormiston-,** & **Smith, F.**
Riley, Harbord & Law, 16, Victoria Street, London. (Victoria 2661.)

**Keeley, E. C.,** & **Trigg, G. H.**
Bovril, Ltd., 148/166, Old Street, London. (Clerkenwell 1202.)

*v*

**Eckett, B. J.,** & **Harbour, S.**
Williams (Hounslow), Ltd., Hounslow, Middx. (Hounslow 2929.)

**Drew, H. W.,** & **Baldock, W. G.**
Williams (Hounslow), Ltd., Hounslow), Ltd., Hounslow, Middx. (Hounslow 2929.)

*v*

**King, M. B.,** & **Hornsby, R. H.**
Howards & Sons, Ltd., Uphall Works, Ilford. (Ilford 1113.)

**Clarke, A. G. R.,** & **Browne, E.C.**
G. A. Harvey & Co. (London), Ltd., Woolwich Road, London, S.E.7. (Greenwich 0020.)

*v*

Winners of Match A (Preliminary Round).

**Jones, C. H. B.,** & **Cox, Eric.**
Anglo-Persian Oil Co., Ltd., Finsbury Circus, London. (National 1212.)

*v*

**Hogg, N.,** & **Short, H.**
Riley, Harbord & Law, 16, Victoria Street, London. (Victoria 2661.)

**Porter, R. F.,** & **Law, R. S.**
Howards & Sons, Ltd., Ilford, Essex. (Ilford 1113.)

*v*

**Hodgson, D. B.,** & **Pretlove, F. G.**
George Scott & Son (London), Ltd., Bradfield Road, Silvertown, London. (Albert Dock 2026.)

**Rowlinson, H. R.,** & **Whiteman, R.**
British Drug Houses, Ltd., 16/30, Graham Street, City Road, London. (Clerkenwell 3000.)

*v*

**Urban, J. W.,** & **Barningham, H.**
Monsanto Chemical Works, Ltd., Victoria Station House, London. (Victoria 1535.)

**How, M. H.,** & **Shaw, J.**
Johnson, Matthey & Co., Ltd., 78, Hatton Garden, London, E.C.1. (Holborn 6989.)

*v*

**Haines, J.,** & **Hawley, F. G.**
Anglo-Persian Oil Co., Britannic House, Finsbury Circus, London, E.C.2. (National 1212.)

# Toughened Plate Glass

## A Demonstration of Its Characteristics

THE 10th annual general meeting of the Society of Glass Technology was held in Sheffield on April 12, when Mr. G. V. Evers (of E. J. and J. Pearson, Ltd., Stourbridge) was elected president, in succession to Mr. Edward Meigh.

At the ordinary meeting which followed, a lecture entitled "Notes on Toughened Plate Glass" was given by Mr. James Meikle, of Pilkington Bros., Ltd., St. Helens. Mr. Meikle explained how "Armourplate" was the trade name given to plate glass which had been subjected to a special toughening process, thereby endowing the glass with strength far in excess of that of the ordinary plate glass and moreover the toughened glass, when broken, shatters in small, comparatively harmless fragments. Glass made on the Continent, and having the same properties, was known as "Securit," while a safety glass used for motor vehicles was known to us as "Triplex Toughened." The method of manufacture of "Armourplate" was based upon the same principle as the making of "Rupert's Drops," that is the plate glass was heated uniformly, then suddenly chilled by cold air. For successful toughening the physical conditions of the process had to be controlled within fine limits. The process could be applied to plate within wide limits of thickness and superficial area. There were technical difficulties in toughening glass thinner than 5/32 inch, but above this there was no difficulty with glass up to 1¼ inch.

The strength of "Armourplate" in resisting bending under load was discussed and demonstrated. Pieces of ordinary plate and of "Armourplate" were supported similarly and weights applied in the centre. The resistance to breaking in the case of the "Armourplate" was from four to five times that of the ordinary plate. Further, the plate glass splinters were sharp and long while the "Armourplate" fragments were small and not sharp on the edges. In impact tests performed by dropping a steel ball on to sheets of plate and of "Armourplate" glass supported near the ends, the height from which the ball was required to drop in order to fracture ¼ in. "Armourplate" was of the order of seven times that necessary to break the ordinary plate glass. Tests had also been devised to show how "Armourplate" retained its properties. In no case did the glass deteriorate. A fatigue test consisted of twisting a piece of the glass measuring 45 in. x 10 in. through an angle of 12° in each direction, at the rate of 750 reversals per minute up to a maximum of 100,000 reversals without fracture; one piece of ordinary plate of the same size was broken with one twist of 10° and another with one twist of 8.5°.

## German Alcohol Situation

As a result of a decree which became effective on October 1, 1932, requiring an admixture of 10 per cent. alcohol in gasoline motor fuel, the Federal alcohol monopoly in Germany will reduce stocks totalling 1,600,000 hectolitres at the close of its fiscal year ended September, 1932, to 1,000,000 hectolitres in 1933. The increased consumption of alcohol due to its use as a motor fuel constituent has called attention to wood-waste alcohol, but alcohol by this process has remained as far as possible out of competition with alcohol from usual sources such as potatoes, so that potato farmers could continue to benefit by federal monopoly protection.

# Society of Chemical Industry

## Annual Meeting of the London Section

AT the annual general meeting of the London Section of the Society of Chemical Industry, held on May 1, Dr. J. J. Fox was elected chairman in succession to Dr. Monier Williams, who becomes vice-chairman. Dr. H. E. Cox was re-elected hon. secretary and the following were elected to the committee: Dr. R. Lessing, Dr. P. May and Mr. A. L. Bacharach. Cordial votes of thanks were passed to Dr. Monier Williams and Dr. Cox for their services during the past year.

After the annual business, Dr. C. H. Desch, head of the Metallurgical Department at the National Physical Laboratory, gave a lecture on "Recent Developments in Metallurgy," a report of which appears in page 412.

# Safety Glass

## New Types Developed in Germany

ATTEMPTS are being made to substitute the celluloid intermediate layer of the usual three-ply type of safety glass by materials which present some points of superiority over celluloid itself in respect of fastness to light and weathering qualities. Although cellulose acetate offers an advantage in respect of superior resistance to ultra-violet rays, a hitherto insuperable difficulty has presented itself in the defective adhesion of a cellulose acetate film to the two outer glass sheets. Greater success has attended the application of synthetic resins obtained by polymerisation of certain organic compounds (as distinct from condensation products of the bakelite of pollopas type). According to the "Chemische Fabrik," April 19, 1933, page 172, the safety glass developed in Germany under the name of Luglas contains an intermediate layer of this type. Polymerisable substances which find application in this connection include ethyl crotonate and ethyl acrylate and it is interesting to note that crotonic acid, the raw material for ethyl crotonate, is now being manufactured on a large scale in the United States.

# Ciba Trading Results for 1932

## A Decline in Gross and Net Profits

AT the general meeting of the Society of Chemical Industry in Basle (Ciba), held in Basle on April 28, a dividend of 15 per cent. was declared, being the same as for the previous year. Declines were recorded, however, both in the gross and net profits which fell from 10.0 to 9.75 million francs and 3.36 to 3.16 million francs respectively. In the course of the report for 1932, it is stated that notwithstanding the repercussions of the general economic crisis, numerous technical improvements have to some extent succeeded in offsetting the falling trend of prices. In fact, the turnover was actually maintained in respect of the high-priced special dyestuffs, most of which are manufactured by patented processes. Whereas exchange losses led to poor results in the export trade in pharmaceutical specialities, a satisfactory turnover was achieved in the department of general pharmaceutical chemicals.

Dealing with the foreign interests of the concern, unsatisfactory results are recorded in the case of the French factory at Monthey, the indigo department of which was hard hit by the troubles in China, which is by far the most important market for this commodity. A relatively satisfactory year was experienced by the Polish interest (Pabianicer A.G.). Among the foreign factories (which it should be noted are jointly owned with the Swiss I.G.) it was stated that the Clayton Aniline Co. was able to increase its production as a result of the abandonment of the gold standard by Great Britain and the year's trading closed on a satisfactory tone. The year's trading of the Chincinati Chemical Works of Norwood, Ohio, was also of a satisfactory nature notwithstanding the variable conditions in the United States textile industry. On the other hand, the Italian subsidiary, Soz. Bergamasco per l-Industria Chimica, closed the year with a loss in consequence of poor business in the dyestuffs department and sharply cut prices.

# The German Dye Trust

## A More Satisfactory Turnover

AT the annual general meeting of the I. G. Farbenindustrie (German Dye Trust) at Frankfort, on April 28, the chairman said that, owing to precautions taken during the past few months, the Trust was not hit by the fall of the dollar. Despite a certain decrease in export business, trading last year was more satisfactory than in 1931. Turnover figures, however, were not made public. The meeting agreed to the proposed dividend of 7 per cent. on a share capital of 680,000,000 marks, the same as for the previous year.

# Organic Compounds

## Leeds Meeting of the Chemical Society

A DISCUSSION on "Substitution in Organic Compounds" will be held in the Chemistry Lecture Theatre, Leeds University, under the auspices of the Chemical Society, next Friday, May 12. The president, Professor G. T. Morgan, will be in the chair. After a reception by the Vice-Chancellor of Leeds University, three papers will be read and discussed as follows: "Significance of the Reactions of Aromatic Compounds in Electronic Theories of Reactivity," by Professor C. K. Ingold; "Anomalies in the Reactivities of Side Chain Halogens," by Dr. J. W. Baker; "Substitution of Halogens in Aliphatic Ions and Molecules," by Professor H. M. Dawson.

Dinner will be served in the University refectory, after which three further papers will be presented, one by Professor R. Robinson on "Electronic Displacements and Activation in Simple and Conjugated Unsaturated Systems"; one by Professor G. M. Bennett on "Influence of Nuclear Halogens on Side Chain Reactivity," and the third by Dr. C. W. Shoppee on "Effect of Nuclear Halogens on Triad Prototropic Systems." The meeting will be attended by members of the Chemical Society, Society of Chemical Industry, Institute of Chemistry, Society of Dyers and Colourists and other allied bodies.

# Chemical Matters in Parliament

## Creosote as Fuel

IN the House of Commons on April 26, Mr. LOUIS SMITH (Sheffield, Hallam), asked the First Lord of the Admiralty in view of the large quantities of creosote available for fuel purposes for what reason the Admiralty had been unable to purchase oil of quality equal to specification and at competitive prices from the tar-distilling industry.

Captain EUAN WALLACE replied that creosote had a number of technical disadvantages, as compared with other liquid fuels, which entailed additional expenditure in storing, mixing and use. It was not, therefore, at present suitable or economical to use it as fuel in His Majesty's ships.

Mr. SMITH asked whether Captain Wallace could state what the technical disadvantages were, so that those responsible for this home production could deal with them.

Captain WALLACE said the technical disadvantages were two. One of them was that naphthalene, which was contained in this fuel, was deposited in solid masses when the temperature fell below 60° F., and that involved special arrangements for heating tank wagons and bunkers of tankers, unless the creosote was mixed with three parts of petroleum oil. The other disadvantage was the presence of anthracene which, they were advised, was dangerous to the personnel, and until the manufacturers of creosote fuel removed this component they were not prepared to use it.

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BY incorporating neodymium oxide in glass intended for motor car windscreens, it has been found that absorption takes place of that portion of artificial and natural light which produces the maximum dazzling effect upon the retina of the human eye. In contrast to other absorptive glasses on the market, neodymium glass, known in Germany under the trade name of Neophan, does not mask the natural colour of objects, in addition to showing up the illuminated objects with exceptional sharpness. This glass, according to "Chemische Fabrik, April 19, 1933, page 172, is applied to windscreens in the form of the sandwich type of non-splinterable glass.

# News from the Allied Industries

## Dyeing and Cleaning

A VERY DIFFICULT YEAR has been experienced by Achille Serre, dyers and cleaners, during 1932. According to the balance sheet trading profit has fallen from £20,621 to £2,967, and, after head office charges, there is a net loss of £29,918 (against £11,037 in the previous year), making a total debit to profit and loss of £44,286. The head office charges include £16,995 for depreciation—the auditors, however, point out that none has been provided for any loss that may be incurred on the sale of the old works at Hackney Wick—and £3,000 for debenture redemption.

## Iron and Steel

MORE ACTIVE CONDITIONS have developed in the iron and steel markets as the first disturbing effects of the American crisis have passed. Export buyers have shown more interest, and not only has there been a considerable volume of inquiry, but a fair amount of actual business has been transacted. Business in pig-iron with overseas markets has been almost negligible, but the home demand has remained steady. In the semi-finished steel market business has been quiet. The advance in Continental quotations for this description of steel, combined with the movement of the exchange, has made sales in the British market impossible. On the other hand, buying from the British producers has been principally confined to small lots for near delivery.

## Sugar

MAJOR WALTER ELLIOTT, the Minister of Agriculture, addressed the members of the British Sugar Beet Society at the annual luncheon at the Hotel Victoria, London, on April 27. Lord Yarborough, the president of the society, was in the chair. Proposing the toast of the "British Sugar Beet Industry," Major Elliott said that last year it had been found necessary to encourage the two sides (beet growing and the refining interests) to get together and form a united front, before the necessary Governmental aid could be given, as the two parties were spending an unnecessary amount from their slender resources in propaganda revealing the crimes against society perpetrated by the other side. The remarkable fact was that after the Government had brought both interests into one room and urged them to consider their common interest there had been worked out a logical scheme for co-operation which the Government had declared was their intention to carry out. Prior to the luncheon, Colonel E. Royds, chairman of the Executive Committee of the Society, presided at the annual meeting, and expressed confidence in the Government producing a satisfactory plan upon the expiration of the Subsidy Act.

## Rubber

THE COLWYN GOLD MEDAL of the Institution of the Rubber Industry has been awarded to Mr. W. H. Paull, of the Dunlop Rubber Co., Ltd., in recogniton of his many important services to the pneumatic tyre industry.

THAT BRITISH RUBBER GROWERS would give sympathetic consideration to any well-devised scheme for the restriction of output was made clear by Mr. N. C. S. Bosanquet, who presided at the annual meeting of the Rubber Growers' Association, on April 26. With regard to the future of the industry, he said that until new uses and world prosperity called for increased demand on a wide scale, there was sufficient rubber to supply not only the world demand of the moment, but productive capacity to meet twice as much rubber as the world at present required. The result of low prices had shown that the native and wild rubber had been the chief sufferers. The European producer, however, in protecting his asset was in some cases making inroads upon his capital reserves, a process which could not be continued indefinitely, but there was evidence that in following such a policy British-grown rubber would not be the first to signal exhaustion of cash reserves.

## Artificial Silks

*THE HEARING OF THE APPEAL* in connection with the action brought by British Celanese, Ltd., against Courtaulds, Ltd., has been fixed for Monday, May 8. The action was tried by Mr. Justice Clauson in the Chancery Division and lasted 35 days, judgment being given on February 13 last. His lordship held that three British Celanese patents for the evaporative or dry spinning of cellulose acetate artificial silk were invalid. Against this decision British Celanese is appealing. Sir Stafford Cripps, K.C., who appeared for Courtaulds, Ltd., said he was hopeful that the appeal would finish this term.

THE TUBIZE CHATILLON CORPORATION announces that it has reacquired by outright purchase from the New Jersey Zinc Co., Inc., all American, Canadian, English and European patents issued to James A. Singmaster pertaining to the delustering of artificial silk or rayon by use of pigments. Ownership of these patents was recently awarded to New Jersey Zinc by decision of the United States District Court, in litigation brought to establish their ownership. The patents cover the methods and the process by which the Tubize Chatillon Corporation produces delustered yarns known as Chardonize and Sancanie, as well as their very dull viscose and acetate products.

## Matches

SHAREHOLDERS of the United Match Industries, Ltd., have approved a scheme for the re-organisation of the capital structure of the company.

## Cement

AT AN EXTRAORDINARY MEETING of the Central Portland Cement Co., Ltd., held on May 1, resolutions were passed altering the articles of association and increasing the capital to £275,000 by the creation of 125,000 new 6 per cent. cumulative redeemable preference shares of £1 each. The meeting was informed that it was proposed to give notice to the debenture stock-holders to redeem the whole of the debenture stock on August 2.

## Margarine

SPEECHES AT THE MEETINGS of Unilever, Ltd., Jurgens and Van den Berghs on April 28, made it clear that the group is steadily *reaping the fruits of amalgamation and large-scale working—two* factors in industrial efficiency which were temporarily under a cloud in the early days of the depression. Precisely because amalgamation was combined with large-scale working the group has been able to close down the Fulham factory of Van den Berghs and to concentrate output of margarine at Purfleet for the South and Bromborough Port for the North. A smaller organisation *could not have faced the capital burden of closing down a* factory of the size of the Van den Bergh Fulham works.

## Mineral Oil

SERIOUS FEARS ARE FELT IN PARIS that the British embargo on Soviet goods will let loose another period of competition in the world oil markets, for the 600,000 tons of petroleum which Soviet Russia exported to Great Britain in 1932 will be diverted to other markets. Although Russia is not a member of the World Oil Conference, the present amounts of her exports were taken into consideration when the conference reached new price and quota agreements last month. The diversion of so much Russian oil into other markets faces the next oil conference, due to meet in Paris in June, with a serious problem.

AN AGREEMENT IN PRINCIPLE is understood to have been reached between the Persian Government and the Anglo-Persian Oil Co., in the dispute which led to the cancellation of the company's oil concession and the submission of the affair to the League of Nations. Although the negotiations between the Persian authorities and Sir John Cadman, chairman of the company, have been proceeding in secrecy, it is believed that the agreement provides that, instead of 16 per cent. of the profits as at present, the *Persian Government shall receive four gold shillings per ton of* oil extracted. The company undertakes to extract a minimum of 5,000,000 tons annually, assuring to Persia a minimum of £1,000,000 gold a year. It further assents to a payment of £2,000,000 in settlement of the claims of the Persian Government, plus the tax arrears claimed.

## Non-Ferrous Metals

IT IS UNDERSTOOD that the way has been cleared for agreement in the International Tin Committee on important points of the international tin restriction scheme as the result of a conference at Singapore of representatives of Malayan and Dutch East Indies tin-mining interests.

DESPITE UNFAVOURABLE CONDITIONS, the London Tin Corporation has been able to effect a fair recovery during the year ended September 30 last. A net profit for that perod of £44,050 is reported, which compares with a loss of £1,777 shown in the previous accounts. The directors do not propose to declare a dividend, however, the view being taken that the present indefinite situation and the importance of continuing to reduce existing cash liabilities make it desirable in the interests of shareholders to conserve resources. The whole of the appropriable balance, therefore, is to be carried forward.

IN COMMON WITH OTHER BASE METALS, tin has shown a substantial advance in price during the past month. At one time the quotation was less than £1 below the level at which the International Tin Pool is permitted to dispose of a part of its large holdings. Although a slight reaction followed, the final rates of £163 12s. 6d. per ton for cash and £164 per ton for three months delivery were substantially higher on the day. Since the beginning of the month prices have risen by about £12 10s. per ton. This recovery has been assisted by the depreciaton of the dollar and the inflationary measures adopted in America, but it is mainly the result of increased consumption. Consumption is now definitely in excess of production, stocks having fallen by more than 4,000 tons in the first quarter of the year. If this rate of progress is maintained stocks *will be reduced to 48,700 tons at the end of June, when the present* restriction agreement expires. As the International Pool's holdings of 21,000 tons are included in that total, the actual amount of metal available to the market will be less than 28,000 tons, representing little more than three months' supply at the current rate of consumption.

# Inventions in the Chemical Industry

## Specifications Accepted and Applications for Patents

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.

### Specifications Accepted with Dates of Application

MANUFACTURE OF FLUORINE DERIVATIVES OF HYDROCARBONS.—Kinetic Chemicals, Inc. Sept. 20, 1930. 391,168.

PRODUCTION OF MOISTURE-RESISTANCE CELLULOSE PRODUCTS.—J. Kantorowicz. Sept. 20, 1930. 391,153.

MANUFACTURE OF GRANULAR FERTILISERS.—Kali-Forschungs-Anstalt Ges., and O. Kaselitz. Sept. 11, 1931. 391,109.

CELLULOSE DERIVATIVES AND THEIR MANUFACTURE.—British Celanese, Ltd. Oct. 15, 1930. 391,171.

MANUFACTURE AND PRODUCTION OF UNSATURATED KETONES.—J. Y. Johnson (I. G. Farbenindustrie). Oct. 8, 1931. 391,113.

ACCELERATORS FOR THE VULCANISATION OF RUBBER.—A. Carpmael (I. G. Farbenindustrie). Oct. 14, 1931. 391,120.

PYROLYSIS OF GASEOUS ALIPHATIC HYDROCARBONS.—Ruhrchemie Akt.-Ges. Dec. 17, 1930. 391,206.

STABILISATION OF CHLORINATED HYDROCARBONS.—P. W. Denny and Imperial Chemical Industries, Ltd. Oct. 14, 1931. 391,156.

BURNING OF PYRITES, OR IRON SULPHIDE, AND THE PRODUCTION OF IRON OXIDE, SULPHUR, AND SULPHUR DIOXIDE.—D. Tyrer and Imperial Chemical Industries, Ltd. Oct. 15, 1931. 391,136.

FLUOSILICATES OF ALIPHATIC AND HETEROCYCLIC AMINES.—E. I. Du Pont de Nemours and Co. Oct. 16, 1930. 391,141.

STILLS AND THE LIKE AND THE OPERATION THEREOF.—W. J. Tennant (Silica Gel Corporation). Oct. 16, 1931. 391,142.

METHOD AND APPARATUS FOR DEGREASING MATERIALS.—W. H. Smith and Imperial Chemical Industries, Ltd. Oct. 17, 1931. 391,147.

PROCESS FOR THE MANUFACTURE OF PIGMENTS.—S. R. Sheppard. Oct. 17, 1931. 391,148.

LIGHT PRODUCING IGNITABLE COMPOSITIONS.—Imperial Chemical Industries, Ltd., and S. H. Lucas. Oct. 21, 1931. 391,195.

IMPREGNATED MATERIALS FOR USE IN EXPLOSIVES, AND PROCESSES FOR IMPREGNATING SAID MATERIALS.—Imperial Chemical Industries, Ltd. (Hercules Powder Co.). Oct. 21, 1931. 391,196.

PRODUCTION OF ANTHRAQUINONE DERIVATIVES.—Imperial Chemical Industries, Ltd., R. F. Thomson, and R. J. Loveluck. Oct. 22, 1931. 391,209.

PRODUCTION OF ANHYDROUS ETHYL ALCOHOL.—Deutsche Gold- und Silerr-Scheideanstalt vorm. Roessler. June 19, 1931. 391,213.

DELUSTRING OF ARTIFICIAL SILK.—Imperial Chemical Industries, Ltd., C. Dunbar and L. G. Lawrie. Oct. 22, 1931. 391,214.

PROCESS FOR THE MANUFACTURE OF DYESTUFF INTERMEDIATES AND DYESTUFFS.—Imperial Chemical Industries, Ltd., F. W. Linch, and H. A. Piggott. Oct. 22, 1931. 391,215.

ABSORBER SYSTEMS.—Silica Gel Corporation. Nov. 18, 1930. 391,221.

PROCESS FOR THE MANUFACTURE OF AMMONIUM SULPHATE AND IRON COMPOUNDS.—W. J. Tennant (Titan Co. Aktieselskabet). Oct. 24, 1931. 391,228.

PROCESS AND APPARATUS FOR CRACKING AND TREATING HYDROCARBONS.—M. B. Schuster. Nov. 13, 1931. 391,238.

MANUFACTURE AND PRODUCTION OF FAST DYEINGS.—J. Y. Johnson (I. G. Farbenindustrie). Dec. 14, 1931. 391,252.

MANUFACTURE OF ACID WOOL DYESTUFFS.—W. W. Groves. Jan. 14, 1931. 391,262.

IMPROVING THE CAPACITY OF SODIUM NITRATE FOR BEING STORED AND SCATTERED.—J. Y. Johnson (I. G. Farbenindustrie). Feb. 13, 1932. 391,276.

REFINING OF HYDROCARBONS PRODUCED BY DESTRUCTIVE HYDROGENATION.—J. Y. Johnson (I. G. Farbenindustrie). Feb. 19, 1932. 391,283.

REFINING OF LIQUID HYDROCARBONS BY MEANS OF LIQUID SULPHUR DIOXIDE.—Edeleanu Ges. May 1, 1931. 391,308.

TREATMENT OF CRUDE PHOSPHATES.—Norsk Hydro-Elektrisk Kvaelstofaktieselskab. Aug. 29, 1931. 391,345.

MANUFACTURE OF ARTIFICIAL RESIN.—L. D'Antal. Oct. 3, 1931. 391,364.

PRODUCTION OF DETERGENTS CONTAINING ALKALI SILICATES.—I. G. Farbenindustrie. Jan. 20, 1932. 391,407.

### Applications for Patents

MANUFACTURE OF AZO DYESTUFFS.—J. Y. Johnson (I. G. Farbenindustrie). April 13. 11086.

POLYMERISATION OF ORGANIC COMPOUNDS.—J. Wilson. April 12. (March 2.) 10982, 10983, 10984, 10985.

ALUMINIUM SALTS.—Zschimmer and Schwarz Chemische Fabrik Dölau, E. Zschimmer, F. Zschimmer, M. Schwarz, R. Schwartz, and W. Schwartz. April 13. (Germany, April 18, '32.) 11170, 11171.

RECOVERY OF TIN FROM ORES.—British American Mines, Ltd. April 20. 11615.

SULPHONATION PRODUCT.—Chemische Fabrik Stockhausen et Cie. April 19. (Germany, April 19, '32.) 11510. (Germany, April 25, '32). 11511, (cognate with 11510).

CARRYING OUT CHEMICAL REACTIONS.—British Celanese, Ltd. April 18. (United States, April 16, '32.) 11298.

PRODUCTION OF AROMATIC COMPOUNDS.—British Celanese, Ltd. April 18. (United States, April 16, '32.) 11299.

MANUFACTURE OF PLASTIC COMPOSITIONS.—British Celanese, Ltd. April 18. (United States, April 16, '32.) 11300.

CELLULOSIC COMPOSITIONS.—British Celanese, Ltd. April 18. (United States, April 16, '32.) 11301.

SYNTHETIC RESINS, ETC.—British Celanese, Ltd. April 18. (United States, April 16, '32.) 11302.

MANUFACTURE OF ORGANIC COMPOUNDS.—British Celanese, Ltd. April 18. (United States, April 16, '32.) 11303.

NAPHTHALENE DERIVATIVES.—E. Chapman and Imperial Chemical Industries, Ltd. April 20. 11619.

PRODUCTION OF FLUORINE.—E. I. Du Pont de Nemours and Co. April 22. (United States, Oct. 31, '32.) 11842.

CHROMATES AND PROTECTIVES.—W. V. Gilbert. April 18. 11216.

MANUFACTURE OF CARBURETTED WATER GAS.—A. R. Griggs. April 20. 11573.

DISPERSION OF SYNTHETIC RESINS IN LIQUIDS.—H. W. Hutton. April 19. 11499.

MANUFACTURE OF RUBBER DERIVATIVES.—I. G. Farbenindustrie. April 18. 11360, 11361, 11362.

MANUFACTURE OF EMULSIFYING, WETTING, ETC., AGENTS.—I. G. Farbenindustrie. April 20. 11568, 11569.

COMPOSITIONS COMPRISING CHLORINATED ORGANIC SUBSTANCES.—I. G. Farbenindustrie and Swift and Co. April 21. (Germany, April 22, '32.) 11730.

FINISHES.—Imperial Chemical Industries, Ltd. April 20. 11618.

MANUFACTURE OF SOLS, ETC.—J. Y. Johnson (I. G. Farbenindustrie). April 18. 11317.

PROCESS FOR IMPROVING OILS.—J. Y. Johnson (I. G. Farbenindustrie. April 18. 11318.

MANUFACTURE OF COMPLEX METAL COMPOUNDS OF ORTHO-HYDROXYAZO DYESTUFFS.—J. Y. Johnson (I. G. Farbenindustrie). April 20. 11596.

CLOSURES FOR EFFECTING HERMETIC SEALS FOR CONTAINERS.—Mallinckrodt Chemical Works. April 21. (United States, April 8.) 11718.

APPARATUS FOR PRODUCTION OF ELECTRIC RADIATION AND OZONE.—J. R. Quain. April 19. 11441.

PREPARATION OF ARTIFICIAL MASSES FROM VINYLIC DERIVATIVES, ETC.—Soc. Nobel Française. April 19. 11476, 11477, 11478.

ANODIC COATING OF ALUMINIUM.—Aluminium Colors, Inc. April 24. (United States, July 26, '32.) 11964.

COATING ALUMINIUM, ETC.—Aluminium Colors, Inc. April 24. (United States, May 27, '32.) 11965.

MANUFACTURE OF PARA DIKETOCAMPHAN CARBOXYLIC ACID, ETC.—Y. Asahina, M. Ishidate, G. Kilhara and K. Tamura. April 27. 12337.

LAMINATED GLASS, ETC.—M. P. Benton. April 25. 12073.

OBTAINING PURE METALLIC COBALT IN POWDER.—British Thomson-Houston Co., Ltd. April 27. (France, April 29, '32.) 12298.

MOISTURE-PROOF MATERIALS, ETC.—Carbide and Carbon Chemicals Corporation. April 24. (United States, May 24, '32.) 11961

MOISTURE-PROOF MATERIALS, ETC.—Carbide and Carbon Chemicals Corporation. April 24. (United States, May 24, '32.) 11962.

RETORTS FOR LOW-TEMPERATURE DISTILLATION OF CARBONACEOUS MATERIAL.—Carlton Main Colliery Co., Ltd. and S. Gill. April 24. 11953.

MANUFACTURE OF METAL-ORGANIC COMPLEX COMPOUNDS.—A. Carpmael (I. G. Farbenindustrie). April 27. (Jan. 7, '32.) 12336.

METHOD FOR INHIBITING OXIDATION OF METALS.—Dow Chemical Co. April 27. (United States, June 17, '32.) 12304.

HYDRATION OF OLEFINES.—H. Dreyfus. April 24. (Dec. 22, '31.) 11987, 11988.

MANUFACTURE OF AZO DYESTUFFS.—E. I. Du Pont de Nemours and Co., A. R. Murphy and I. Gublemann. April 25. 12077, 12078.

MANUFACTURE OF SULPHUR DYESTUFFS.—E. I. Du Pont de Nemours and Co. April 27. (United States, April 27, '32.) 12308.

MANUFACTURE OF SULPHUR DYESTUFFS.—E. I. Du Pont de Nemours and Co. April 27. (United States, May 4, '32.) 12309.

CENTRIFUGAL TREATMENT OF LIQUIDS.—A. W. Empson. April 26. 12179.

PROCESS OF PRODUCING WHITE ALKALI METAL CYANIDS.—Grangers Manufacturing Co. April 24. (United States, May 7, '32.) 11963.

# Weekly Prices of British Chemical Products

## Review of Current Market Conditions

THE following market report is based on information supplied by the British manufacturers concerned, and unless otherwise qualified the figures quoted apply to fair quantities, net and naked at makers' works. Where no locality is indicated, the prices are general for the United Kingdom. Particulars of the London chemical market are specially supplied to THE CHEMICAL AGE by R. W. Greeff and Co., Ltd., and Chas. Page and Co., Ltd., and those of the Scottish chemical market by Chas. Tennant and Co., Ltd.

THE demand for chemicals generally in the London market is improving, with practically all prices very firm. In the coal tar products market there is an improved inquiry for benzol and cresylic acid, but business is still restricted. In one or two instances values on the Manchester market are a shade easier on balance for the week, but, for the most part, chemical prices continue distinctly steady in tendency. There has, however, been no marked improvement in the volume of business and whilst deliveries keep up fairly well there has been no wider disposition among users to buy far forward. The majority of sellers during the past week report individual transactions to be of limited extent. Business has been slightly better during the past week in the Scottish heavy chemical market. No important change in prices has to be reported.

### 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.—SCOTLAND: Granulated commercial, £26 10s. per ton; B.P. crystals, £35 10s.; B.P. powder, £36 10s. in 1-cwt. bags d/d free Great Britain in 1-ton lots upwards.

ACID, CHROMIC.—11d. per lb., less 2½%, d/d U.K.

ACID, CITRIC.—LONDON: 9¼d. per lb.; less 5%. MANCHESTER: 9¼d. to 9⅜d.

ACID, CRESYLIC.—97/99% 1s. 3d. to 1s. 7d. per gal.; 99/100%, 1s. 7d. to 2s.

ACID, FORMIC.—LONDON: £50 per ton.

ACID, HYDROCHLORIC.—Spot, 3s. 9d. 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, £45; pale tech., 50% by vol., £28; 50% by weight, £33; 80% by weight, £53; edible, 50% by vol., £41. One-ton lots ex works, barrels free.

ACID, NITRIC.—80° Tw. spot, £18 to £25 per ton makers' works, according to district and quality. SCOTLAND: 80°, £23 ex station full truck loads.

ACID, OXALIC.—LONDON: £47 7s. 6d. to £57 10s. per ton, according to packages and position. SCOTLAND: 98/100%, £49 to £52 ex store. MANCHESTER: £48 to £50 ex store.

ACID, SULPHURIC.—Average prices f.o.r. British makers' works, with slight variations owing to local considerations; 140° Tw. crude acid, £3 per ton; 168° Tw. arsenical £5 10s.; 168° Tw. non-arsenical, £6 15s. SCOTLAND: 144° quality, £3 12s. 6d.; 168°, £7; dearsenicated, 20s. per ton extra.

ACID, TARTARIC.—11d. per lb. SCOTLAND: B.P. crystals, 10¾d., carriage paid. MANCHESTER: 11¼d.

ALUM.—SCOTLAND: Lump potash, £9 per ton ex store.

ALUMINA SULPHATE.—LONDON: £8 5s. to £9 10s. per ton. SCOTLAND: £8 to £8 10s. ex store.

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

AMMONIA LIQUID.—SCOTLAND: 80°, 2¼d. to 3d. per lb., d/d.

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

AMMONIUM CARBONATE.—SCOTLAND: Lump, £32 per ton; powdered, £34, in 5-cwt. casks d/d buyers' premises U.K.

AMMONIUM CHLORIDE.—£37 to £45 per ton, carriage paid. LONDON: Fine white crystals, £19 to £20. (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, £24 per ton, c.i.f. U.K. ports.

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

ARSENIC.—LONDON: £19 c.i.f. main U.K. ports for imported material; Cornish nominal, £23 f.o.r. mines. SCOTLAND: White powdered, £25 ex wharf. MANCHESTER: White powdered Cornish, £23 at mines.

ARSENIC SULPHIDE.—Yellow, 1s. 6d. to 1s. 8d. per lb.

BARIUM CHLORIDE.—£11 per ton.

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

BLEACHING POWDER.—Spot 35/37% £7 19s. per ton d/d station in casks, special terms for contract. SCOTLAND: £8 15s. in 5/6 cwt. casks.

BORAX, COMMERCIAL.—Granulated, £15 10s. per ton; powder, £17 packed in 1-cwt. bags, carriage paid any station Great Britain. Prices are for 1-ton lots and upwards.

CADMIUM SULPHIDE.—3s. 1d. to 3s. 5d. 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 5½d. per lb., ex wharf.

CARBON TETRACHLORIDE.—£41 to £46 per ton, drums extra.

CHROMIUM OXIDE.—10d. to 10½d. per lb., according to quantity d/d U.K. Green, 1s. 2d. per lb.

CHROMETAN.—Crystals, 3¾d. per lb. Liquor, £19 10s. per ton d/d.

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

CREAM OF TARTAR.—LONDON: £4 per cwt.

DIPHENYLGUANIDINE.—2s. 2d. per lb.

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

LAMPBLACK.—£46 to £50 per ton.

LEAD ACETATE.—LONDON: White, £34 per ton; brown, £1 per ton less. SCOTLAND: White crystals, £34 to £36; brown, £1 per ton less. MANCHESTER: White, £31 10s.; brown, £30.

LEAD NITRATE.—£28 per ton.

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

LEAD, WHITE.—SCOTLAND: £40 per ton, carriage paid.

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

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

METHYLATED SPIRIT.—61 O.P. Industrial 1s. 8d. to 2s. 3d. per gal. Pyridinised Industrial, 1s. 10d. to 2s. 5d. Mineralised, 2s. 9d. to 3s. 3d. 64 O.P. 1d. extra in all cases. Prices according to quantities. SCOTLAND: Industrial 64 O.P., 1s. 9d. to 2s. 4d.

NICKEL AMMONIUM SULPHATE.—£52 per ton d/d.

NICKEL SULPHATE.—£52 per ton d/d.

PHENOL.—9d. to 10d. per lb. nominal.

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

POTASSIUM BICHROMATE.—Crystals and Granular, 5d. per lb. net d/d U.K. Discount according to quantity. Ground 5¾d. LONDON: 5d. per lb. with usual discounts for contracts. SCOTLAND: 5d. d/d U.K. or c.i.f. Irish Ports. MANCHESTER: 5d.

POTASSIUM CHLORATE.—3¾d. per lb. ex wharf London in 1-cwt kegs. LONDON: £37 to £40 per ton. SCOTLAND: 99¾/100% powder, £37. MANCHESTER: £38.

POTASSIUM CHROMATE.—6¼d. per lb. d/d U.K.

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

POTASSIUM PERMANGANATE.—LONDON: 8¼d. per lb. SCOTLAND: B.P. crystals, 9d. MANCHESTER: Commercial, 8¼d. B.P., 8¾d.

POTASSIUM PRUSSIATE.—LONDON: 8¼d. to 9d. per lb. SCOTLAND: Yellow spot material, 8¼d. ex store. MANCHESTER: Yellow, 8¼d.

SALAMMONIAC.—First lump spot, £42 17s. 6d. per ton d/d in barrels.

SODA ASH.—58% spot, £5 17s. 6d. per ton f.o.r. in bags, special terms for contracts.

SODA, CAUSTIC.—Solid 76/77° spot, £14 5s. per ton d/d station. SCOTLAND: Powdered 98/99%, £17 10s. in drums, £18 15s. in casks, Solid 76/77%, £14 10s. in drums; 70/73%, £14 12s. 6d., carriage paid buyer's station, minimum 4-ton lots; contracts 10s. per ton less. MANCHESTER: £13 5s. to £14 10s. contracts.

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

SODIUM ACETATE.—£22 per ton. LONDON: £23 to £24.

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

SODIUM BICHROMATE.—Crystals cake and powder 4d. per lb. net d/d U.K. discount according to quantity. Anhydrous, 5d. per lb. LONDON: 4d. per lb. with discounts for quantities. SCOTLAND: 4d. delivered buyer's premises with concession for contracts. MANCHESTER: 4d. less 1 to 3½% contracts, 4d. spot lots.

SODIUM BISULPHITE POWDER.—60/62%, £16 10s. per ton d/d 1-cwt. iron drums for home trade.

SODIUM CARBONATE (SODA CRYSTALS).—SCOTLAND: £5 to £5 5s. per ton ex quay or station. Powdered or pea quality 7s. 6d. per ton extra. Light Soda Ash £7 ex quay, min. 4-ton lots with reductions for contracts.

SODIUM CHLORATE.—£32 per ton.
SODIUM CHROMATE.—3⅜d. per lb. d/d U.K.
SODIUM HYPOSULPHITE.—SCOTLAND: Large crystals English manufacture, £9 5s. per ton ex stations, min. 4-ton lots. Pea crystals, £15 ex station, 4-ton lots. MANCHESTER: Commercial, £9 5s.; photographic, £15.
SODIUM NITRITE.—Spot, £19 to £22 per ton d/d station in drums.
SODIUM PERBORATE.—LONDON: 10d. per lb.
SODIUM PHOSPHATE.—£12 10s. per ton.
SODIUM PRUSSIATE.—LONDON: 5d. to 5½d. per lb. SCOTLAND: 5d. to 5⅔d. ex store. MANCHESTER: 4⅔d. to 5⅔d.
SODIUM SILICATE.—140° Tw. Spot £8 5s. per ton d/d station, returnable drums.
SODIUM SULPHATE (GLAUBER SALTS).—£4 2s. 6d. per ton d/d. SCOTLAND: English material £3 15s.
SODIUM SULPHATE (SALT CAKE).—Unground Spot, £3 15s. per ton d/d station in bulk. SCOTLAND: Ground quality, £3 5s. per ton d/d. MANCHESTER: £3 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 2s. 6d. d/d buyer's works on contract, min. 4-ton lots. Spot solid 5s. per ton extra. Crystals, 2s. 6d. per ton extra. MANCHESTER: Concentrated solid, 60/62%, £11; commercial, £8.
SODIUM SULPHITE.—Pea crystals spot, £13 10s. per ton d/d station in kegs. Commercial spot, £9 10s. d/d station in bags.
SULPHATE OF COPPER.—MANCHESTER: £15 per ton f.o.b.
SULPHUR.—£11 15s. per ton. SCOTLAND: Flowers, £11; roll, £10 10s.; rock, £9; ground American, £10 ex store.
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. 9d. per lb.
ZINC CHLORIDE.—SCOTLAND: British material, 98%, £18 10s. per ton f.o.b. U.K. ports.
ZINC SULPHATE.—LONDON AND SCOTLAND: £12 per ton.
ZINC SULPHIDE.—1s. to 1s. 1d. per lb.

## Pharmaceutical and Fine Chemicals

ACID, TARTARIC.—11½d. per lb.
MENTHOL.—A.B.R. recryst. B.P., 15s. per lb.; synthetic detached crystals, 8s. 6d. to 10s. 6d. per lb.
PHENACETIN.—4s. 3d. to 4s. 9d. per lb.
POTASS. BITARTRATE. 99/100% (cream of tartar).—80s. per cwt.
SAFROL.—1s. 6d. per lb.
SODIUM POTASSIUM TARTRATE (Rochelle Salt).—70s. per cwt.
TARTAR EMETIC B.P.—3s. 9d. to 4s. 6d. per lb.

## Essential Oils

BERGAMOT.—6s. 6d. per lb.
CITRONELLA, JAVA.—2s. 9d. per lb.
LAVENDER, MONT BLANC, 38/40%.—10s. per lb.
LEMONGRASS.—3s. per lb.

## Intermediates and Dyes

IN the following list of intermediates delivered prices include packages except where otherwise stated:—
ACID, BENZOIC, 1914 B.P. (ex Toluol).—1s. 9½d. per lb.
ACID, GAMMA.—Spot, 4s. per lb. 100% d/d buyer's works.
ACID, H.—Spot, 2s. 4½d. per lb. 100% d/d buyer's works.
ACID, NEVILLE AND WINTHER.—Spot, 3s. per lb. 100% d/d buyer's works.
ACID, SULPHANILIC.—Spot, 8d. per lb. 100% d/d buyer's works.
ANILINE OIL.—Spot, 8d. per lb., drums extra, d/d buyer's works.
ANILINE SALTS.—Spot, 8d. per lb. d/d buyer's works, casks free.
BENZALDEHYDE.—Spot, 1s. 8d. per lb., packages extra.
BENZIDINE BASE.—Spot, 2s. 5d. per lb. 100% d/d buyer's works.
*p*-CRESOL 34-5° C.—1s. 9d. per lb. in ton lots.
*m*-CRESOL 98/100%.—2s. 3d. per lb. in ton lots.
DICHLORANILINE.—2s. 3d. per lb.
DIMETHYLANILINE.—Spot, 1s. 6d. per lb., package extra.
DINITROBENZENE.—8d. per lb.
DINITROTOLUENE.—48/50° C., 8d. per lb.; 66/68° C. 8⅔d. per lb.
DIPHENYLAMINE.—Spot, 2s. per lb., d/d buyer's works.
α-NAPHTHOL.—Spot, 2s. 4d. per lb., d/d buyer's works.
β-NAPHTHOL.—Spot, £78 15s. per ton in paper bags; £79 15s. in casks, in 1-ton lots.
α-NAPHTHYLAMINE.—Spot, 11½d. per lb., d/d buyer's works.
β-NAPHTHYLAMINE.—Spot, 2s. 9d. per lb. d/d buyer's works.
*o*-NITRANILINE.—5s. 10d. per lb.
*m*-NITRANILINE.—Spot, 2s. 7d. per lb. d/d buyer's works.
*p*-NITRANILINE.—Spot, 1s. 8d. per lb. d/d buyer's works.
NITROBENZENE.—Spot, 4½d. per lb.; 5-cwt. lots, drums extra.
NITRONAPHTHALENE.—9d. per lb.
SODIUM NAPHTHIONATE.—Spot, 1s. 9d. per lb.
*o*-TOLUIDINE.—Spot, 9½d. per lb., drums extra, d/d buyer's works.
*p*-TOLUIDINE.—Spot, 1s. 11d. per lb., d/d buyer's works.
*m*-XYLIDINE ACETATE.—3s. 4d. per lb.

## Coal Tar Products

ACID, CARBOLIC.—Crystals, 9d. to 10d. per lb.; crude, 60's, 1s. 11d. to 2s. per gal.; 2% water, 3s. 0¾d. MANCHESTER: Crystals, 9¼d. per lb.; crude, 2s. 6d. per gal. SCOTLAND: 60's, 1s. 7d. to 1s. 8d.
ACID, CRESYLIC.—99/100%, 11d. to 1s. 8d. per gal.; pale 95%, 11d. to 11½d.; dark, 10d., all according to specification; refined, 1s. 7d. to 1s. 8d. LONDON: 98/100%, 1s. 3d.; dark, 95/97%, 11d. SCOTLAND: Pale 99/100%, 1s. 3d. to 1s. 4d.; 97/99%, 1s. to 1s. 1d.; dark 97/99%, 11d. to 1s.; high boiling acid, 2s. 6d. to 3s.
ANTHRACENE OIL.—Strained, 4½d. per gal.
BENZOL.—At works, crude, 10d. to 11d. per gal.; standard motor, 1s. 6½d. to 1s. 7d.; 90%, 1s. 7d. to 1s. 8d.; pure, 1s. 10d. to 1s. 11d. LONDON: Motor, 1s. 7½d. SCOTLAND: Motor, 1s. 6½d. to 1s. 7½d.; 90%, 2s. 0½d. to 2s. 1½d.
CREOSOTE.—B.S.I. Specification standard, 2½d. per gal. f.o.r. Home, 3⅜d. d/d. LONDON: 3d. to 3½d. f.o.r. North; 4d. to 4½d. London. MANCHESTER: 2½d. to 3½d. SCOTLAND: Specification oils, 3⅜d. to 4¼d.; washed oil, 4d. to 4½d.; light, 3¾d. to 4¼d.; heavy, 4¼d. to 5d.
NAPHTHA.—Solvent 90/160%, 9d. to 1s. 2d. per gal.; 95/160%, 1s. 7d. to 1s. 8d.; 90/160%, 1s. 1d. to 1s. 2d. LONDON: Solvent, 1s. 3½d. to 1s. 4d.; heavy, 11d. to 1s. 0½d. f.o.r. SCOTLAND: 90/160%, 1s. 3d. to 1s. 3½d.; 90/190%, 11d. to 1s. 2d.
NAPHTHALENE.—Crude, Hot-Pressed, £6 1s. 3d. per ton. Flaker, £10 per ton. Purified crystals, £9 10s. 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, 65s. to 70s.
PITCH.—Medium soft, £4 5s. to £4 10s. per ton. MANCHESTER: £4 to £4 7s. 6d. f.o.b. LONDON: £4 to £4 2s. 6d. f.o.b. East Coast port.
PYRIDINE.—90/140, 3s. 9d. per gal.; 90/160, 4s. to 4s. 6d.; 90/180, 2s. to 2s. 6d. SCOTLAND: 90/160% 4s. to 5s.; 90/220%, 3s. to 4s.
TOLUOL.—90%, 2d. per gal.

## Wood Distillation Products

ACETATE OF LIME.—Brown, £8 10s. to £8 15s. per ton. Grey £13 to £14. Liquor, brown, 30° Tw., 6d. per gal. MANCHESTER: Brown, £9 10s.; grey, £13.
ACETIC ACID, TECHNICAL, 40%.—£17 to £18 per ton.
AMYL ACETATE, TECHNICAL.—95s. to 110s. per cwt.
CHARCOAL.—£6 to £11 per ton.
WOOD CREOSOTE.—6d. to 2s. per gal., unrefined.
WOOD NAPHTHA, MISCIBLE.—2s. 7d. to 4s. per gal. Solvent, 3s. 9d. to 4s. 9d. per gal.
WOOD TAR,—£2 to £6 per ton.
REFINED COAL TAR.—SCOTLAND: 4⅔d. to 5d. per gal.
XYLOL.—Common, 1s. 11d. to 2s. per gal.; pure, 2s. to 2s. 2d.
TOLUOL.—90%, 1s. 11d. to 2s. per gal.; pure, 2s. 3d.

## Nitrogen Fertilisers

SULPHATE OF AMMONIA.—Export, £6 per ton f.o.b. U.K. ports in single bags; home, £6 10s. per ton, delivered in 6-ton lots to consumer's nearest station.
NITRATE OF SODA.—£8 16s. per ton, delivered in 6-ton lots to consumer's nearest station.
CYANAMIDE.—£7 per ton, delivered in 6-ton lots to consumer's nearest station.
NITRO-CHALK.—£7 5s. per ton, delivered in 6-ton lots to consumer's nearest station.
CONCENTRATED COMPLETE FERTILISERS.—£10 9s. 6d. to £11 per ton according to percentage of constituents.

## Latest Oil Prices

LONDON, May 3.—LINSEED OIL closed steadier. Spot, small quantities, £20; May, £17; June-Aug., £17 7s. 6d.; Sept.-Dec., £17 17s. 6d. per ton, naked. RAPE OIL was quiet. Crude extracted, £28; technical refined, £29 10s. per ton, naked, ex wharf. COTTON OIL was steady. Egyptian crude, £19; refined common edible, £21; and deodorised, £23 per ton, naked, ex mill. TURPENTINE was firm. American, spot, 61s. 6d. per cwt.

HULL.—LINSEED OIL, spot, quoted £17 10s. per ton; May, £17; May-Aug., £17 5s.; Sept.-Dec., £17 17s. 6d. COTTON OIL, Egyptian, crude, spot, £18 10s.; edible, refined, spot, £20 15s.; technical, spot, £20 15s.; deodorised, £22 15s., naked. PALM KERNEL OIL, crude, f.m.q., spot, £19, naked. GROUNDNUT OIL, extracted, spot, £23; deodorised, £27. RAPE OIL, extracted, £26 10s.; refined, £28. SOYA OIL, extracted, spot, £19; deodorised, £22 per ton. COD OIL, May, 17s. per cwt. CASTOR OIL, pharmaceutical, spot, 38s.; first, 33s.; second, 30s. per cwt. TURPENTINE, American, spot, 63s. per cwt.

# 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).**

**South Africa.**—A Durban firm of manufacturers' agents desires to secure representation throughout South Africa of United Kingdom manufacturers of edible oils, preferably on a commission basis. (Ref. No. 623.)

**South Africa.**—A Durban firm of wholesale chemists and druggists desires to secure the representation, on a basis to be arranged, of United Kingdom manufacturers of chemists' sundries and laboratory ware, for the Province of Natal (and East Griqualand). (Ref. No. 625.)

**Austria.**—An agent established at Vienna wishes to obtain the representation, on a commission basis, of United Kingdom manufacturers of fertilisers. (Ref. No. 628.)

**Czechoslovakia.**—A commission agent established at Prague wishes to obtain the representation of United Kingdom suppliers of tanning materials (including quebracho extract), indigo, bromide, raw iodine, casein, essential oils, castor oil, soya bean oil, raw camphor, on a commission basis. (Ref. No. 631.)

**Canada.**—A firm of manufacturers' agents in Montreal is desirous of obtaining a United Kingdom source of supply of forged chromium steel valves and pipe fittings for chemical works, paper mills, etc. They are understood to work on a commission basis and cover the whole of the Dominion. (Ref. No. 611.)

**Canada.**—A firm of manufacturers' agents at Montreal is prepared to represent United Kingdom manufacturers of industrial chemicals for paper and textile mills, including sodium di-phosphate, sodium bi-sulphate, etc., presumably on a commission basis, throughout the Dominion. (Ref. No. 619.)

**Canada.**—A firm of manufacturers' agents for general engineering supplies and specialising in municipalities' requirements is desirous of obtaining agencies for United Kingdom manufacturers of (a) sulphate of alumina, calcium chloride and copper sulphate; (b) water filtration equipment, including softeners, (c) water-works specialities, such as valves, hydrants, meters, etc.; (d) refrigeration machinery. The firm work on a commission basis and cover the Provinces of Saskatchewan, Manitoba and Alberta. (Ref. No. 620.)

**Poland.**—A reputable firm in Warsaw wishes to represent United Kingdom manufacturers of drugs and pharmaceutical chemicals. (Ref. No. 634.)

**Argentina.**—The Commercial Counsellor to H.M. Embassy at Buenos Aires reports that the Argentina State Oilfields are calling for tenders, to be presented in Buenos Aires by May 19, 1933, for the supply of 9,000 litres of vegetable turpentine (distilled from pine or larch.) (Ref. B.X. 7554.)

# Company News

**Broken Hill South, Ltd.**—The directors have declared a dividend of 5 per cent., payable in Melbourne on June 23.

**Wall Paper Manufacturers, Ltd.**—An interim dividend of 5 per cent. has been declared on the ordinary stock, and an interim of 4 per cent. on the deferred stock in respect of the current year.

**Celanese Corporation of America.**—The directors have declared a dividend of $1.25 per share on the 7 per cent. cumulative series prior deferred stock, payable on May 19.

**British Oxygen Co., Ltd.**—A final ordinary dividend of 3 per cent., making 5 per cent., and a bonus of 1½ per cent., less tax, is recommended for the year 1932. For the year 1931 the total distribution was 3 per cent.

**Trinidad Leaseholds, Ltd.**—The board announces an interim dividend of 5 per cent., less Trinidad tax and subject to U.K. tax, the net amount being 9.187d. per share. The dividend which is at the same rate as last year, will be payable on May 17.

**Park Gate Iron & Steel Co., Ltd.**—The directors recommend the payment of a dividend of 1 per cent., less tax, for the year ended March 31 last. The previous dividend was paid eleven years ago, when 7½ per cent. was distributed for 1921-22.

**Achille Serre, Ltd.**—The annual meeting will be held at Blackhorse Lane, London, on May 10, at 12 noon. There was a net loss for the year 1932 of £29,918, against a loss of £11,037 in the previous year. To this is added the balance brought in, £14,368, leaving a debit balance to be carried forward of £44,286.

**J. Mandleberg & Co., Ltd.**—A trading loss of £26,640 is reported for the year 1932, which compares with a net profit of £2,442 in the previous year. The amount brought in was £17,587, and the balance of £19,000 is taken from reserve, making available £9,947. After paying the preference dividend and transferring £3,500 to depreciation fund, £1,355 is carried forward.

**New G. and S. Processes Syndicate.**—The statutory report shows that the number of shares allotted is 336,406 of 1s. each. The total amount of cash received in respect of shares is £5,095. Payments to April 15 comprise: by debentures and creditors of old company, payable under reconstruction agreement, £3,679; preliminary expenses, £142; legal and other charges, £100; purchases, salaries and general expenses, £148, leaving a balance at bankers of £1,024.

**Ayrton, Saunders & Co.**—The profit and loss account for the year 1932 shows a profit balance of £7,172 and the amount brought forward was £72. The sum of £3,000 has been transferred from reserve, making £10,340. After deducting preference dividends and depreciation, there remains £125 to be carried forward.

**Goodlass Wall & Lead Industries, Ltd.**—A profit of £199,269 is reported for the year 1932, which compares with £219,148 in the thirteen-month period to December 31, 1931, and includes £9,981 profit on sale of investments. The ordinary shares are to receive 3 per cent., against 2 per cent. in the previous year, and £52,299 is to be carried forward, compared wth £30,297 brought in. The annual meeting will be held at Winchester House, London, on May 10, at 2.30 p.m.

# Lever Bros., Ltd.

## A Notable Expenditure on Advertising

The 39th annual general meeting of Lever Brothers, Ltd., was held at Port Sunlight, Cheshire, on April 27, when Mr. Francis D'Arcy Cooper (chairman of the Company) presided, supported by the Viscount Leverhulme (governor of the company). It was announced that profits for the financial year reached the astounding figures of £6,228,162; this compares with £5,903,498 for 1931 and £5,749,659 for 1930. The total capital expenditure for the year, before taking into account subscriptions for further shares in the United Africa Co., amounted to £2,512,583. This capital expenditure has been financed largely out of depreciation written off during the year. Over and above the sum set aside for depreciation, £1,019,470 was charged against revenue for maintaining the various properties and plant of the concern in good condition.

Turning to the home business other than soap, the British Oil and Cake Mills, Ltd., has had a fair year, though the profits show a substantial decline on 1931. The canning group has had a successful year, the profits for 1932 being £298,345, against £261,903 for 1931. Whaling in the Antarctic has been satisfactory, and profits have increased from £118,795 to £168,870. Excluding the West African businesses, the total profits taken to revenue from the overseas companies was £2,821,692, a decrease of £24,248 compared with 1931.

Export soap trade, which is again over 90 per cent. of the total soap exports of this country, shows once more a decrease, this time of 15 per cent. on tonnage and £74,971 in profits. Expenditure of the company on advertising during the year was greater than that of any other concern in the world.

# Forthcoming Events

**May 8.**—Royal Institution. General Meeting. 5 p.m. 21 Albemarle Street, London.

**May 9.**—Institution of Petroleum Technologists. Discussion on the arrangements for the forthcoming World Petroleum Congress. 5.30 p.m. John Street, Adelphi, London.

**May 10.**—Institute of Metals. Twenty-third annual May lecture. "Quenching and Tempering Phenomena in Alloys." Mons. Albert Portevin. 8 p.m. Institution of Mechanical Engineers, Storey's Gate, London.

**May 10.**—Institute of Fuel (London Section). "Air-Gas Flow in Open Hearth Furnaces." Dr. V. H. Legg. 6 p.m. Burlington House, Piccadilly, London.

**May 11.**—Oil and Colour Chemists' Association. "Some Observations on Colloidal Behaviour in Paint and Varnish Systems." W. E. Wornum. Annual General Meeting. 7.30 p.m. 30 Russell Square, London.

# New Companies Registered

**Gas Syndicate, Ltd.**, Bush House, Aldwych, London, W.C. Registered April 22. Nominal capital £300 in 1s. shares. Technical, industrial, wholesale, retail, manufacturing, consulting and research chemists, etc.

**Bristol Manufacturing Company, Ltd.**, 20 Cannon Street, Manchester. Registered May 1. Nominal capital £100 in £1 shares. Manufacturing chemists and merchants, wholesale distributors and dealers, factors, agents, importers and exporters of all toilet preparations and electrical accessories for the hairdressing and other trades, etc. Directors: H. F. Johnston, "South Cliff" 301 Great Clowes Street, Higher Broughton, Salford, and G. R. Roberts.

**Chef Salt and Sundry Company, Ltd.**, Industrial Works, Heywood Street, Hyde Road, Manchester. Registered April 25. Nominal capital £3,000 in £1 shares. To acquire the business carried on by W. Edmondson, J. E. Edmondson and W. Bradshaw in partnership as the "Chef Salt and Sundry Company," at Industrial Works, Heywood Street, Hyde Road, Manchester, S.E., together with all or any of the assets, and in particular the trade marks 346847, 444669 and 444740, and to carry on the business of dealers in and packers of salt and chemists' sundries, etc. Directors: W. Edmondson, 53 Old Hall Lane, Longsight, Manchester, J. E. Edmondson and Walter Bradshaw.

# From Week to Week

THE APPOINTMENTS COMMITTEE of the Faculty of Biology have appointed Dr. Dixon to the Cambridge University Lectureship in Bio-chemistry.

THE ACADEMIC BOARD of the University of Wales has awarded the degree of D.Sc. to Mr. Alan Edwin Bradfield, Ph.D., for works of research in the Department of Chemistry.

SIR GEORGE BEHARRELL, president-elect of the Institution of the Rubber Industry, on April 27 presented the Colwyn gold medal to Mr. W. H. Paull for his services to the pneumatic tyre industry.

NEGOTIATIONS HAVE BEEN COMPLETED for the public exhibition of the British Road Tar Association's general interest talking film, "The Highway," and the Association has issued a list of 27 cinemas at which the film will be shown during the next five weeks.

SIR HUGH O'NEILL, M.P., speaking at the annual dinner of the Institution of Mining and Metallurgy, presided over by Dr. S. W. Smith, on April 26, said gold mining was as much a legitimate industry as any other industry in the world. In the past it had been connected with a certain number of undesirable episodes but, as an industry, it was as important to the world as any other.

A PORTRAIT of Sir William Bragg, director of the Royal Institution, painted by Mr. William Nicholson, was presented to the institution on May 1. The presentation was made on the behalf of a few friends of the institution by the hon. secretary, Major Charles E. S. Phillips, and received by the president, Lord Eustace Percy. The portrait is to be hung in the institution.

UNDER A TRADE LOANS (GUARANTEE) BILL now before the Parliament of the Irish Free State, £1,000,000 is to be available for assistance to industries in that country. In view of the Government's import duties on many chemical products it is considered likely that they will give favourable consideration to projects for opening up the chemical industry in that country, or the extension of existing concerns.

ADDITIONAL LISTS OF ARTICLES chargeable with duty under Part I of the Safeguarding of Industries Act, 1921, have been issued by the Board of Trade, and will take effect as from May 12. These lists refer to articles under the headings of optical instruments, scientific glassware, scientific instruments, synthetic, organic and other fine chemicals. Copies of the lists may be obtained from H.M. Stationery Office, price 2d. net.

THE NATIONAL "SAFETY FIRST" ASSOCIATION is holding a congress in London, from May 24 to 26. The scope of the congress is wide, including an instructional visit to the Gas Light and Coke Co.'s research laboratories, and a talk by Mr. C. K. Atkinson, of Lever Brothers, Ltd., on "Safety Education of the New Employee." Mr. Arthur Dorman, of Dorman, Long and Co., Ltd., will be in the chair at this talk, which will take place on May 26, in the morning. In the afternoon a demonstration of fire fighting will be given by the Pyrene Co., Ltd.

A BROCHURE WHICH DESCRIBES THE MANY USES to which zinc and the by-products of zinc ores are applied has been issued to shareholders by the directors of the Imperial Smelting Corporation. The importance of the zinc smelting industry from an Empire viewpoint and its striking development in this country since the war are among subjects dealt with in a foreword by the chairman, Sir Robert Horne, and an interesting feature is a chart showing the numerous manufactures into which the products of zinc ores enter. Copies may be obtained from the secretary of the Corporation.

THE APRIL ISSUE of the Journal of Scientific Instruments describes a simple and inexpensive device for the rapid conversion of a simple Dubosq colorimeter into a nephelometer of such an accuracy as to be capable of determining $10^{-6}$ N solution of potassium chloride, with an accuracy of 5 per cent. The same instrument has also been adapted to the colorimetric measurement of hydrogen-ion concentration with an error of 0.01 *pH*. A permanent inorganic colour standard for the bromo-thymol-blue range (*pH* 6.0 to 7.6) is described with a mean error of 0.015 *pH* in this instrument. The article is by Dr. J. Grant and Mr. J. H. W. Booth, of the Hackney Technical Institute, London.

THE AMERICAN CHEMICAL SOCIETY will hold its eighty-sixth general meeting in Chicago, from Monday to Friday, September 11-15 next, and on this occasion members of other scientific organisations are invited to attend on exactly the same basis as members of the American Chemical Society. Papers will be presented on the afternoon of the Monday, the morning and afternoon of Tuesday, Wednesday and Thursday, and the morning of **Friday. Outstanding symposia on subjects of current scientific interest have been arranged, as well as the usual social functions. The "World's Fair" at Chicago will be open at this time and the special chemical section will prove an additional attraction.** Those interested should apply for full particulars to Dr. Charles L. Parsons, secretary of the American Chemical Society, Mills Building, Washington, D.C.

THE ABBEY FUEL WORKS, Skewen, Glam., which has been closed down for a long time, has restarted operations.

PRINCE GEORGE will visit Irlam, Lancashire, on Tuesday, May 9, for the official opening of the new coke oven and by-products plant and canal wharf of the Lancashire Steel Corporation.

PROFESSOR A. M. LOW opened a hydrogenation exhibition at Charing Cross Underground Station on May 1. In his speech he declared that amongst the possibilities of hydrogenation was the converting of sawdust into sugar.

THE PAPER on "Effective Manufacturer—Dealer Co-operation," which was to have been given by Mr. E. D. A. Herbert, at a meeting of the Business Research and Management Association of Great Britain, at Anderton's Hotel, Fleet Street, on Wednesday, May 3, has been postponed until next session.

COVENTRY PUBLIC LIBRARIES COMMITTEE has compiled a commendable list of text books relating to engineering and technical science. The list does not pretend to be exhaustive, but represents a selection of the more important technical books added to the libraries during the past two years. The list comprises about 235 books, several of which deal with chemical technology and metallurgy.

MR. F. D'ARCY COOPER, presiding at the annual meeting of the Niger Co., Ltd., on Monday, intimated that the directors intend to convene a meeting of the holders of the 5 per cent. consolidated guaranteed debenture stock, at which the board will seek power to issue stock bearing interest at a rate not exceeding 5 per cent. Mr. Cooper said that the improvement in the position of the United Africa Co. had been maintained, the accounts for the five months to September showing satisfactory results.

A MEMORIAL TABLET to Mr. James Grant has been constructed in the church of St. Gabriel, Middleton Junction. Mr. Grant was lecturer in chemistry for 35 years at the College of Technology in Manchester. He was especially interested in the chemistry of brewing and foodstuffs, and was highly esteemed by leaders in those trades in which fermentation is an important process. He wrote a book on the chemistry of bread-making and another on the raw materials of the confectioner's trade, and he revised Amos's work on the processes of flour manufacture.

MANY UNITED KINGDOM FIRMS are seeking to establish connections in China. The Commercial Counsellor at Shanghai points out that in correspondence with local firms, it is important in their own interests that United Kingdom firms should give full information about themselves, and furnish commercial references. The Commercial Counsellor is of opinion that by following this course, which is usually taken by other firms entering the market, United Kingdom manufacturers and merchants would increase considerably their chances of securing the right connections with the least delay.

IT WAS REPORTED at the annual general meeting of the Scottish section of the British Association of Chemists held in Glasgow that despite the industrial depression, good progress had been made, and the membership continued to increase. Mr. David Lever presided in the absence of the chairman of the section, Mr. Macmillan. It was stated that during the year under review a large sum had been disbursed to unemployed members. Good work had been done by the appointments bureau in introducing positions to members, many employers having approached the bureau direct.

OWING TO THE LARGE NUMBER OF TELEGRAMS and letters received protesting against the proposed duty on heavy oil announced in the Budget, the National Union of Manufacturers has invited affected members to furnish immediately full information of hardship which will result from the tax so that the Union may prepare a case to place before the Chancellor of the Exchequer. Sir Charles Hipwood, the director of the Union, in an interview, said the new duty would add 30 to 40 per cent. or more to the cost of fuel in those factories which use oil as fuel, and would cripple their productive power. It would also do the most serious damage to companies making apparatus for burning oil fuel.

DURRANT IONS, motor driver, was summoned at Doncaster on May 2, for exceeding the 30-mile-an-hour limit with a motor-van, and his employers, Athole G. Allen and Harry Glenwright, of Bowsfield Lane Chemical Works, Stockton-on-Tees, were summoned for aiding and abetting, and also for permitting Ions to drive more than eleven hours without a break. It was stated that Ions, with a load of 4,000 lb. of T.N.T., drove at 45 miles an hour. Ions said that on occasions he had driven sixteen hours with stops only for loading and meals. He had had journeys of 482 miles in 24 hours, with an interval for sleep. The magistrates adjourned the summonses, expressing the opinion that the police had not properly prepared the case.

A TRAVELLING COMMISSION of the "Back to Coal" movement has begun an investigation of a number of new methods of utilising coal-using appliances for substitution in place of oil- and petrol-driven vehicles for road passenger services. Its first calls were Shrewsbury and Birmingham. The commission is headed by the Lord Mayor of Cardiff, Alderman C. F. Saunders, who is president of the "Back to Coal" movement.

THE FIRST OF A SERIES of "Research and Development" lectures, instituted by the British Science Guild for the purpose of directing attention to the importance of research—both purely scientific and technical—and the utilisation of its results in the service of mankind, will be given by Sir Harold Carpenter, Professor of Metallurgy in the Royal School of Mines, in the Carpenters' Hall, Throgmorton Avenue, London, E.C.2 (by permission of the Carpenters' Company) on Tuesday, May 16. The chair will be taken by Lord Melchett. The subject of the lecture will be "Metals in the Service of the Human Life and Industry." Tickets, for which there is no charge, are obtainable on application to the Secretary, British Science Guild, 6 John Street, Adelphi, London, W.C.2.

AT A LUNCHEON AT THE SAVOY HOTEL on April 28 to mark the introduction to the public of Britain of the first hydrogenated product, Mr. Frederick J. Wolfe, chairman of the Anglo-American Oil Co., said that the company was the first to introduce the petrol pump and also the first to market a leaded anti-knock fuel —Pratts Ethyl petrol—and it was the pioneer in this country in the matter of this motor oil which is produced by the hydrogenation process, and which is known as "Essolube." Mr. David S. Paul, manager of the technical department, gave details of the qualifications necessary in a lubricating oil, enumerating five of the more important, namely, viscocity index, pour point, stability, coke value and flash point. He said the superiority of "Essolube" in all characteristics could be clearly demonstrated.

ACCORDING TO FIGURES PUBLISHED RECENTLY by the Dominion Bureau of Statistics at Ottawa, the total production of copper in Canada last year was 247,678,503 lb., worth £3,058,840 as compared with the 1931 output of 292,304,390 lb. which was valued at £4,822,813, a decrease of only 15 per cent. in quantity but 37 per cent. in value.

MR. G. A. WHITELEY, presiding on April 27 at a meeting of the 7 per cent. first mortgage debenture stockholders of the Compania Salitrera Anglo-Chilena, at Winchester House, said he imagined that any reconstructed "Cosach" would be under the control of Chilean Government, and they would, probably through a sales organisation, allot production quotas among all producers of Chilean nitrate, as well as fix prices both to the producers and consumers. But it was yet to be discovered how such an arrangement would affect their interests. Mr. Whiteley is a member of a committee of stockholders appointed at the meeting to represent the debenture holders. The other members are: Messrs. J. S. Cannington, Charles Hendry, T. Smith and the Hon. J. Mulholland. Anglo-Chilena became a wholly-owned subsidiary of "Cosach" in 1931.

SIR GEORGE MACDONOGH, president of the Federation of British Industries, in a letter to Major Astor, president of the Advertising and Marketing Exhibition, writes: "The co-ordination of policy and centralisation of control, which have resulted from the formation of trade associations and national organisations, have led to increased efficiency of production, and the British manufacturers is to-day prepared to face any fair competition in this direction. A natural corollary to this forward policy of administration and production would seem to be a closer study of the problems of marketing and distribution of goods. I hope that all British manufacturers will take the opportunity of seeking for themselves at the Advertising Exhibition the most up-to-date methods of securing maximum sales."