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Notes and Comments

Government and Industry

ISSUES beyond the immediate import of his argument are raised by the letter from Mr. Arthur Gledhill which appeared in THE CHEMICAL AGE last week. Mr. Gledhill suggests that the Government might save money for the national exchequer by reducing taxation in a definite manner. Sir Harry McGowan at the annual luncheon of the British Plastic Moulding Trade Association after remarking that courage, originality and initiative were necessary in industry to-day, bewailed the restrictions placed upon industry by laws and regulations, often lacking in elasticity. The Government, he claimed, could do much to help in the inception of those new enterprises that the country needs so urgently if it would relax the severity of some of the present practices. Building regulations were a case in point, and taking a line similar to Mr. Gledhill, Sir Harry asked that the scale of income tax should be revised and that there should be more generous allowance for wear and tear and for obsolescence of plant and machinery, particularly where new plant was involved and industry was entering new and unexplored fields.

There is more than ample labour available, there is an untold wealth of cheap money and cheap raw material—never was there such an opportunity for the manufacturer and perhaps never again will there be so fortunate a conjunction of favourable circumstances. But one thing is lacking; confidence has not yet returned to the full extent.

Restoring Confidence

ONE of the greatest functions of Government to-day should be to discover and remove the cause of that lack of confidence. Whether we hold that "Technocracy" is "bunk" or the birth of a wonderful idea we cannot conceal that it has served to direct attention to the fact there is ample power and material in the world for everyone to be given far more of the essentials and luxuries of life than most of us are receiving at present. In a world of plenty, millions are in want. One hundred years ago engineering was defined as "the art of directing the great sources of power in nature to the use and convenience of man." It cannot be said that engineering, or any of the other great sciences, have failed to achieve this object in so far as they have in a large measure "directed" or pointed the way to that ultimate object. Is it true that, as many think, including, if we do not misread its official organ, the Federation of British Industries, the failure to grasp to the full the enjoyment of goods and leisure offered us by the discoveries of science is

due to faults in international government and finance throughout the world?

If so, the task before the Governments of the world is clear. In the mean time, our own Government may well take the wider view suggested by so many leaders of industry that every political and financial move should be assessed in its widest aspect and that the reduction of unemployment is the greatest need at the present time. Many new ventures would be started and many more men employed if confidence could be restored. Any step that can assist in that direction should be tried, even if fraught with some slight measure of speculation.

The Combustion of Hydrocarbons

THE lecture delivered by Professor Bone before the Royal Society of Arts, and reported in THE CHEMICAL AGE last week, provided a fascinating account of forty years of research into an abstruse, and so far as can be seen at the moment, purely theoretical problem—that of the mechanism of combustion in hydrocarbon flames. The rate of combustion in an explosive flame is very great; the intermediate products of that combustion are very numerous; the actions taking place are very complex. In the twinkling of an eye, there is formed a mon-hydroxy compound, to be immediately succeeded by a di-hydroxy compound, followed by the complete breakdown of formaldehyde into carbon monoxide and hydrogen which in turn combine with more oxygen to form the familiar CO₂ and water. Acetaldehyde and formaldehyde, ethyl and methyl alcohols, acetic and formic acids have all been isolated from the oxidation products. Has not the very complexity of the reactions that occur in so minute an interval of time some lesson, some scientific significance? What is the relationship between chemical combination and atomic structure? The contrast between the difficulty of disintegrating atoms owing to the great relative distance between the electrons and the ease with which molecules can meet each other and interact, can move away and meet other molecules and again interact, is very marked. At some future time all such facts will be correlated into a homogeneous whole. That is the importance of work such as that of Professor Bone and his colleagues.

The Severn Barrage

THE report of the Severn Barrage Committee will have been studied carefully by the chemical industry to ascertain what are the prospects of cheap water-power in this country. It was estimated by Sir Alexander Gibb just five years ago that the average cost at the switch-board of hydro-electric power in the most favourable conditions in a large scale develop-

ment on a 100 per cent. load factor will for the future lie somewhere between 0.065 and 0.125 of a penny per unit, whilst for normal working in typical cheap power countries the outside limits are between 0.07 and 0.145d. as the cost of power delivered to a nearby factory in typical and average conditions. In England the figures to be expected would be somewhat higher, probably not below 0.16d. per unit. Sir Alexander further visualised the production of power from coal-fired stations in this country being reduced in cost to 0.175d. at 100 per cent. load factor.

The Severn barrage report indicates that power can be produced at two-thirds the cost of an equivalent coal-fired station. The Barrage Committee visualises the supply of current to the grid; one-thirteenth of the country's total power requirements would thus be cheapened by one-third—a total price reduction over the whole current of 2½ per cent. The cost estimated in pence per unit is far above the figures of Gibb, probably because, being grid current, a load factor of only 34 per cent. is visualised. We suggest that the committee should recalculate to a load factor of nearer 100 per cent., and that the price reduction should not be spread over the whole country, but should be given to industries established in the immediate neighbourhood of the barrage. Based on Gibb's estimate of 0.175d. for the most modern coal-fired stations, the water-power should be available at 0.115d. per unit. It might then be possible to establish new chemical industries using this cheap power, similar perhaps to those at Shawinigan.

Developments in Plastics

THE Plastics Industry Exhibition, which is to open at the Science Museum at South Kensington on April 5, is an event of some importance. The public uses the products of the plastics industry without realising that they are produced by a variety of processes from a diversity of substances that are totally unlike the finished article. Plastics may not have the astronomical turn-over of the coal or the iron industries, but it has been computed on good authority that the goods produced may be worth as much as £15,000,000 per annum. It is, indeed, an industry totally unlike many other industries in that it has enjoyed an altogether unprecedented expansion within recent years. It would not surprise us to learn that plastics was one of the oldest industries of all. Amber and other natural resins were known before the dawn of history and what is more likely than that prehistoric man or woman moulded it into ornaments?

The chemical industry has much to congratulate itself upon in the development of plastic materials. The inception of new industries, not only new processes, is the most important need in the world to-day if we are to provide work for all. The gramophone industry gave plastics a great incentive to expansion; at one time the manufacture of records required no less than 20,000 tons of plastic material per year in this country alone. The film industry is also a large user; the wireless industry requires plastics in no small quantity. Thus three new industries, which in themselves have been instrumental in absorbing millions of our surplus population, have given a powerful stimulus to a new chemical industry that in its turn has employed many, has found new products, has found new uses for its old

materials and to the expansion of which there is no end. We have heard it suggested that we are on the verge of a "plastics age"—an age when many metals and most wood will be replaced by plastics.

Unlimited Plastic Materials

There seems to be no limit to the materials that can be used in the plastics industry. Wood in the form of cellulose, is one of the greatest raw materials and the basis of the artificial silk manufacture; milk in the form of casein for buttons, "horn" handles and many other things; natural resins, shellac for the gramophone and wireless manufacture; the whole range of synthetic resins derived from phenol or cresol and formaldehyde and indissolubly associated with the name of Dr. Baekeland; all these and many another might be cited.

To some, however, the most interesting developments may seem yet to come. The phenols from low temperature tar have been shown, notably by Professor Morgan and his co-workers, to be highly suitable for the manufacture of bakelite products. We recently described a new process for the manufacture of plastics direct from coal; there are other substances coming tentatively into use that may prove to be exceedingly interesting. A new chemistry is growing up around the new industry. No one has yet produced a definition of a plastic that has satisfied everyone. Are we to take the physicist's definition of a plastic as did Dr. Jenkins in his recent paper before the Society of Chemical Industry? Or should we follow Thorpe and regard it as "a solid material capable of being modelled or moulded into shape and the flash surface of which coalesce under pressure"? Or should we agree with Sutermeister in describing plastics as bodies which in process of manufacture soften sufficiently and usually, though not necessarily, under the influence of increased heat and pressure so that they can be pressed or poured to fill moulds or forms rigid at ordinary temperature or pressure? We are inclined to believe that a definition such as Sutermeister's is the best *industrial* definition.

A May Day Reminder

MAY DAY—Monday May 1—is the closing date for entries for the Chemical Industry Lawn Tennis Tournament, which has been extended this year to embrace men's singles as well as men's doubles. From the number of applications for entry forms which have reached us this week it is clear that the tournament, inaugurated by THE CHEMICAL AGE in 1931, is growing in popularity among those members of the chemical industry who find their recreation on the courts. It serves to bring principals and employees of chemical firms together under pleasanter auspices than are possible in the normal course of business, and the friendly rivalry which it promotes between players from all parts of the country is a welcome antidote to the sterner competition of trade and commerce.

The tournament is a national one, and we hope this year to see an increased entry from the provinces. For the early rounds, the country will be divided into areas so that the best players in each area will have equal opportunities of reaching the finals, which will, as in previous years, be played in or near London. The simple rules governing the tournament are reproduced in another page, and entry forms are obtainable from the offices of THE CHEMICAL AGE.

The Chemist in Industry

Research, Realisation and Reward

MOST teachers of chemistry fail in one particular; they make no attempt to give the student the right attitude towards economy of materials and methods, said Dr. J. E. G. Harris in his paper, "The Chemist in Industry: Research, Realisation and Reward," read before the Scottish Section of the Institution of the Rubber Industry, on March 28. In the laboratory we are cheerfully told to add an "excess" of this or that reagent, but the necessary magnitude of the excess is rarely indicated or even discussed except in the vaguest terms. This means that the student starts off with wrong views, if he has any views at all, on the question of "costs." The average chemist, Dr. Harris added, is lacking in an appreciation of the economic side of his work. Such an appreciation may come to him later on in his career, but to its lack in the early stages may be attributed not only the failure to obtain the maximum results from a good deal of chemical research, but also the comparatively low status of chemists at the present time.

One of the first things a research worker has to realise is that the question of cost is paramount in industry. Alongside almost any chemical equation can be written equivalent statements which are of the utmost importance to the industrialist. The chemical substances themselves must be considered not as so many molecules of pure text-book material, but as so many hundredweights or tons of pure or crude substances, purchasable in large or small lots, delivered packed or naked at works, at definite prices and discounts which may fluctuate for many curious reasons. Thermochemical data cease to be a question of a few calories on one side or other of an equation; they become a matter of pounds of coal or steam, or units of electricity consumed. The ubiquitous H_2O , which runs through all our equations, becomes something of supreme significance, which may need to be added at much cost or removed equally expensively. Reactions which in the laboratory one lightly described as "reversible," must be rigidly controlled or cajoled till they run in one direction only. The incidental precipitate which, in the textbook, is casually "filtered off and removed," in the industrial process may choke every filter known to science; even if removed successfully it is something the firm has paid for and represents a dead loss if not disposed of usefully, or at least in a way which will not offend the sanitary authorities or call for the attention of the local conservancy board. Everything is a question of cost, expressed in terms either of time or money—materials cost, labour cost, selling costs and oncosts—and it is here that the average research chemist is usually lacking in knowledge.

Every industrial chemist should have some knowledge of business principles. Without this he is not only ill-equipped to further his own discoveries, but he is also liable to earn and even deserve, a certain measure of contempt from his business colleagues.

Inattention to Business Matters

It is largely this inattention to business matters on the part of the majority of industrial chemists that has caused the management of so many of our industries to be in the hands of business men rather than technical men. There are also other reasons. One is largely a lack of certain opportunities on the part of the chemist, the dice being loaded against the chemist from the beginning. This can be illustrated by taking the case of two men of similar intellect—both entering a certain industry at the same time—one a chemist and the other entering on the business side. Neither is very useful at the beginning, but in due course the chemist begins more or less to earn his salary in the laboratory, as does the business man in the office. One day there arises an occasion when someone in a minor position is required to represent the firm in some small outside matter. Either the budding chemist or the embryo business man could do the job. But the business man is chosen almost invariably, and for several reasons. In the first place he is known to the management; he is under their eye all day, speaks their language and thinks along their lines. The chemist, on the other hand, dwells in the laboratory and is rarely under the mana-

gerial eye. Secondly, if the chemist leaves his laboratory, a certain definite piece of work ceases for the time being, whereas the young business man is not so difficult to replace, his functions being less specialised. So out goes the young business man. The incident repeats itself from time to time. When technical matters are involved the business man probably consults his chemical colleague first, so that he gradually obtains sufficient superficial knowledge of technical matters to carry him through. By meeting a variety of men and encountering the problems of the market, he becomes in time a knowledgeable man of the world. In time, also, he becomes known in the outside world as the representative of his firm and in many cases, as we all know, he becomes the firm itself! The chemist, meanwhile, continues to keep the wheels turning, but rarely rides on them.

"This arrangement," said Dr. Harris, "is not the best thing for the firm." There is a mean course which is seldom taken. For the good of the chemist, the business man and the firm itself, the responsibilities of management should be more equally shared. There are far too few chemists on the boards of industrial concerns to-day, and industry suffers in consequence. A board cannot make satisfactory technical decisions without fearless technical advice and this only comes with difficulty from people in the position of obscure employees, as chemists often are. "Men of science," added Dr. Harris, "are essentially truthful; they are in the habit of dealing with facts and rarely lie to themselves. If scientists took more part in industry on the business side, I think the general standard of business morality would be higher; there would be more recourse to reason, and less to bluff and doubtful practice. The business man needs technical men on his boards for his own protection. One can remember so many instances where a chemist on the directorate might have saved thousands."

Duplication of Investigations

One of the greatest causes of unremunerative expenditure on so-called research work is the unnecessary duplication of investigations. Speaking of his own experience, Dr. Harris said that after he graduated he was given a small research problem by his teacher, Professor J. Norman Collie. "The first thing he (Professor Norman Collie) did was to banish me to the library to comb the literature for everything done or suggested along this line. This preliminary survey took weeks, during which time the laboratory knew me not. It was, however, one of the most useful periods of my life. In the first place, I began to learn my way among the literature of chemistry. I learned to pilot my course through Richter, Beilstein and Friedländer, and to branch off from them into the various journals of the world's scientific societies. Also, I found it advisable to polish up my small knowledge of French and German. During my reading, I saw my own trifling ideas and inspirations forestalled, proved or disproved, but I may say that I learned my subject thoroughly and, in the end, I was able to begin my own investigations more or less exactly where the last worker left off." As many chemists of experience know, especially those who have had the advantage of beginning their research career academically, this clearing of the ground is essential, but it is not fully realised by the young research chemist, whose fingers itch for the test-tube, nor by many research chemists who have been brought up exclusively in industrial circles. It is even less understood by most employers. Few of the latter can restrain themselves at the sight of a "highly paid" research chemist merely reading. Yet, anyone who has, for example, had the conduct of patents through the patent office, will admit the amount of ignorance displayed even by serious and well qualified workers of previous research in their own field, and the amount of money which is wasted annually, obtaining results which are already on record and available for the price of a few hours reading.

The first thing a research chemist should learn is the use of the chemical literature. Chemists should have reasonable access to libraries. Not every firm can afford a big library, although compared with other business charges, the cost of

a useful chemical library is not great, but the management should not begrudge time spent by their workers in the adjacent libraries belonging to universities, scientific societies or municipalities. The first stage in any research is reading; then comes experiment. It is impossible to lay down any definite rules, as so much depends on the nature of the problem. The preliminary experiments should be conceived as broadly as possible, so that a wide field is covered in a general way. They should be amply recorded, and no result, whether positive or negative should be neglected when writing up the day's work. Some observers keep two kinds of notebook, one for rough observations and the other a kind of fair copy. Some workers write the full story whilst it is fresh in their mind, but for those who cannot follow this method a rough notebook is definitely to be preferred. Detailed analytical investigations are as a rule not necessary at this stage; all that is required is an approximation which expresses results broadly in a comparative manner. Side-lines, however fascinating, should not be pursued, although full notes concerning them should be made, to be followed up as opportunity arises. As far as possible, all specimens and incidental products which appear of the slightest interest, should be filed away for future attention. The precipitate thrown in the waste bin to-day is always the one we need desperately to-morrow. Full notes regarding all materials used should be made and reference samples retained. Where absolutely pure materials are unobtainable, it is important not to pass on to a new delivery, until its suitability has been tested in the light of the last batch. Many a result, which has been ascribed to some experimental modification deliberately introduced, has eventually been found to be due to a new lot of solvent or catalyst.

The Need for Pure Materials

It should be unnecessary to tell research chemist not to vary more than one factor at a time. It is irritating to obtain a result which may be due to either or both of certain new features introduced simultaneously. Begin with pure chemicals. There are classical cases where unsuspected impurities have been responsible for beneficial reactions, but far more cases where such impurities have hindered them. If you must begin with impure materials, you should at least know how impure they are and what the impurities consist of. One should never be in the position of the man who cannot repeat an experiment because he has not controlled his initial material. In industry you will often be tempted, and sometimes almost forced, to use crude materials, but do not do it, even though you know that any process evolved will finally be run with chemicals of commercial quality. Find the possibilities of the very best conditions and then you have a standard with which to compare the results obtained under the conditions which are actually practicable in the large scale.

In drawing conclusions from experiments, absolute truthfulness and a judicial outlook are essential. "A very common failing of research chemists," said Dr. Harris, "is the inability, or disinclination, to criticise their own results. Optimism should show itself in our methods of approach, but not in the results. If we have to give estimates to our business friends we should put forward the lower approximation when we are discussing yields and the higher one when discussing costs. It is a fairly safe plan to add to the result of most researches what I call a 'pessimism factor,' equal to about 10 to 15 per cent., representing the difference between what we have obtained under favourable conditions and what we are likely to obtain in the earlier stages of bulk manufacture."

There are many types of industrial research. Some fortunate individuals have a clear, even if limited, field, in which they can move almost unfettered, freely prospecting for any interesting development which may touch their own line even remotely. Usually only a few chemists in large combines, or in State laboratories, have this privilege. Most of us have definite lines of inquiry laid down, governed strictly by commercial demands; often our research consists merely in improving or cheapening an existing process, or investigating failure on the plant. Even these researches may have their bright spots, however, and some day or other we may make an actual discovery, which may even be developed into an "invention," as understood by the laws of this and

other countries. It is important that the research chemist should know what to do in such circumstances. As we all know, it is possible to work new inventions secretly, in which case there is little or no redress against a competitor who makes the same discovery and cuts into our own field. On the other hand, we can take out a patent—which is a bargain between the State and ourselves—by which our invention receives protection against infringement for a term of years, in exchange for certain fees and the publication of methods. The patenting policy of a firm is decided by the management, but every research chemist should possess some knowledge of the patent laws of this country.

The Chemist and the Engineer

The research chemist has much to consider when he puts the results of his laboratory work into practice, and he will do well to "hob-nob" with engineers so as to profit from their experience of plant and materials. He should remember that engineers have in their direct charge large quantities of valuable and mysterious plant and machinery and are therefore respected by the management, so that their friendship and co-operation is a real asset. There is a danger of the chemist becoming at times rather subordinated to the engineer in industrial matters and he should use all his powers of tact and endurance to guard against this. The great thing to remember is that the engineer is the guardian and supplier of what represents his test-tubes and flasks but, just as he would not allow any laboratory furnisher to control his chemical work, so he must try, on the plant, to maintain the same attitude towards the engineer. Of course, cast-iron pots cannot be scrapped like test-tubes and one cannot re-design plant with a few lengths of glass tubing and a blow-lamp. Nevertheless, the co-operation between the chemist and engineer should be from the point of view that the chemical process in the main determines the form of apparatus, and not *vice versa*. Another criticism of industry in this country is that we are slow to scrap obsolete plant and to take advantage of advances in machinery. The chemist, in conjunction with the engineer, should always be ready to weigh up the financial benefits to be obtained by expenditure on modern apparatus against the losses due to relegating old plant to the scrap heap. Low yields, expensive repairs and reduced throughput soon eat into any economies made by working plant which is past its peak period of usefulness.

Co-operation with the Business Man

Just as co-operation is necessary between the chemist and the engineer, so is it necessary between the chemist and the business man of the firm. The business man is very often directly responsible for the selection of the work undertaken by the chemical staff. He has an opportunity of learning the needs of the industry greater than that of the cloistered chemist, since he is in personal touch with customers and competitors as regards new requirements and also knows where the shoe pinches in the matter of prices. The business man should discuss these points frankly with the research chemist, on the common ground of mutual interest. He should give the chemist, and the chemist should be trained to seek, all the necessary information which normally does not filter through into the laboratory. The question of raw material supplies, for example, is a complicated one. A cheap starting material in the North of Britain may be expensive in the south when loaded with freight charges. Concessions in the purchase of different fuels or power may be available, rendering the use of one of them more economical and so influencing the choice of processes. The kind of labour available for the hoped-for process may also decide the initial line of attack in the laboratory. The question of the nearness of the market has to be considered and the available means of transport, both for finished article and raw material. By one path a cheap, but readily saleable by-product may be obtained whereas by another a potentially valuable material may be produced which, in view of local circumstances, may be a drug on the market. On all these points the business men of the firm should impart information as freely as possible and not treat their specialised knowledge as a secret asset which raises them above the technical workers, as they so often do, whilst the chemist himself should realise the connection between prime costs, oncost and selling prices.

Growth of the Plastic Moulding Trade

Prince George on its Rapid Development

THE phenomenal development of the plastic moulding industry in Great Britain in recent years was referred to at the third annual trade luncheon of the British Plastic Moulding Trade Association at the Savoy Hotel, London, on March 23, at which Prince George was the guest of honour. Captain J. W. Barber presided over about 250 members and guests. In addition to Prince George the guests included Sir Harry McGowan, chairman of Imperial Chemical Industries, Ltd., Sir Allan Anderson, Sir Phillip Nash, Sir Henry Lyons, Lieut.-General Sir Louis Vaughan, Sir Francis Bingham, Dr. W. H. Coates, Colonel R. K. Morsom, Sir Harold Hartley, Major F. A. Freeth, Dr. E. F. Armstrong, Mr. Peter Bennet, Mr. Peter Chance, Major A. E. Hodgkin, Major F. D. Maclean, Mr. L. F. Nickell, Mr. W. Owen-Grimiths, Mr. H. V. Potter, Mr. S. Rogerson and Sir Walrod Sherwood.

PRINCE GEORGE, in proposing the toast of the Association, said he supposed there was no one who had not seen some of the products of the plastics industry at some time or other; but possibly there were very few people who had seen all they made. Some eighty years ago the foundations of the industry were laid, but very little progress was made until recent years. To-day a large industry had developed, and their Association and their trade made a special appeal, as practically all their raw materials were British. They also employed a large number of British workpeople, and they had made demands upon the traditional skill of the British engineer, which, he was sure, had been amply met.

Products that are Really New

Through his work at the Home Office he had been able to appreciate the value of the plastics industry. It was good to know that many of their products were really new and that nothing else could serve the purpose for which they were used. Dean Swift made one of the characters in "Gulliver's Travels" remark that "every word a man utters corrodes his lungs and contributes to the shortening of his life," and he therefore suggested that men should communicate with each other by carrying about objects which would serve as signs for conversation. If that was the case to-day, it was certain that the demand would be met by plastics, as no other material could be used so well for that end, and their products would speak for themselves.

He hoped that the members of the Association would overcome the difficulties that must be faced in the case of a new and rapidly growing industry, whose importance in modern manufacturing processes could not be over-estimated. He congratulated the Association upon its remarkable achievements in the face of the prevailing world depression, and wished its members every prosperity in the future.

Captain BARBER, in responding to the toast, said that although as an association and as an organised industry they were only three or four years old, it must be acknowledged that some of their achievements dated back to the earliest dawn of the arts of chemistry and engineering, to which arts they paid special acknowledgment. It was gratifying to them to feel that they had made such progress in the terrible period through which they had been passing. When they saw the economics of the world thrown into the melting pot, and the basic and staple industries of the world hanging in the balance, it gave them a particular measure of pride to feel that they had made such headway and had done so much to reduce the ranks of the unemployed.

Major H. C. PARKER proposed the toast of the guests.

An Old Industry Re-born

Sir Harry MCGOWAN, in reply, said that those concerned with the welfare of British industry had watched with the keenest interest the recent progress of the plastics industry. A craft almost as old as mankind itself, the manipulation of plastics had, during the last decade, been revolutionised into a modern science. With the applied sciences of chemistry and engineering as the foundation of modern technical developments, an old industry had been reborn. With their aid he did not doubt that, notwithstanding the recent

achievements of the industry, it was still only on the threshold of discoveries which would place it in the forefront of British industrial activities. Few people realise how wide is the range of domestic needs for which the plastics industry caters. Infancy needed the baby's rattle, the moulded cradle and perambulator. Through life itself they catered for a thousand demands. In youth there were toys and games; in the house every species of fancy goods, tableware and all kinds of container closures. They ministered to the caprice of feminine fashion with all kinds of toilet accessories; while the smoker, male or female, constantly used their products. Plastic pannelings and finishes were (or would be) ubiquitous in the house, the hotel, the shop, the ship and the office. Transport services, whether by air, by sea or by land, profited by the articles they produced. Modern communication was greatly facilitated by the properties of their products. Let them consider for a moment the range embraced by electrical accessories of all kinds, including all the services covered by radio, postal, telegraph and telephone work.

Unlimited Potentialities

These properties, taken in combination, were unique. Plastic materials were not only non-inflammable and non-corrosive, but also non-conductive to heat or electricity. They might display all the colours of the rainbow. In addition, while they were lighter than metal, their strength compared favourably when taken on a weight for weight basis, and they were also much less resonant conductors of sound. Considering the extraordinary manner in which the plastics industry had already penetrated into other industries supplying domestic needs, it was difficult to trace any limits of future technical potentialities.

The Association represented a first step towards the full organisation of the industry. In it were to be found those who made and supplied the materials, plant and tools, and last, but not least, those who fabricated the finished products. Much of recent progress had been made during, and was possibly stimulated by, an unprecedented economic depression; but that fact had also generated intensive competition, which, while possibly technically not unfair, was very difficult to meet. More comprehensive and more highly developed organisation might assist the industry in the struggle against intensive competition. It was inevitable that, with the development of national feeling abroad, some of the older outlets for trade should decline; it was, therefore, for us to tap every new source of industrial enterprise. We did not object to fair competition, but the kind we were meeting with from some foreign countries to-day particularly Japan, might require international action.

The Need for Initiative

It was to new industries like the plastics industry that we had to look to balance the inevitable decline in some of our older industries. Courage, originality and initiative were essential. Everyone was affected by laws and regulations. Unfortunately, they often lacked elasticity. Now, when we so urgently needed new enterprise, was the opportunity for the Government to help in relaxing the severity of some present practices. Building regulations, for instance, were still a tangle of inconsistencies, though some improvement had been made. Another example related to income tax—wear and tear allowances and obsolescence of plant and machinery—might be on a more generous scale where new plant was involved and industry was entering new and unexplored fields. Many conditions were favourable for advance. There was ample labour, there was cheap money, there was cheap material, a combination of factors which may not recur for years to come once the world's trade starts on the upward curve. The Government should also play its part.

Mr. W. J. U. WOOLCOCK proposed the toast of the Chairman, and paid a tribute to Captain Barber's work at the Imperial Conference at Ottawa last year.

Captain BARBER briefly replied.

Moulding Inquiries and How to Meet Them

The Preparation of Estimates

SOME points on the preparation of an estimate to meet a "moulding inquiry" were stressed by Mr. A. G. Snell in a paper read before the Midlands Section of the Institute of the Plastics Industry on March 24. The main heading in the complement of an estimate, said Mr. Snell, are precisely the same as the elements of cost as generally interpreted, namely, direct or productive materials, direct or productive labour, and overhead charges. From a sample, sketch or adequate description of a moulded articles there is little difficulty in estimating the amount of direct material required and experience allows us to estimate what allowance to make for waste or flash which is included in the estimate as a percentage on the total material used. The matter of direct or productive labour, also, is not very difficult to compile and is best listed under either process or operation headings, which headings should be printed on the estimating form in full so that none of them are overlooked. From these two elements we derive the prime cost, and now comes the most difficult calculation, namely, overheads.

Overhead Charges

There are at least five methods of recovering overhead charges in common practice, and it is very necessary that the person responsible for their application should thoroughly understand their complement, and keep constant check to ensure their accuracy and adapt percentages in accordance to their fluctuations. It is at this stage of estimating where many go wrong, and lack of knowledge of what exactly constitutes one's overheads is responsible for much of the undercutting in prices on the one hand, and failure to secure one's quota of orders on the other. It is useless sounding round until you hear what percentage your competitors are using and trusting to providence that if you use the same percentage you will be all right. Your competitor may be enjoying privileges such as freehold premises free from encumbrances; he may be possessed of more modern plant than you; he may be outside the city boundary enjoying a different labour rate than yours; or alternately, he may be saddled with expensive capital loans, heavy rental, high rating, and additional expense in many directions. All these items contribute to the varying percentages of overhead charges even amongst firms engaged in identical industries. It therefore behoves us to compute exactly our own overhead charge total, and endeavour by efficiency in every department and careful exercise of economy to keep the expenses down as much as possible.

The basis upon which you recover your overhead charges will largely be determined by local circumstances. For example, some firms recover their charges by adding a percentage upon direct or productive labour, others may recover through machine hour rates; others again upon a manual hour base. In determining which of the methods you do adopt, consequence should be shown to the basis which is most consistent.

The Works Estimate Form

The works estimate form may be divided up into five main headings—(1) dies, (2) material and powder, (3) operations, (4) waste, and (5) total works cost per 100 articles. Under the heading of "dies" there is number required or impression, steel, sundry purchases, productive wages, tool-makers overheads, and maintenance of dies during the manufacture of the mouldings. Under "material and powder" there is weight per 100 in lbs., cost of powder per lb., fittings moulded in, and fittings used on assembly. Under "operations" there is weighing, pressing, drilling, fettling, grinding, polishing, lacquering, and assembly. Against these operations the productive wages are calculated per 100 articles, plus the percentage of overheads on productive wages, which then gives works expenses. Under the item "waste" there is materials, fittings, productive wages, and works expenses. When this is calculated we get the cost of the die, the cost of maintaining the die during its pressing operations, the cost of powder per 100 mouldings, the cost of productive wages, per 100 mouldings, the cost of our works expenses per 100 mouldings, and the cost of our waste per 100 mouldings. We have now only to add profit and special agents commission,

or selling cost, to get a complete estimate of the moulded article.

Great care must be taken to ascertain the customer's requirements and his weekly requirements, which is governed by the number of impressions that can be designed in the die. The customer should always be willing to accept modifications to his design that will help him to get a satisfactory article, uninterrupted delivery, and an article at the lowest possible cost. When these points are thoroughly threshed out to the satisfaction of the customer and ourselves, it is possible to design the die. All articles except those of a small and robust nature must be studied with a view to ascertaining the correct material to use. You may find that the material for one particular article will be best made in the same powder that you already use for another in large quantities, and will therefore enjoy a minimum price; should you require a special material a slightly increased price may result. If this matter is considered at the estimating period, it not only safeguards prices, but ensures that it is tackled in good time when you are fortunate enough to commence production. The question of fittings (inserts moulded in) must be considered very carefully. Unless the operations are studied along these lines it often happens that inserts are the cause of considerable scrap, and slow up production more than any other factor.

Weighing and Pressing

The most economical form of weighing for quick curing jobs is undoubtedly the tablet, but care should be taken to ensure that preformed material is suitable for producing the finished product. For slow curing work the operator has ample time to weigh up during the period of the cure, and if this is the case weighing is merged into the second process under the heading of pressing. On tool design, and press design, depends the easy handling and speedy operation of the mould, remembering that, particularly on multiple dies, a minute saved may gain the order, or a minute lost may lose the profit. The cost of drilling and fettling are in most cases easily ascertained and a glance at records of similar work verifies the figures. Grinding is one which we should endeavour to avoid, and only resort to when it is found absolutely necessary. The manufacturing aim should be clean-cut work, leaving the die as near to the finished state as possible.

Polishing, however, calls for considerable attention. While all prospective customers require a perfect finish, we must not depend too much on a "mop" to achieve this. One extra day in the tool-room polishing the die is repaid a thousand times, not only in wages but in the respect paid by your customer.

Waste, said Mr. Snell, in concluding his paper, is a problem which plays an important part in the final cost. It is a curse which we have all tried to eliminate, but nobody has ever entirely succeeded, or ever will. It creeps into all operations and all departments, however careful we may be and we can only hope to keep it at a minimum by checking it at frequent intervals, and from the data obtained we can ascertain the percentage necessary to account for in the final cost.

Indian Water Hyacinth

Commercial Exploitation Possible in India

THE Chemical Laboratory of the University College of Science, Calcutta, has been carrying on experiments on water hyacinth with a view to finding out its commercial possibilities. The isolation of a powerful bacteria was first effected from horse dung, which in a pure state was capable of fermenting cellulose and carbo-hydrates in general. This bacteria therefore affords a ready means of converting waste cellulose and hemi-cellulose into important commercial products. In a typical case, with rice straw, after hydrolysis with acids, the neutralised solution was fermented with yeast, the alcohol separated, and the residual liquor containing the pontoses was fully converted into acetic and formic acids, as also 10 to 20 per cent. of the pontoses into alcohol.

Alfred Mond: First Lord Melchett

A Great Biography

SHORTLY before his death Lord Melchett was asked by the editor of "Nuttall's Dictionary" to define "rationalisation." Though he is chiefly remembered as the founder of Imperial Chemical Industries, Ltd., the first great experiment in rationalisation, it will surprise most readers of his biography* to learn that Sir Alfred Mond put politics first in his ambitions and only devoted himself to business in the last few years of his life. It would be difficult to imagine a more unpromising start than was made by this future leader of industry. After failing in his examinations at Cambridge, where poker seems to have been his chief occupation, Mond spent ten years reading law before he went into the family business. The figure of Dr. Ludwig Mond dominates these early years and though Alfred owed so much to his influence, it is clear that the father completely overshadowed the son, who developed late and suffered so acutely from a sense of physical inferiority that he once vowed he would never marry. Fortunately he met Lady Mond not long afterwards, and her steadying influence at once began to overcome the diffidence which might otherwise have ruined his career. As it was, even after years of success in politics and business, his German origin and guttural speech were a constant handicap, and during the war he was subjected to the cruellest and most degrading calumny on this account, notwithstanding that he had served in the Cabinet and that his son of sixteen was already fighting in the front line.

If Mond was born with a silver spoon in his mouth, he certainly had to struggle throughout his life against tremendous personal odds which made his achievement all the more remarkable.

A large part of this book is devoted to politics, but his Parliamentary career is chiefly interesting for the part it played in his business development. The Free Trade campaign of which he was a leader for so many years, expressed his passion for freedom, and when Lloyd George's agricultural policy became a dominant issue in the party, Mond at once recognised it as a form of socialism and public control which in any form was anathema to him. His transition to the Conservative Party was an inevitable step in the light of this controversy, which illustrated his gift for going straight to the underlying principle of any question, which was perhaps the secret of his remarkable success in business. He contended that the whole history of the world had shown that the owner is the man who puts most energy, labour and money into his property. "When a man's own interest is not sufficient inducement to him to cultivate his land properly, no county inspectors are going to prove more successful. The whole idea of treating the agricultural community

like naughty children, ignorant of their own business, is fundamentally false." He added that Liberalism had meant nothing to him if it had not meant freedom.

His deep convictions in this matter had been shown in 1923, when Sir Alfred replied to Mr. Snowden's motion in the House attacking the Capitalist system. His speech was a masterly analysis of the principles involved in this controversy, which has become a supreme issue in politics, and it removed any charge that Mond was putting his own interests first in championing Conservatism in later years. "If the honourable

member could persuade me that he had a system which would abolish these social sores and improve the lot of the people of this country . . . I would to-morrow be his most earnest recruit. The fact that a few men in this country who are now rich could be worse off would not weigh with me. It would be a trifle compared with the social welfare of the country."

Shortly after his return to business, Lord Melchett convened the famous Melchett-Turner conference, which was a milestone in the relations of capital and labour, and gave rise to many of the proposals which were shortly put into practice in the great chemical combine which he founded. Mr. Bolitho's account of the dramatic moves which led to the formation of Imperial Chemical Industries reads like a novel, and it may be regretted that more space is not given to this culminating chapter in his subject's career. But Lord Melchett was interested in so many activities and no sooner was this great scheme effected than he passed

on to vigorous steps in connection with Zionism. In his son's opinion this was the one great passion of Mond's life, and he had bought a large estate on the shores of Lake Galilee, to which he looked forward to years of retirement. But that was not to be, for worn out by work he died after a brief illness at the early age of sixty-two.

Lord Melchett inherited from his father a taste for art, and collected many treasures at Melchett Court, which he loved to show to friends. This many-sided man, who knew to the full the delights of getting things done through commercial achievement, was also a philosopher, and in one of his last addresses he expounded the view that "living" was something more than going to an office. "Machinery is there to provide us with leisure and not to give us more work; transportation is there to give us more time, and not less."

Manufacture of Hydrogen

AT one of the recent meetings of the French Academy of Science, M. Matignon announced a new industrial method for preparing hydrogen by the action of water on methane produced from the gas obtained from coke ovens or petroleum deposits or from the hydrogenation of carbon.



* "Alfred Mond, First Lord Melchett" By Hector Bolitho. (Martin Secker 21s.)

Oil and Colour Chemists' Association

Annual Dinner and Dance

THE annual dinner and dance of the Oil and Colour Chemists' Association was held at the Trocadero Restaurant, London, on March 24. Mr. J. A. Frome Wilkinson, president, was in the chair, and there was a large attendance of members, ladies and guests, including Sir William H. Rothenstein (principal of the Royal College of Arts), Professor J. F. Thorpe (president of the Institute of Chemistry), Dr. H. Levinstein (vice-president of the Institution of Chemical Engineers), Mr. S. Romilly (president of the National Federation of Associated Paint, Colour and Varnish Manufacturers), Dr. E. F. Armstrong (chairman of the Association of British Chemical Manufacturers), Dr. A. E. Dunstan (vice-president of the Society of Chemical Industry), Mr. R. B. Pilcher (registrar of the Institute of Chemistry), and Dr. L. A. Jordan (director of the Paint and Varnish Research Association).

Sir WILLIAM ROTHENSTEIN proposed the toast of "The Oil and Colour Chemists' Association." He had, he said, been more instructed that evening as to the objects of the Association than he had been as a guest of any society. That came from his happy ignorance—a great quality in life. He had had a vague notion, having a careless eye, as so many painters had, that the Association was a society dealing with oils and colours in which he as a painter was naturally interested, and he had thought that he might get knowledge with regard to the mixing of the colours, because artists no longer mixed their colours, and had to trust to that which was handed on to them in the shape of ready-made tubes. A century ago artists bought their powders and mixed them. The Association, however, was a society which met to read papers on chemical subjects dealing with colours. He would like to feel that some day they might really get interested in that branch which particularly interested him; it was a fairly important one. The question of purity of materials also had some importance and he hoped he was right in thinking that they might some day touch upon that particular subject.

An Experimental Study

It might be of interest, as they were interested generally in culture, to know that for the first time there was to be an experimental study for mural decoration under the Board of Education, which was to start next autumn. It seemed to be an important move, because it was quite clear that the private patron was going to be gradually squeezed out, and somehow public authorities were coming in to use artists, as the Church and State used to use them, as good servants to express themselves in colour language. They wanted funds for that experimental work. He might, perhaps, find it a little difficult to pursue that, seeing that they dealt with oils and colours, though he would not say a letter received later would not be acceptable, very much as the Chancellor of the Exchequer received a letter from a conscious-stricken person who handed him £100 because he had cheated him of £1,000.

The PRESIDENT, in reply, said the Association was very interested in artists' materials; in fact, their immediate past-president, Mr. Noel Heaton, was famous for his investigations in that respect, together with many other members of the Association. Therefore, he did not want Sir William to think the members were entirely engaged upon industrial matters; they were, as a matter of fact, very interested in the proposal in connection with mural painting. Whether or not they had enough spare cash to help him in the matter was another question, but they were prepared to do anything they could. This dinner was the fifteenth dinner of the Association, and they were still progressing, and slowly increasing in membership. The Association started in connection with fatty acids and linseed oil, at which time he was not connected with it, but he well remembered coming first to the meetings of the Association at the invitation of their friend Mr. Palmer. As a visitor in those days, however, he was not allowed to join the Association, the members of which had to be in the industry; he was not in the industry and he appeared merely as an interloper. He mentioned that to show how the scope of the Association had increased. The Association still managed to keep going in these times of depression, which that evening they might temporarily forget.

Professor J. F. THORPE, responding to the toast of "The Guests," said he regarded himself as an oil and colour chemist, if only by a form of adoption, because both Mr. and Mrs. Jordan were old students of his and therefore he felt he had a personal interest in the Association. He envied the Association because it was a self-contained body. It had, he was told by the treasurer, some 400 members and an excellent journal. For the future, he suggested there must not be so much thought of co-ordination, collaboration and so forth. What it was necessary to think about now was the sectionalisation of their journals into parts for those who wanted them and understood them. The days of the universalist were past. The last universalist perhaps was Professor Odling. There was a time, he believed, when Professor Goldsmith, took the "Journal of the Chemical Society" to bed with him as light reading and read it again in the morning before he took his bath. Those days were past. One had only to consider in this respect that great organisation, the American Chemical Society. It was said by the secretary of that society that there were more words for a dollar in that journal than in any other journal in the world. Last year's journal and abstracts of that society totalled some 10,000 pages but if he could understand 200 of them that was all he could do. They occupied about a yard or thereabouts of space, and he considered that one of the worst examples of that lack of sectionalisation which was to be deplored.

Production of Barytes in Scotland

Development of Shipping Facilities

FACILITIES have been announced by British coastwise shipping services to stimulate an industry which is rapidly ousting certain German and Belgian exports to this country. This industry is the mining of barytes (barium sulphate) which has sprung up on the island of Arran in the Firth of Clyde. As the basis of all ordinary paints in place of white lead; for filling, in the rubber industry; for weighting of cotton and leather; for finishing processes in textile manufactures; as an insulating composition in electric cables and for sealing up oil wells, barytes, which is being produced in Glen Sannox, stands pre-eminent.

About £200,000 worth of barytes used to come into Britain each year from the Continent. Now it is being produced in Arran, taken by small vessels to Glasgow, crushed there, and sent to every part of Britain by coastal steamer. On the light railway between the mine and the quay where the ships load, a ton of it goes into a wagon a little larger than an outside perambulator. As coastwise shipping is co-operating with the company which operates the Arran barytes mines, the capture of markets which have been largely held by German and Belgian firms in the past is going on rapidly. New plant has just been installed capable of dealing with 20,000 tons of the mineral a year, or more than half of the amount normally imported into the British market from foreign countries.

Mr. G. Ernest Thomson, chairman of the Arran Barytes Co., Ltd., said in an interview last week: "We are, with the collaboration of the owners of coastal shipping, who recognise the possibilities of the establishment of an almost entirely new trade within our own shores, making satisfactory headway in securing trade which the foreigner has held for a considerable number of years. We have established the fact that in Arran we have barytes as fine as anything in Europe, if not in the world, and we shall launch out in competition in foreign markets in due course."

Irish Free State Pharmacopœia

UNDER powers conferred by the new Pharmacopœia Act, the Irish Free State Medical Council is building up a pharmacopœia. Certain changes in the British Pharmacopœia have been approved by the Free State Council, which, by order of the Government, became effective as of January 1, 1933.

Sulphuric Acid and Fertilisers

Development of Modern Methods of Manufacture

THE historical development of the sulphuric acid industry from the middle of the seventeenth century was described by Mr. E. M. Reid, B.Sc., A.I.C., of Richardson's Chemical Manure Co., Ltd., in an address to the Belfast Section of the Institute of Chemistry on March 4. He discussed in detail the old intermittent process, and its supersession by the continuous process, as well as the advent of the various improvements, *i.e.*, the Glover and Gay-Lussac towers, water-sprays and mechanical draught. In the section concerned with the production of sulphur dioxide, the remarkable fluctuations in the use of the various raw products were stressed, and the economic causes which were responsible were emphasised. The various types of burners, hand and mechanically worked; lead chamber construction (including such modern types as Meyer's tangential, and the Mills-Packard plant) and the construction and functions of the denitration and absorption towers were considered at some length. The century old theories and discussions of the chemistry of the chamber process from Davy (1812) to modern investigators, postulating the exist-

ence of tautomeric isomerides were also described, and the paper concluded with a reference to the manufacture of sulphuric acid from sulphates.

A second paper by Mr. Reid, on the subject of fertilisers, commenced with a historical summary of the discovery of artificial fertilisers and passing reference was made to the contributions of notabilities such as Home, Wallerius, Priestly, Senebier and Saussure. The results of Boussingault which were elaborated by Liebig and Lawes, and culminated in the famous controversy were indicated as an example of the beneficial results of intelligent, if heated, argument. This section was concluded with a reference to the development of the potash and synthetic nitrogen industries. Three succeeding sections of the paper described in detail the functions and types of nitrogenous, potassic, and phosphatic fertilisers. The relevant Rothamsted results were quoted to substantiate the theories and views expressed. The manufacture of the principal fertilisers was then outlined and the ingenious adaptations of physico-chemical laws in the production of synthetic products were referred to in detail.

Fire at a Yorkshire Chemical Works

Large Quantities of Creosote and Naphthalene involved

A SPARK from welding operations dropping on to bags containing naphthalene salts is believed to have been the cause of a fierce fire which broke out at the works of the Mirvale Chemical Co., Ltd., Steanard Lane, Mirfield, on Saturday, March 25, and destroyed plant for the drying of chemical salts, three open settling tanks holding about 60 tons of creosote containing naphthalene, and a large quantity of naphthalene salts in bags. Four fire brigades—Leeds, Huddersfield, Dewsbury, and Mirfield—fought successfully to prevent the fire spreading to adjacent closed storage tanks, some of them containing creosote, and the fire, after raging for nearly eight hours, was overcome and extinguished shortly before five o'clock in the afternoon.

The fire originated in a new shed of the open, steel-girder, corrugated roof type, which was in course of construction over the settling tanks, and which contained new plant for the drying of chemical salts as well as naphthalene in bags. When

the bags burst into flames, workpeople used about three tons of chemical foam extinguisher in an endeavour to check the fire, and their efforts managed to keep it to the building in which it started before the supplies of foam were exhausted. In a short space of time the shed and its contents and the chemical mixture in the settling tanks was a raging furnace belching forth flames and dense black smoke, while burning streams of molten naphthalene ran over the yard. Within three-quarters of an hour the four fire brigades had arrived and began a desperate struggle to stop the fire extending to adjacent storage tanks. Chemical foam was again utilised with some effect on the fire itself, but work was chiefly directed to confining the outbreak, which finally burnt itself out.

During the course of the fight walls of cinders were built to keep back the molten naphthalene. In their work the firemen were assisted by an east wind blowing away from the storage tanks they worked so hard to save.



[Photo by courtesy of The Yorkshire Post

Four fire brigades were at work at the fire which occurred on March 25 at the works of the Mirvale Chemical Co., Ltd., Mirfield

This Spending Push

By Sir Ernest J. P. Benn

PROPOSALS for a campaign of spending by Government and local authorities are being recommended to us in conjunction with the suggestion that taxation should also be reduced. Responsible people who ought to know better make the definite suggestion that the Chancellor should at the same time increase his liabilities and reduce his revenues. Highly technical questions are involved in matters like the Sinking Fund, and the danger must be avoided of confusing the issue by allowing the experts to monopolise the discussion on what is after all a detail. I am not in Mr. Chamberlain's confidence, but I have a higher opinion of him as a financier than to credit him with miracles or to believe that he will descend to tricks. If the estimates which a negligent Parliament has now passed mean anything, they mean that a reduction of taxation is out of the question. Dishonesty is, therefore, not too strong a term to describe proposals which are bound to make a strong sentimental appeal to a distracted and distressed people, and which are founded upon the wholly false hope of an immediate reduction of the demands of the Exchequer upon the taxpayer.

There is in these schemes still another definite departure from the path of rectitude and honesty, and it must always be remembered that our public finance depends upon rectitude more than upon figures. The suggestion is that while we are collecting vast sums of capital as death duties, taxation on reserves, and in other ways, which we are spending as if it were income on doles and current expenses, we can incur further expenses on capital account with an easy conscience. It is as if an individual were to sell his securities and live upon the proceeds, and then raise further capital upon some supposed reversionary interest, the reversionary interest in the case of the Chancellor of the Exchequer being no more substantial than the vague hope that future generations will recognise the obligation.

The Inability of Public Authorities

Business people will be wise to approach this spending push from yet another point of view. They must remember that there has arisen since the war a new trade or profession concerned with planning. This new trade offers new prospects to the professional and bureaucratic class. Whereas tradition has put a limit in the neighbourhood of a couple of thousand a year upon the income of a public servant, the planners through all sorts of new semi-public corporations are offering prospects of seven and ten thousand a year. When, therefore, we are considering some new scheme, may be for a world currency or a housing corporation, it is wise to remember that the proposers of such schemes are in the same class as the drapers, and their pronouncements should be read with the same critical eye that is used in scanning the draper's catalogue. There is no doubt in many of these plans a genuine desire to solve the public difficulties, but there is also present in most of them a tempting prospect of lucrative employment for the persons who make the proposals.

This push for public spending may surely be described as a campaign to wash away the floods by turning on the rain. Our economic troubles, and they are not to be underestimated, arise from one cause and one cause only, namely, the financial operations of governments and public authorities. There is no other explanation possible or necessary. Private enterprise has provided since the war alone £25,000,000,000 in rates and taxes for purposes such as are now advocated, and a very large part of this gigantic total has been collected and spent by governments and planners to relieve us of unemployment. The result is, as we know to our cost, that we have more unemployment than ever. The position viewed as a whole and judged correctly discloses two big, clear, simple facts. First, the strength, the quality and the wonderful abilities of the citizens of this country to carry on and function and provide. Next, the total inability of public authorities to do anything but destroy credit, confidence and trade. Having, therefore, had all the experience we want of schemes for making us prosperous through the agency of public authority, we can now determine that however many professors may produce abstruse arguments to the contrary, we will have no more.

Lord Melchett and Unemployment

Plea for Remission of Taxation

REPLYING to the toast of "Industry and Commerce" at the annual dinner on March 24, of the Plymouth Incorporated Mercantile Association, at which he was the principal guest, Lord Melchett, of Imperial Chemical Industries, Ltd., said that he believed the solution of European problems could only be arrived at by a United States of Europe. At the same time he did not think it was their job to create that United States, but he believed it was their job to develop the British Empire. He was not one who believed in decrying the position of the country, or the Government of the country, but they must realise that, for example, the shipping industry was in great distress. It was faced with competition from other parts of the world, and, moreover, from foreign Governments. Foreign lines were receiving some form of subsidy, and while it might not be untrue that an individual shipping company could not keep its end up against foreign competition subsidised by foreign governments, there was no doubt that if British people said they would support the shipping industry they could as a nation easily do it. He believed there was no objection to a Government affording that assistance to one of the really vital industries of the nation on which they as an island people depended, and that the British people as a whole would support the present Government in any reasonable assistance to the shipping industry to help it through its present difficulties.

Products of Science

Speaking on unemployment, Lord Melchett referred to the Chancellor of the Exchequer's recent statement that it would probably remain for a decade. He did not think the Chancellor overstated the case. Science had produced two things for mankind. The first was comfort and the second was leisure. Curiously enough they were the two things they had been struggling for, but they had come so quickly and suddenly that they had tended to destroy the economic system which existed to-day. It was surely better to distribute the work and the leisure than to force three million men into idleness, and employ the balance of the population at a rate of work which left them about a fortnight per year to rest from their labours. Although science had produced plenty of leisure it had not given them the means of organising them in such a way as to obtain the benefits they might obtain from those great blessings. He did not believe that a return of comparative prosperity would solve the unemployment problem. He suggested that the time had come when they had to regard the leisure created by science as a positive benefit, instead of a great injury. If they only learnt so to organise their affairs that unemployment was grouped in such a way that a man had a large amount of leisure at one time he believed that leisure could be used to develop that individual, to educate him, to advance him morally and intellectually, in a way that had never before occurred in the whole history of the human race. Anyone who pinned faith to economic conferences and monetary agreements was pinning faith to a mere illusion, and it would be safer for them to try to find some way within their own control to solve the difficulties. If the Government had the courage to embark on a good substantial progressive campaign of loan expenditure for constructive work, and, at the same time, took a really sporting gamble on the remission of taxation, they would see this country forge ahead.

Spanish Paint and Varnish Trade

SPAIN is well adapted to the production of paints and varnishes inasmuch as important quantities of naval stores and some pigments are produced annually. It is estimated that from 50 to 75 per cent. of ready-mixed paints normally consumed in Spain are produced by domestic manufacturers but with the fall in value of the peseta, this percentage has increased. Calcimines and other cold water paints are made by practically every domestic paint manufacturer and a small market is offered for foreign brands. About 75 per cent. of the requirements for nitro-cellulose lacquers are imported but owing to present conditions this quantity has decreased.

The Physical Society

Effects of Union with the Optical Society

At the annual general meeting of the Physical Society, held on March 17, the following officers were elected:—Professor A. O. Rankine (president), Professor W. Wilson (vice-president), Dr. Allan Ferguson and Dr. Ezer Griffiths (papers and business secretaries respectively), Professor O. W. Richardson (foreign secretary), Mr. R. S. Whipple (treasurer), Dr. J. H. Brinkworth (librarian), Professor E. V. Appleton and Drs. L. F. Bates and L. Hartshorn (new members of council).

The annual report of the council recorded with regret the deaths of Mr. A. C. G. Beach, Mr. Edwin Edser, Mr. St. George Lane Fox-Pitt, Mr. William Francis, Mr. H. Chapman Jones, Professor R. L. Jones, Mr. J. Saynor, Mr. W. S. Seaton, Sir Richard Threlfall and Mr. G. Fergus Wood. The report stated that the outstanding event of the year had been the union of the Optical Society with the Physical Society of London. This step was desirable on various grounds and after full consideration of the financial, legal and other considerations involved, the councils of the two societies unanimously decided to recommend an amalgamation. This recommendation was put to the test of a post-card vote and was carried by an overwhelming majority. The necessary legal business had been successfully carried through, and the fusion of the two societies under the title of "The Physical Society"

had been completed. The Physical Society had entered upon this term of its existence with a largely extended membership and corresponding increased obligations. Those activities which were specially characteristic of the parent societies would be consistently continued. The Guthrie lecture and the Thomas Young oration would be delivered at regular intervals; the "Proceedings" would be issued in six parts per annum instead of five and the council had in contemplation the production at regular intervals (probably annually) of a series of reports on the state of physical science.

The report added that during the year considerable progress had been made by the joint library committee set up some time ago by the Institute of Physics, the Physical Society of London, and the Optical Society. The main part of the joint library was now housed in some rooms at the Institute of Physics which had been comfortably furnished for use as reading and writing rooms. These rooms were opened by Lord Rutherford in May, 1932. A number of periodicals were already available for reference and a nucleus of textbooks and works of reference were also available. The total membership of the Society had increased from 842 to 964 during the last year. This increase of 122 was due mainly to the transfer of 136 members from the Optical Society.

Chemical Industry Lawn Tennis Tournament

Entries to be Received by May 1

THE announcement in THE CHEMICAL AGE last week that the Chemical Industry Lawn Tennis Tournament which was so successful in 1932 is to be repeated this year, and is to be extended to include men's singles, has been received with enthusiasm by tennis players in the industry, and judging from the applications already received for entry forms there are prospects of a substantial increase in the number of competitors. The tournament comprises men's singles and men's doubles and is open to all engaged in any capacity, either as a principal or a member of a staff, in the chemical industry. The only restriction is that in the case of men's doubles, each pair must comprise members of the same or an associated firm.

Last year, when the tournament was confined to men's doubles, entries were received from 46 pairs, representing about 20 firms. Most of the entries came from the London area, but there were a number from the provinces, and we hope this year to see a much larger proportion from outside London. For the early rounds of the tournament, the country will be divided into areas so that travelling difficulties may

be minimised as far as possible. THE CHEMICAL AGE Silver Challenge Cup is at present held by W. Speakman and S. E. Chaloner, of the Monsanto Chemical Works, Ltd., Ruabon, North Wales, who defeated G. F. Hammond and L. Giltrow, of Williams (Hounslow), Ltd., in the final at Oxted last September. This cup will again be awarded to the winners of the men's doubles, and there will be a similar trophy for the winner of the singles. Precise details of the trophies will be announced later, but it should be mentioned that two cups have already been offered, one from Mr. W. Lloyd-Willey and another from his firm, Thomas Hill-Jones, Ltd., to be called the "Invicta" Cup.

In order to allow time for the playing off of the various rounds, it is desirable that entries should be sent in as early as possible, so that the draw may be completed immediately after the closing date. Entry forms may be obtained from the Editor of THE CHEMICAL AGE, Bouverie House, Fleet Street, London, E.C.4, and entrants are reminded that the last date for entries is May 1. Attention is again called to the simple rules governing the tournament.

Rules

1. Every competitor must be a member of the chemical industry, either as a principal or a member of a staff. There is no entrance fee of any kind.
2. Each pair in the Doubles Tournament must be members of the same, or an associated, firm.
3. The Challenge Cups shall be competed for annually on courts of any surface in accordance with the Rules of Lawn Tennis and the Regulations of the Lawn Tennis Association. The winners of the Cups shall make arrangements for their safe custody and insurance.
4. 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.
5. Entries shall be made not later than May 1, 1933, and addressed:

"Lawn Tennis Tournament,"
"The Chemical Age,"
Bouverie House,
Fleet Street, London, E.C.4.
6. The draw shall be made on the first convenient day following the close of entries. The dates on or within which the several rounds must be played will be published in THE CHEMICAL AGE.
7. 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.
8. 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.
9. In the general interests of competitors throughout the country it has been decided to divide into areas as far as possible all matches up to, and including, the Semi-Finals, the rule as stated under Clause 8, however, still standing.
10. 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.
11. 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.
12. 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.
13. 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.

Drums for the Chemical Manufacturer

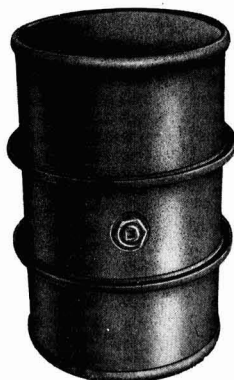
How a Well-known Maker is Serving the Industry

FOR many years past the manufacture of mild steel drums has been largely in the hands of Continental manufacturers, but during recent years Fredk. Braby and Co., Ltd., have established, at Aintree, Liverpool, a large works specially devoted to the production of this type of container. These works are equipped with the most modern plant available and as the railway vans, through their private siding, have direct entry into their works, they are in a position to rapidly produce and despatch many types of steel containers. When it is remarked that their daily output of the large type steel drum is upwards of 1,000 per day, it gives some indication of their resources.

The type of drum that possibly is of the greatest interest to the chemical manufacturer, is a welded drum with two heavy I-section rolling hoops on the body. Brabys designate this type of drum their "A" or "E" pattern depending on the actual method of construction. These drums are produced in many sizes ranging from 20 to 300 gallons capacity, in strengths of material varying from 20 gauge to $\frac{1}{4}$ in. plate. They can be finished (a) with the interior of the drum left in its mill finish, the outside being painted or unpainted, as

is held to the body by means of an external contracting band, which is tightened by means of a single screw and is very easily removed and re-fitted. About 5,000 of these drums, supplied to a well-known concern, have made three journeys to and from the Antarctic and the owners report that they are still in excellent condition. This type of drum can be supplied in the same finishes as the heavier drums previously mentioned. This drum, however, is not guaranteed to be liquid-tight; it is largely used for powders, greases and similar semi-solids.

The "One-Time-Shipper," as its name indicates, is a non-returnable package. The most popular size is 45/47 gallons capacity, this being equivalent to the standard American 55 gallon drum of the same type. The metal generally used is 18 gauge, both for the body and the ends. The body seam is welded, and the ends being secured to the body by the double seaming process. There are two pressed out rolling hoops in the body, and usually, four small corrugations between each rolling hoop and the end of the drum. The drum is usually fitted with 1 to 2 in. filling bung and 1 to $\frac{3}{4}$ in. bung for a draw-off tap, bungs being fitted with metal and



Type E



Type D



Type DRT

Some Typical Examples of Mild Steel Drums for Use in the Chemical Industry.

desired; (b) with the body galvanised inside and outside; (c) with the interior heavily tinned and the exterior painted; (d) rubber lined inside and painted outside; or (e) made from stainless steel sheets. Other special finishes are also produced to customer's specific requirements. Very particular attention is given to the testing of these drums, each drum being tested by air pressure when immersed in water. This method immediately indicates the slightest leak, and we are informed that one concern, which during the last few years have purchased over 100,000 Braby drums, have stated that the number about which they have had reason to complain, is less than one in ten thousand.

As many of the drums are somewhat expensive, a special feature is made of embossing on the ends of the drum, the name and address of the owner. An illustration of Braby's standard "E" type drum appears on this page.

Another type of container which is of particular interest to the chemical industry, is a drum with a detachable top. Braby's produce a number of drums of this type, the most popular being their "D.R.T." type. This drum, like the "A" and "E" types, can be offered made from varying thicknesses of material between the limits of 20 to 12 gauge. The body of the drum may be fitted with a standard I-section rolling hoop or the rolling hoops can be pressed out from the body. The bottom is secured to the body of the drum by welding or by the double seaming process, whilst the top of the drum is formed into a bead, approximately $\frac{3}{8}$ inch diameter. The loose cover is so made to fit neatly over this bead and is fitted with a moulded rubber packing ring. The cover

cork gaskets and arranged to seal. These drums are usually enamelled in standard colours, and if desired, the name of the firm together with their trade slogan, or other advertising matter, can be printed in colours on the ends. This makes a particularly attractive container of considerable advertising value and the present users consider it is well worth the small extra asked for this finish. The interior of each drum is guaranteed free from scale and other foreign matter, and each drum is individually tested to a pressure of 7 lb. per sq. in. and guaranteed not to leak.

Mining and Metallurgy

Institute Awards

THE Gold Medal of the Institution of Mining and Metallurgy has been awarded to Sir John Cadman, chairman of the Anglo-Persian Oil Co., in recognition of his work in the advancement of technical education and the development of the mineral industries. The following awards have also been made:— "The Consolidated Gold Fields of South Africa, Ltd." gold medal to Mr. Charles Arthur Banks, for his paper on "Air-Transportation of Gold Dredges in New Guinea"; "Gold Fields," premium of forty guineas conjointly to Mr. J. L. Francis and Mr. John C. Allan for their paper on "Driving a Mines Drainage Tunnel in North Wales"; and the "William Frecheville" students' prize of ten guineas to Mr. Gordon J. Williams, for his paper on "The Genesis of the Perrunal-La Zarza Pyritic Orebody, Spain."

News from the Allied Industries

Iron and Steel

SIR WILLIAM LARKE, secretary of the National Committee for the Iron and Steel Industry, states that the committee has put forward a scheme for reorganisation of the iron and steel industry to the Import Duties Advisory Committee for their comment. Pending consideration of the scheme, by the Import Duties Advisory Committee, it is naturally confidential, but the Import Duties Advisory Committee will doubtless authorise publication of the scheme in its final form.

Dyeing and Calico Printing

SHAREHOLDERS of the United Turkey Red Co., Ltd., of Glasgow, will be glad to learn that the prophecy by the chairman, Mr. Henry Christie, of better results for 1932 has been well fulfilled. Earnings available for distribution amount to £58,503, against only £2,758 in 1931 and £4,315 in 1930. This enables the preference dividends to be paid once more out of current earnings, and would have covered a small dividend on the ordinaries also, but £23,295 has been transferred to make good last year's depletion of the first preference reserve instead.

Artificial Silk

SINCE ITS FORMATION IN 1925 the British Enka Artificial Silk Co. has encountered many difficulties. Heavy losses have been incurred, and no dividend has yet been paid on the issued capital of £1,250,000. In 1931, however, results were more satisfactory, a working profit of £34,546 being recorded, while the company's plant was being worked to capacity. A working profit of £30,463 is shown, but after allowing for debenture interest and depreciation, and placing £8,172 to reserve for losses on exchange, there is a net loss of £85,502. This compares with a net loss of £78,279 reported for 1931, and increases the debit balance at profit and loss account to £569,988. Patents, processes and other rights are now valued at £146,445, compared with £145,749 a year ago, while stocks have risen from £118,406, to £171,281.

Non-Ferrous Metals

SEVERAL IMPORTANT CONCLUSIONS are to be drawn from Mr. Robert C. Stanley's speech at the meeting of the International Nickel Co. held in Toronto on March 28. First, the economies which have allowed the company to meet the great fall in demand without serious cash loss are likely to be permanent, since they derive not only from reduced pay and reduced staff, but also from the cheaper working which is made possible by improvements under the 1926-32 development scheme now complete. Secondly, during the depression, the company has been able to broaden the basis of its sales, though it has not avoided a steep fall in their volume. Thirdly, Empire and other markets for the company's copper have been found to replace the United States market now isolated by its 4 per cent. tariff. And, fourthly, the fall in prices of platinum metals has not yet brought the price nearly down to the company's by-product production costs.

Paper

A SATISFACTORY REPORT on operations during the year ended December 31 last is issued by the directors of Bowater's Mersey Paper Mills, Ltd. Trading profits amount to £97,575, which compare with £47,570 for the first accounting period of fourteen months, and, after providing for debenture interest, net earnings have increased from £564 to £54,325. During the year the issued capital was raised from £400,000 to £1,000,000 by the issue of 100,000 ordinary shares and 500,000 preference shares, while since the date of the balance-sheet the directors have taken advantage of the favourable monetary conditions to replace £650,000 of 6½ per cent. debenture stock with an issue of £800,000 of 4½ per cent. stock. The new capital was raised for the purpose of providing the necessary finance for the installation of two further newsprint machines. It is anticipated that these machines will be completed by the end of the year, when the output capacity of the mills will be 120,000 tons of newsprint paper per annum. Production of the two machines already installed having reached a satisfactory level, the current year has opened under favourable conditions.

Petrol

IN THE HOUSE OF REPRESENTATIVES at Canberra, on March 22, Mr. Latham, the Attorney-General, announced that the Australian Government had decided to appoint a Royal Commission to inquire into the petrol industry. The decision follows the refusal of the principal oil companies to furnish the Government with information on distribution and other costs in Australia.

London Chemical Works Explosion One Killed : Several Injured

AN extensive area of South London was shaken by an explosion which occurred early on Thursday morning at the synthetic chemical works of W. J. Bush and Co., Ltd., Batsworth Road, Mitcham. So far as could be ascertained at the time of going to press, one person, a boy of 14 living in a flat near the works, was killed, and about 30 were injured, most of them children living near by. According to a statement made to the Press by Mr. Priest, manager of the works, there were ten men on the premises at the time of the explosion. They were working extra time, and starting at 6 a.m. Mr. Priest was of the opinion that the first explosion occurred in a shed. Some inflammable vapour apparently escaped, but how it became ignited was unknown.

The first warning of the explosion was the blowing up of a storage tank of methylated spirit. Clouds of steam and smoke prevented anyone getting near for a quarter of an hour. Then the whole shed blew up, the whole of the roof being wrecked. Four men—E. D. Dawson, F. Caplin, G. Smith and J. Orfeu—who were at work at the time, were removed to hospital. Over 200 houses in Rock Terrace, near the works, were damaged, and the fronts of six shops and a public-house were blown in. A fire followed the explosion, which was extinguished by the Mitcham and Wimbledon fire brigades.

Windows of houses as far away as Merton were damaged by the force of the explosion, and the sound was heard over a radius extending to Dulwich, Penge, Streatham and Tooting.

A New Type of Leather Research at Mellon Institute

THE Mellon Institute of Industrial Research, Pittsburgh, has announced the successful completion of an investigation by Mr. C. H. Geister which is expected to be of great importance in the leather and shoe industries. This achievement is said to be the most outstanding scientific development in this field since R. H. Foerderer created vici about 1880. At a certain point in the vici method, a marked departure is taken from the usual treatment by impregnating the skin with an entirely new combination of materials. In this way the fibres are supported and lubricated, inhibiting their breaking down under wear—the cause of some leathers losing their shape.

An important advantage of the new leather to the shoe manufacturer is that shoes fashioned from it require no dressing. When the shoes are completed, a buffer and friction brush bring out a rich finish of any desired brilliance. Furthermore, having no hard surface, the skins can be worked without the usual danger of shoe factory damage, greatly simplifying handling throughout the process of shoe manufacture. The feature of this new leather that probably will be of most interest to the consumer is the permanence of its finish. The heat of the foot gradually but constantly encourages the impregnating materials to the surface, thus maintaining a lubricant on the grain which requires only a slight rubbing to preserve the desired polished effect. The impregnation also adds to the leather's water-resisting quality. This method does away with the cracking common to leathers finished with hard surface dressings that powder and fly with wear. All colours are said to be more permanent than is the case with hard-surface finish leathers because the colour, like the finish, is constantly revitalised by the material with which the skin is impregnated.

International Oil Industries Prospectus of Exhibition

THE International Oil Industries Exhibition will open in the main hall of the Royal Agricultural Hall, London, on July 19 and continue until July 25. Star showmen "behind the scenes" are already planning to make this show the most spectacular the oil industry has ever known in this or any other country, and fully 15,000 people are expected to view the exhibition daily. Manufacturers of oil production plant will be given an opportunity of demonstrating the advances made in recent years in supplying equipment to meet the requirements of improved oilfield and refinery technique and the insistent demand for more and more economical production methods. They will be enabled to study more closely the latest developments in the laboratory or full-scale operations and make practical arrangements to supply these new demands. Adequate steps are being taken to give the general public, industrial corporations and public bodies opportunities of investigating the possibilities of oil in connection with their respective needs, and to put before them by exhibits, films and demonstrations the advantages, from the economical and general efficiency points of view, of using oil products whenever possible. The Institution of Petroleum Technologists has extended its support to the exhibition and is holding a world petroleum congress contemporaneously with the exhibition.

A prospectus has recently been published containing rules and regulations and an agreement form to be filled up by those who intend to exhibit. Applications for space will be dealt with in strict rotation and early application is advised. This prospectus and any other information may be obtained from the Secretary, The International Oil Industries Exhibition, 5 Devonshire Street, Portland Place, London, W.1.

Plastics Industry Exhibition Forthcoming Display at South Kensington

NEARLY 80 industries, most of them of post-war birth, will be represented at the exhibition of plastic materials and their products, which will be opened by Lord Irwin at the Science Museum, South Kensington, on Wednesday, April 5. More than 1,000 exhibits will occupy the vestibule and the third floor, chiefly Gallery 66, from which the chemical collections have been temporarily withdrawn. The display has been arranged by the Plastics Group of the Society of Chemical Industry in conjunction with the British Plastic Moulding Trade Association and the Department of Scientific and Industrial Research.

The exhibition has a twofold object, in that it aims at securing the interest both of the general public and of industrial concerns. The general visitor will be catered for particularly in the entrance hall on the ground floor, where there will be arranged, among other exhibits, a "synthetic wood" table derived from coal tar, "synthetic china" vessels from cellulose and "ivory combs" from casein. On the more technical side of the exhibition in the upstairs gallery, more serious visitors will be able to trace the development from the earliest raw material in each type of manufacture, through the intermediates to the finished moulding powder or sheet that forms the boundary between the chemical and the more mechanical side of the work. Machinery employed in converting plastics into the final products will be illustrated and there will be a press in use turning out article of everyday appearance. There will be a specially designed room where the new technique of using laminated plastic sheets is illustrated on an imposing scale. In this room the panelling, door and other effects will be carried out entirely in laminated material.

A Series of Lectures

A series of lectures by experts will be given during the exhibition, the first of which, "Plastics and What They Are," is to be given by Mr. H. V. Potter, chairman of the Plastics Group of the Society of Chemical Industry, on April 12. This will be followed by others including—April 19, A. J. Gibson, "Plastics—Shellac and Natural Resin Types and

their Uses"; April 26, Foster Sproxtton, "Plastics—Celluloid and Casein Types and their Uses"; May 3, Kenneth M. Chance, "Plastics—Urea Formaldehyde Types and their Uses"; May 10, Major H. C. Parker, "Plastics and the Fabricator"; May 17, Dr. L. A. Jordan, "Plastics—Their Use in the Paint Industry"; May 26, Professor C. S. Gibson, "Plastics—Their Use in Dentistry"; May 31, Professor G. T. Morgan; June 7, George Dring, "Plastics—The Phenolic Types and their Uses"; June 14, Dr. Jenkins, "Cellulose Esters and Ethers and their Uses"; June 21, Raymond McGrath, "Plastics and the Architect."

The exhibition will be open daily from 10 a.m. till 6 p.m. and admission is to be free.

Prices of Chemical Products Current Market Conditions

THE London chemical market remains quiet, without any special feature. Values are practically unchanged. Moderate business activity has been reported on the Manchester chemical market during the past week, but there is still a pronounced reluctance on the part of most buyers to enter into contracts very far ahead. Deliveries against commitments to the users allied to the textile trades are on a fairly satisfactory scale considering the conditions in the cotton industry. On the whole, chemical prices maintain a steady front and fluctuations during the past week have been limited both in number and extent. The past week has shown a continued improvement in the Scottish heavy chemical market. With the following exceptions, the prices of all chemical products remain as reported in THE CHEMICAL AGE last week (pp. 274-275).

General Chemicals

ACID, CITRIC.—LONDON: 10d. per lb.; less 5%. MANCHESTER: 9½d. to 10d.
ARSENIC.—LONDON: £22 14s. c.i.f. main U.K. ports for imported material; Cornish nominal, £23 f.o.r. mines. SCOTLAND: White powdered, £27 ex wharf; spot, £26. MANCHESTER: White powdered Cornish, £23 10s. at mines.
POTASH, CAUSTIC.—LONDON: £42. MANCHESTER: £40 to £41.
POTASSIUM PRUSSIATE.—LONDON: 8½d. to 9d. per lb. SCOTLAND: Yellow spot material, 8½d. ex store. MANCHESTER: Yellow, 8½d.
SODIUM PHOSPHATE.—£12 10s. per ton.
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.
SULPHATE OF COPPER.—MANCHESTER: £15 10s. per ton f.o.b.

Pharmaceutical and Fine Chemicals

MENTHOL.—A.B.R., recryst. B.P., 15s. 6d. per lb.

Essential Oils

ARAUCARIA.—9s. per lb.
BERGAMOT.—6s. 9d. per lb.
BOURBON GERANIUM.—26s. per lb.
CAMPHOR, BROWN.—85s. per cwt.
CINNAMON.—4s. per lb.
LAVENDER.—Mont Blanc, 38/40%, 10s. 6d. per lb.
LEMON.—4s. 3d. per lb.
LEMONGRASS.—2s. 10d. per lb.
ORANGE, SWEET.—6s. per lb.
PEPPERMINT.—Wayne County, 14s. per lb.
PETTIGRAIN.—6s. per lb.
SANDALWOOD, 90/92%,—20s. per lb.; Australian B.P., 92/95%, 16s. per lb.

Coal Tar Products

ACID, CRESYLIC.—99/100%, 11d. to 1s. 8d. per gal.; pale 95%, 11d. to 1½d.; 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.
CREOSOTE.—B.S.I. specification, 2½d. to 3d. per gal. LONDON: 3d. to 3½d. f.o.r. North; 4d. to 4½d. London. MANCHESTER: 2½d. to 3½d. SCOTLAND: Specification oils, 3½d. to 4½d.; washed oil, 4d. to 4½d.; light, 3½d. to 4½d.; heavy, 4½d. to 5d.
PITCH.—Medium soft, £4 10s. per ton. MANCHESTER: £4 2s. 6d. to £4 7s. 6d. f.o.b. LONDON: £4 5s. to £4 10s. f.o.b. East Coast port.

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.

Applications for Patents

PREPARATION OF OIL-SOLUBLE HARDENING PHENOL ALDEHYDE RESINS. J. Ehrenfeld, H. Hönel and Beck, Koller & Co. March 22. (Austria, Aug. 30, '32.) 8693.

PRINTING VAT DYE-STUFFS.—Bleachers' Association, Ltd. March 21. 8460.

RESISTING ALKALINE DYEING LIQUORS.—Bleachers' Association, Ltd. March 21. 8461.

MANUFACTURE OF *p*-ALKOXYPHENYL-BENZO-QUINONE-MONOIMINES.—A. Carpmael (I. G. Farbenindustrie). March 20. 8424.

MANUFACTURE OF OXYGENATED ORGANIC COMPOUNDS.—H. Dreyfus. March 23. 8763.

MANUFACTURE OF SYNTHETIC RESINOUS COMPOSITIONS.—E. I. Du Pont de Nemours & Co. March 21. (United States, March 21, '32.) 8578.

MANUFACTURE OF CELLULOSE NITRATE.—Du Pont Viscoloid Co. March 25. (United States, March 25, '32.) 9056.

MANUFACTURE OF PHENOLS FROM ALKALI ARYLSULPHONATES.—L. S. E. Ellis (Soc. des Usines Chimiques Rhône-Poulenc). March 20. 8432.

MANUFACTURE OF IRREVERSIBLE BITUMINOUS EMULSIONS.—W. W. Groves (I. G. Farbenindustrie). March 20. 8382.

MANUFACTURE OF DYES, &c.—I. G. Farbenindustrie. March 20. (Germany, March 18, '32.) 8381.

SEPARATING PHOSPHORIC ACID FROM MIXED RARE-EARTH SULPHATES.—I. G. Farbenindustrie. March 20. (Germany, April 25, '32.) 8404.

PRODUCTION OF DILUTE ACIDS.—I. G. Farbenindustrie. March 22. (Germany, March 24, '32.) 8680. (Germany, June 9, '32.) 8681. (Germany, Oct. 20, '32.) 8682.

MANUFACTURE OF HALOGENATED ETHANOLS. I. G. Farbenindustrie. March 22. (Germany, March 23, '32.) 8702.

MANUFACTURE OF 4-AMINO-1:8-NAPHTHALENE-DICARBOXYLIC ACID IMIDE, &c.—I. G. Farbenindustrie. March 24. (Germany March 24, '32.) 8953.

MANUFACTURE OF SULPHURIC ACID ESTERS OF LEUCO ANTHRAQUINONE AZINES.—I. G. Farbenindustrie. March 25. (Germany, March 26, '32.) 9067.

MANUFACTURE OF 1,4-DIAMINOANTHRAQUINONE-2,3-DISULPHONIC ACID. I. G. Farbenindustrie. March 25. (Germany, March 26, '32.) 9068.

MANUFACTURE OF COLOURING MATTERS.—Imperial Chemical Industries, Ltd. March 22. 8691.

MANUFACTURE OF β ANTHRAQUINONE DERIVATIVES.—Imperial Chemical Industries, Ltd. W. W. Tatum and R. F. Thomson. March 22. 8692.

DYESTUFF INTERMEDIATES, &c.—Imperial Chemical Industries, Ltd.—March 23. 8834.

OBTAINING ALKALINE HYDRATES FROM SILICATES.—F. Jourdan. March 20. (Italy, March 18, '32.) 8365.

TREATMENT OF SILICATES WITH ACID.—F. Jourdan. March 20. (Italy, March 18, '32.) 8366.

MANUFACTURE OF SULPHATE OF ALUMINA.—Kalanite Co. March 21. (United States, April 23, '32.) 8570.

MANUFACTURE OF BASIC ALUM.—Kalanite Co. March 21. (United States, April 22, '32.) 8571, 8573.

MANUFACTURE OF ALUMINA.—Kalanite Co. March 21. (United States, April 22, '32.) 8572, 8574.

METHOD OF ELIMINATING IRON FROM SULPHATE SOLUTIONS.—Kalanite Co. March 21. (United States, April 22, '32.) 8575.

MANUFACTURE OF A GAS LOW IN HYDROCARBONS.—Power-Gas Corporation, Ltd. March 25. 9042.

EXTRACTION OF ACIDS, &c., FROM AQUEOUS SOLUTIONS.—Produits Chimiques Pura Soc. Anon. March 20. (June 23, '31.) (France, June 28, '30.) 8380.

MANUFACTURE OF MATERIALS CONTAINING POLYMERIZATION PRODUCTS OF ACRYLIC ACID, &c.—Röhm & Haas Akt.-Ges. March 23. (Germany, March 23, '32.) 8811.

MANUFACTURE OF 3-METHYLAL-3-OXYMETHYL-*n*-PENTANE.—Dr. A. Wacker Ges. für Elektrochemische Industrie Ges., March 21 (Germany, April 13, '32.) 8530.

Specifications Accepted with Dates of Application

SOLIDIFICATION OF CARBON DIOXIDE.—F. H. Foster and W. C. Priestley. Aug. 13, 1931. 389475.

PROCESS FOR THE MANUFACTURE OF DISINFECTANTS.—A. Carpmael (I. G. Farbenindustrie). Aug. 15, 1931. 389514.

POLYMERIZATION OF ESTERS OF OLEFINEDICARBOXYLIC ACIDS.—E. I. DU Pont de Nemours & Co. and H. B. Dykstra. Sept. 8, 1931. 389467.

REMOVAL OF PYRIDINE OR OTHER NITROGENOUS BASES FROM PHENOLS. J. Y. Johnson (I. G. Farbenindustrie). Sept. 11, 1931. 389517.

PROCESS FOR REMOVING TARTARIC ACID AND TARTRATES FROM GRAPE JUICE, MUST, AND WINE.—Vineyardists, Inc. Sept. 20, 1930. 389482.

PRODUCTION OF BENZOYL-BENZOIC ACID AND ANTHRAQUINONE DERIVATIVES.—Imperial Chemical Industries, Ltd., C. Shaw, G. C. Sempie, and R. F. Thomson. Sept. 17, 1931. 389507.

PRODUCTION OF FERTILISERS.—A. J. Prince and Imperial Chemical Industries, Ltd. Sept. 17, 1931. 389508.

PROCESS OF PRODUCING β -AMINOARYL MERCAPTANS AND DERIVATIVE THEREOF. E. I. Du Pont de Nemours & Co. Sept. 17, 1930. 389511.

SMELTING SULPHIDE ORES TO RECOVER ELEMENTAL SULPHUR THEREFROM.—R. F. Bacon. Sept. 26, 1930. 389520.

MANUFACTURE AND PRODUCTION OF ASSISTANTS FOR THE TEXTILE AND ALLIED INDUSTRIES.—J. Y. Johnson (I. G. Farbenindustrie). Sept. 28, 1931. 389543.

MANUFACTURE OF SULPHURISED DYESTUFFS AND THEIR APPLICATION.—Soc. of Chemical Industry in Basle. Oct. 24, 1930. 389555.

CATALYTIC HYDROGENATION OF CARBOACEOUS MATERIALS.—Chemical Reactions, Ltd. (Deutsche Gold und Silber-Scheideanstalt vorm. Roessler). Nov. 11, 1931. 389560.

PROCESS FOR THE MANUFACTURE AND PRODUCTION OF INTERMEDIATES AND DYESTUFFS OF THE ANTHRAQUINONE SERIES.—J. Y. Johnson (I. G. Farbenindustrie). Nov. 25, 1931. 389568.

FERTILIZER AND PROCESS FOR THE MANUFACTURE THEREOF.—Directie van de Staatsmijnen in Limburg. Jan. 12, 1931. 389595.

PROCESS OF NEUTRALISING ACID OR ALKALINE CONSTITUENTS IN A GAS.—W. C. Holmes & Co., Ltd., C. Cooper, and D. M. Henshaw. Jan. 8, 1932. 389601.

MANUFACTURE OF ETHER DERIVATIVES OF CARBOHYDRATES, PARTICULARLY CELLULOSE.—C. F. Burgess Laboratories, Inc. Aug. 14, 1930. 389534.

MANUFACTURE OF DYESTUFFS.—Soc. of Chemical Industry in Basle. Oct. 12, 1931. 389758.

PROCESS FOR PRODUCING CHEMICAL REACTIONS FROM GASES AND VAPOURS WITH AID OF A HIGH TENSION ELECTRIC ARC.—Soc. of Chemical Industry in Basle. Oct. 16, 1931. 389761.

International Paint & Compositions

A Highly Successful Year

SIR GEORGE M. W. MACDONOCH, presiding at the twenty-fifth annual meeting of the International Paint and Compositions Co., Ltd., held in London on March 24, said that the unprecedented trade depression had become worse rather than better in 1932. In spite of that he was able to congratulate the shareholders on a highly successful year, their net profits of £102,361 having only twice been exceeded in the history of the company. The net profits showed an increase of £11,997, which was considered to be very satisfactory.

The company was always conscious of the interdependency of each country on every other. Unsatisfactory conditions in any considerable area were bound to react elsewhere. In spite of the apparent lack of freedom from depression, Sir George said that there were better times approaching; one reason was that the firm seemed to be on the eve of improvement in America in spite of oppressive taxation, war debts, etc. There was a distinct improvement with regard to the shipping industry. As a result, the United Kingdom had had many orders placed in its dockyards. Although the company had chiefly concerned itself with shipping and had built up a good reputation for producing ship paint, it had steadily developed its industrial and domestic trades both at home and abroad.

Owing to the loyal co-operation of their employees they had succeeded in keeping their costs at the same low figure as in the previous year. In normal times they would have liked to take advantage of having £13,257 more available to pay an increased dividend on the ordinary shares, but they felt that, in the circumstances, the best interests of the shareholders would be served by adopting a cautious and conservative attitude, and they had decided to maintain the ordinary dividend at 9 per cent.

Oxy-Acetylene Welding Tips

The maintenance of reciprocating parts by bronze-welding is described in the March number of "Oxy-Acetylene Tips." The advantages are claimed to be many and the scope of the application is wide. The re-surfacing operation is described with the aid of diagrams. Another article of interest; on the lubrication of outdoor equipment, deals with the parts of a machine which ought to be well lubricated and the lubricating oils best suited for the work.

From Week to Week

RUTHS INTERNATIONAL ACCUMULATORS, LTD., announces that Dr. E. C. Weiss, LL.D., has been elected a director.

MR. P. J. PYBUS, M.P., has been reappointed a director of Associated Portland Cement Manufacturers following his resignation of the office of Minister of Transport.

A PETITION for the winding up of the Nor-Rust Liquid Lead Co., Ltd., will, according to a notice in the "London Gazette," be heard at the Royal Courts of Justice on Monday, April 3.

THE ANNUAL GENERAL MEETING of the Scottish Section of the British Association of Chemists will be held on April 21 in the Central Halls, Glasgow, at 7.30 p.m.

COLOUR HARMONY was the subject of a paper read before the Royal Society of Arts on March 29 by Mr. J. Littlejohns. The author pointed out the absurdity of the old theories of colour-balance and colour combinations, and closed with some remarks on the current principles of colour combinations.

THE ORDINARY SCIENTIFIC MEETING of the Chemical Society on April 6 will be devoted to the commemoration of Priestley's life and work. Papers will be communicated by Professor A. N. Meldrum, Sir Philip Hartog and Sir Harold Hartley, and there will be an exhibition of Priestley's relics.

MR. W. N. EINERT was to have read a paper on "A Review of Plastics Abroad" at a meeting of the Institute of the Plastics Industry on March 21, but he was unable to do so on account of indisposition. A substitute paper was given by Mr. W. Owen-Griffiths, on "Plastics Plant." Mr. Einert's paper has been postponed until next session.

THE SOUTHERN RHODESIAN GOVERNMENT has offered to purchase for £2,000,000 the British South Africa Company's mineral rights, subject to the ratification of Parliament. The company has accepted with certain reservations. Sir Henry Birchenough, the president of the British South Africa Company, said, on March 26, that he had known of this offer for the past fortnight, but at present he had nothing to say.

THIRTY-EIGHT EMPLOYEES of Chance and Hunt (Imperial Chemical Industries, Ltd.) were presented with long service awards on March 20 at Oldbury. Mr. W. A. S. Calder presided and Mr. J. G. Nicholson distributed the awards. Fourteen men had 49 years' service to their credit, 10 had 35 years, and 14 had 25 years; they received gold medals, gold watches, and silver watches respectively. On the retirement of Mr. H. Pearce, after 40 years' service in the secretarial department, he was presented with a silver tea service.

EVERY MOTORIST has experienced the inconvenience, not to say the expense, of having his engine decarbonised by the ordinary method of dismantling and cleaning, and any system which eliminates the need for mechanical treatment is to be welcomed. A simple and effective method of removing deposit overnight with the aid of a small quantity of methylated spirit is described in a booklet published by the Methylating Company, Kinnaird House, 2, Pall Mall East, London, S.W.1. Particulars of tests and some technical matter, with full directions, are given in the booklet, copies of which may be obtained on application to the Company.

THE INSTITUTE OF PHYSICS announces that the British Optical Instrument Manufacturers' Association prize for the best paper published in the "Journal of Scientific Instruments" during 1932 has been awarded to Mr. E. Lancaster-Jones, of the Science Museum, for his paper on "The Principles and Practice of the Gravity Gradiometer," and the Institute of Physics prize for the best contribution to the Laboratory and Workshop Notes in the Journal has been awarded to Dr. J. L. Miller and Mr. J. E. L. Robinson, of Ferranti, Ltd., for their joint note entitled "A Three-Dimensional Adjustment of an Electrode in Vacuo."

THE NATIONAL FEDERATION of Associated Paint, Colour, and Varnish Manufacturers has decided to renew its efforts towards securing the repeal of the hydrocarbon oil duty concerning white spirit and turpentine. In a circular to Members of Parliament, the Federation indicates that the turpentine tax is a direct burden on an essential raw material used in important industries, and that the white spirit duty is a direct tax on an essential raw material used in home industries. The circular states further that it is impracticable to obtain a refund on the white spirit in paints and varnishes used on articles made in this country and sent abroad, and that a large number of raw materials for paint manufacture have to be imported exclusively from foreign sources.

DR. L. G. PAUL, chairman, speaking on "Early Pioneers of the Huddersfield Chemical Industry" at the annual meeting of the Huddersfield section of the Society of Dyers and Colourists on March 21, said that the first chemist in the Huddersfield district was reputed to be John Nowell of Farnley (born 1794). Nowell was an intimate friend of John Dalton, and an acquaintance of Sir Humphrey Davy and Faraday. The next chemist was Read Holliday, a native of Bradford, who went to Huddersfield and began the distilling of ammonia from gasworks liquor. This was the beginning of the firm of Read, Holliday and Sons, which existed until the British Dyestuffs Corporation acquired it in 1915.

PRODUCTION OF SYNTHETIC NITROGEN in the Ruhr area was 62,316 tons less last year than in 1931.

A PAPER ON "The Sand Question in regard to Light Castings Production" was read last week to the Falkirk section of the Institute of British Foundrymen by Mr. F. Hudson, chief metallurgist of Glenfield and Kennedy, Kilmarnock.

MR. F. LUND, chief chemist and technical expert to R. and W. Watson, Linwood Paper Mills, Renfrew, has been appointed manager of Broughton Bridge Paper Mill in succession to Mr. T. O. Smith.

ACCORDING TO THE "LONDON GAZETTE," the Pendleton Oil and Chemical Co. Ltd. Croft Street Works, Pendleton, Manchester, resolved at a special meeting on March 14 that "the company, by reason of its liabilities, cannot carry on its business and that it be wound up."

MR. H. L. RICHARDSON, who has been manager of the Scottish branch of the Dunlop Rubber Co. for the past 25 years, has retired and was presented last week with a silver salver by his colleagues. He is being succeeded by Mr. C. W. Hyde.

MR. WILLIAM SCOTT BINGHAM, at his home, Ingleside, Wilderness Road, Plymouth, at the age of 71. Mr. Bingham was formerly managing director of the Millbay Soap Co., and was connected with the firm for nearly half a century. He retired from the post of managing director in 1925, owing to ill health. The interment took place at Efford Cemetery, Plymouth, last Tuesday.

THE PAPERS ON "Protein Swelling and Allied Phenomena," read at the conference of the British Section of the International Society of Leather Trade Chemists, held at the Leathersellers Hall in December last, are being reprinted in book form, including the introductory address by Professor F. G. Donnan. The book is of about 124 pages, and copies will be shortly obtainable from the offices of the Society at 17 Market Street, London, price 5s. 6d. post free.

INDUSTRIAL USES OF RUBBER LATEX was the subject of a paper given by Dr. D. F. Twiss at a joint meeting of the Yorkshire Section and the Plastics Group of the Society of Chemical Industry on March 27. The author pointed out that the realisation of the possibilities of latex from rubber manufacture was not really modern, but had been delayed through transport difficulties. With the availability of supplies of satisfactorily preserved latex there had been a rapid extension of the uses of latex for manufacturing purposes.

COAL-OIL MIXTURE in a colloidal form and the possibility of developing it was discussed by Commander H. D. Tollemache in a lecture to the South Wales Institute of Engineers on March 23. He expressed the opinion that the co-operation of the Fuel Research Board with the coal, oil, and shipping industries and the Admiralty, would soon bring about the successful development of colloidal fuel for commercial purposes, and place Great Britain in a leading position in this particular branch of fuel utilisation.

LONG SERVICE AWARDS were presented to 98 employees of the Imperial Chemical Industries, Ltd., by Dr. A. Fleck, managing director of the General Chemical Group, at Widnes on March 22. Chiming clocks for 50 years' service were given to four employees, gold medals for 40 years' service to 16 employees, gold watches for 35 years' service to 26 employees, and silver watches and medals for 25 years' service to 52 employees. In making the presentations, Dr. Fleck said that the company had passed through anxious times during the past year, but he hoped that the Widnes works would continue to go on from strength to strength.

Obituary

MR. A. G. JEYNES, for many years works manager to Ashmore, Benson, Pease and Co., Ltd., gas and chemical works plant manufacturers, of Stockton-on-Tees, aged 73.

HUGH CUMMING CLANAHAN, of Hale, suddenly on March 27 while playing golf. He had a serious illness at the end of 1931, but had recently been much improved in health and had resumed some of his public duties in the Altrincham district. Mr. Clanahan, who was a partner and director of the firm of Bayley, Clanahan and Co., chemical manufacturers' merchants, of Dickinson Street, Manchester, until his retirement at the beginning of this year, had been chairman of the Manchester Importers' and Exporters' Association for many years. He resigned from that position two years ago. He was 76 years of age.

Books Received

- The Chemistry of Drugs. By Norman Evers. London: Ernest Benn, Ltd. Pp. 256. 5s.
 Alfred Mond—First Lord Melchett. By Hector Bolitho. London: Martin Secker. Pp. 384. 21s.

Company News

Allied Chemical and Dye Corporation.—The regular quarterly dividend of \$1.50 has been declared.

British Drug Houses, Ltd.—The usual quarterly dividend of 14 per cent. on the preference shares, is announced.

Graphite Oils.—The report for the year 1932 shows a gross trading profit of £16,086; after deducting expenses, directors' fees, depreciation, etc., there is a loss of £6,988. There is now a balance remaining to debit of profit and loss account of £8,985, which it is proposed should be carried forward.

Wright, Layman and Umney (1932).—The accounts for the year 1932 show a trading profit of £52,731. The directors recommend a final dividend of 7½ per cent. on the ordinary shares, making 10 per cent. for the period since incorporation of the company. The sum of £17,500 is transferred to reserve, and £7,034 is carried forward.

Bede Metal and Chemical Co.—The report for the year 1932 states that the amount brought forward was £5,947. After transferring £10,000 from reserve and £4,335 from tax account, and writing off depreciation at Hebburn, also bad debts, etc., the loss was £360, leaving a balance to credit of profit and loss account of £5,586.

Briton Ferry Chemical and Manure Co.—After charging £1,011 for depreciation, the profit and loss debit is £11,782, which has been dealt with by transfer from reserve. The second year's instalment of the sum receivable under agreement with zinc smelters amounted to £12,123, and this has been written off property item in balance sheet as last year. The loan from the bankers has been repaid.

Canning Town Glass Works.—The net trading profit for 1932 was £23,059 against £20,827 in the previous year, to which is added the balance brought forward of £10,786, making £33,844. The directors propose writing down certain items included in buildings, plant and machinery by £1,000, transferring to depreciation reserve £2,500, and £5,000 to general reserve. To development account is added £2,500, and a dividend at the rate of 4 per cent. per annum, less tax, is declared payable on April 7, leaving to be carried forward £10,495. The annual meeting will be held at Winchester House, London, on April 6, at 12.30 p.m.

William Blythe & Co.—The net profit for the year 1932, including interest on investments, amounted to £23,052, against £23,233 in the previous year. Out of this there has been reserved for tax £2,280, and transferred to depreciation reserve £2,000, leaving £24,762, to which is added the balance brought forward of £5,995, making £30,757. The directors recommend a dividend of 10 per cent. actual (less tax) for the year 1932 on 880,400 ordinary shares of 3s. each, which will absorb £13,206; transferring to general reserve £5,000, leaving to be carried forward £1,664. The annual meeting will be held at 321 Royal Exchange, Manchester, on April 10, at 12 noon.

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).

Brazil.—A commission agent in Rio de Janeiro wishes to obtain the representation of an exporter of gumlac. (Ref. No. 481.)

Egypt.—A firm of general merchants and commission agents established in Cairo desires to obtain the representation of United Kingdom firms of pharmaceutical goods. (Ref. No. 479.)

New Zealand.—The British Trade Commissioner in New Zealand reports that the New Zealand Government Stores Control Board is calling for tenders, to be presented in Wellington by May 19, 1933, for the supply of approximately 5,000 gallons of disinfectant fluid. (Ref. F.X. 1730.)

New Chemical Trade Marks

Compiled from official sources by Gee and Co., Patent and Trade Mark Agents, Staple House, 51 and 52 Chancery Lane, London, W.C.2.

Opposition to the registration of the following trade mark can be lodged up to April 15, 1933.

Spartic. 539,117. Class 1. Zinc oxide. Sulphide Corporation, Ltd., Finsbury House, Blomfield Street, London, E.C.2. February 16, 1933.

Opposition to the registration of the following trade marks can be lodged up to April 22, 1933.

Crestalite. 538,274. Class 1. Pigments, paints and enamels (in the nature of paints). The Cookson Lead and Antimony Co., Ltd., Milburn House, Dean Street, Newcastle-upon-Tyne. January 14, 1933.

Plastogen. 538,204. Class 1. A chemical composition for use in compounding rubber in the course of manufacture. The Robert J. King Co., Incorporated, Sunnyside Avenue, Stamford, Connecticut, United States of America. January 12, 1933.

New Companies Registered

Dee Oil Company, Ltd. Registered March 17. Nominal capital £26,000 in £1 shares. To acquire the whole or any part of the undertaking of the Dee Oil Company, Ltd. (incorporated in 1894) and the liabilities thereof, to adopt an agreement with the said company and Wm. R. Ellis the liquidator thereof, and to carry on the business of manufacturers, refiners, blenders and merchants of oil, wax, paraffin, petroleum jellies, etc. Directors: Ernest Bateson, 2 Exchange Street East, Liverpool, J. C. P. Thompson, and C. P. Smith.

George & William Hargreaves, Ltd., 41 North John Street, Liverpool. Registered March 24. Nominal capital £1,000 in £1 shares. Soap and chemical manufacturers, etc. Directors: G. M. Hargreaves, J. I. Terry, and G. H. Taylor.

Hargreaves (Lively Polly), Ltd. Registered March 23. Nominal capital £10,000 in £1 shares. Manufacturers of soap and cleansing commodities now carried on by J. Hargreaves and Son, Ltd., at Liverpool, including various trademarks, and to carry on the business of soap makers and boilers, oil refiners and extractors, grease merchants and extractors, etc. Directors: C. A. Watson, The Temple, Dale Street, Liverpool, T. B. Greenwood, and B. Howard Baker.

Industrial Cellulose, Ltd., Botsford Street Works, Rutland Road, Sheffield. Registered March 24. Nominal capital £1,000 in £1 shares. Manufacturers of lacquers, varnishes, enamels, paints, chemical compounds, cellulose and cellulose products, etc.

Welsh Agricultural and Chemical Industries, Ltd. Registered March 23. Nominal capital £500 in £1 shares. Manufacturers of or dealers in fertilisers, artificial manures and chemical products, residues and bye-products of all kinds. A subscriber is Henry W. Faulkner, "Lyndhurst," Margaret Avenue, Shenfield, Essex.

Forthcoming Events

Apr. 3.—Society of Chemical Industry (London Section). "Modern Methods of Examining Pictures." Professor A. P. Laurie. 8 p.m. Burlington House, Piccadilly, London.

Apr. 4.—Hull Chemical and Engineering Society. Presidential Address. 7.45 p.m. Grey Street, Park Street, Hull.

Apr. 4.—The Institute of the Plastics Industry (London Section). "Moulding Plastics Progress, 1932-33." Rex Jones. 7.45 p.m. Windsor Castle Hotel, Victoria Station, London.

Apr. 5.—Institute of Fuel (N. Western Section). Annual general meeting reserved for the discussion of domestic matters and the communication of short papers. 7 p.m. Albert Square, Manchester.

Apr. 5.—Leicester Literary and Philosophical Society (Chemistry Section). Annual general meeting. 7.30 p.m. Museum, Princess Road, Leicester.

Apr. 5.—Society of Public Analysts. "Notes on the Iron and Copper in Liver and Liver Extracts." H. G. Rees. "The Determination of the Freezing-point of Milk." G. W. Monier Williams. "An Investigation of Solanine Poisoning." S. G. Willimott. 8 p.m. Burlington House, London.

Apr. 6.—Society of Chemical Industry (Food Group). Joint meeting with the Bristol Section of the S.C.I. "Problems of the Cider Maker." 7.30 p.m. University, Woodland Road, Bristol.

Apr. 6.—Society of Chemical Industry (Birmingham and Midland Section). Annual meeting. "Refractories." C. R. F. Threlfall and A. T. Green. 7.30 p.m. University Buildings, Edmund Street, Birmingham.

Apr. 6.—The Chemical Society. Ordinary Scientific Meeting. 8 p.m. Burlington House, London.

Apr. 6.—Business Research and Management Association of Great Britain. "Planning and Operating the Financial Budget." K. Perry Keene. 6.45 p.m. Anderson's Hotel, Fleet Street, London.

Apr. 6.—Society of Dyers and Colourists (West Riding Section). "Some New Results in the Photosynthesis of the Sugars." Professor E. C. Baly.

Apr. 7.—Society of Dyers and Colourists (Manchester Section). Annual Meeting. Short papers and discussion. 7 p.m. 36 George Street, Manchester.

Apr. 7.—The Physical Society. 5 p.m. Imperial College of Science, South Kensington, London.

Apr. 7.—Oil and Colour Chemists' Association (Manchester Section). Annual meeting and smoker.

Apr. 7.—Institution of Chemical Engineers, Chemical Engineering Group, and the Liverpool Section of the Society of Chemical Industry. Visit to the Central Electrical Power Generating Station, Clarence Dock. 2.45 p.m. "The Corner Metals of Electrical Distribution—Copper, Aluminium and Lead." F. J. Brislee. University, Liverpool. 6 p.m. Informal Dinner. University Club, Mount Pleasant. 8 p.m.

Apr. 7.—Society of Chemical Industry (Manchester Section). Annual General Meeting. 7 p.m. 17 Albert Square, Manchester.

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