The Chemical Age

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Notes and Comments

The Chemist in Industry

THE paper read by Dr. J. E. G. Harris before the Scottish section of the Institution of the Rubber Industry (THE CHEMICAL AGE April 1, p. 283) contains much that will repay careful study. His insistence upon the necessity for the chemist, and particularly the research chemist, to make a careful study of costs is timely even though it has been so frequently made before. It is rather astonishing that chemists do not take the repeated advice of those with wider experience and strengthen this weak link in their armour. One reason is the divorce between industrial chemistry and the teaching profession. It is nearly as difficult for an industrial chemist to enter the science staff of a school as for the camel to pass through the proverbial needle's eye. The embryo chemist consequently enters his University without having even heard the word "cost." There he enters the pure science department, where he is still told to add "excess" of his reagents regardless of cost. Probably he never goes to a technical college or to the applied science department (if any) of his University. He thus starts with a handicap that may take years to remove; all because educationalists have an obsession that training and experience in teaching is more important than a knowledge of the practice of the subject taught. Few people, whether trained or not, are born teachers. Few people can impart their knowledge clearly to the ignorant. Often those few do not get the opportunity to do so because they are held to be lacking in "experience"; it is the average science master or University lecturer who is, in the truest sense, "lacking in experience." Educational authorities throughout the country should accept industrial experience as an important qualification for teaching posts in science, and should judge the teaching abilities by the results of the first term's work.

Dr. Harris's paper suggests potent reasons why chemists are not more often found on the boards of industrial companies. Most people agree with Professor Gibbs that it is to the scientist that industry should look for inspiration and leadership. The fact that industry does not do so should cause us to examine carefully all reasons that are put forward for the eclipse of the scientist. There can be little doubt that one of the principal reasons lies in the mentality of the chemist himself. As a body he is definitely not a man of affairs: the engineer, the man from the office, even the works foreman, speak the language and think the thoughts of the business man better than he. That is partly due to a mistake in early training as we have pointed out. It is also due to mistakes in the handling of the scientific staff during their earlier years by the heads of the firm. Chemists are kept in the laboratory while the other members of the staff are sent out into the world. For most of us our education begins after we leave school, and during the first three or four years in industry our outlook is moulded and our activities are directed on to certain lines from which it becomes increasingly difficult to steer them as the years pass.

A Voice on the Board

IF the chemist is to take his rightful place and to assist the directors on the board of the company there must be a change in the methods of training during the earlier years; there must be a corresponding change in the policy of some business men now at the head of industrial concerns. Every care is taken that chemical processes shall be adequately controlled and efficiently operated to eliminate waste and to manufacture the best quality of product. Should not an equal care be taken with the human raw material and with those processes of human mental development going on within the works and under the eye of the management? It is a rule in scientific advertising that nothing should be done unless there is cold, solid reason behind its purpose. An equally rigid rule should apply in the management of staff. The capacity of the individual cannot be assessed so easily as the capacity of plant. There should be a definite policy of opportunity for development throughout the concern, not the haphazard method described and pilloried by Dr. Harris. In that way a staff of real value will be built up which will be a tower of strength to the concern. The modern development of business demands this scientific training of the staff.

We have assumed that directors really desire the ultimate assistance of their chemists on the board. We have an uneasy feeling that there are occasions when this desire is conspicuous by its absence. We have heard of one board that refused to consider the appointment of a chemist-director on the ground that "he will know so much more than we do that we shall never get our own way." Let any such, if still there be, note carefully Dr. Harris's conclusion: "One can remember so many instances where a chemist on the directorate might have saved thousands."

The Mother Chemical Society

ALTHOUGH the statistics of membership give cause for anxiety, the Chemical Society, which attains its centenary in another eight years and is therefore the oldest chemical organisation in the world, has reason to congratulate itself upon the success with which it has pursued the objects for which it was founded. At its ninety-second annual meeting last week Professor Henderson was able to report important progress

designed to extend the scope of the Society's activities and to ensure for it a greater measure of support from the chemists of the country. There is a great deal of truth in what the new president, Professor G. T. Morgan, said at the annual dinner. So freely have the benefits of the Society's operations been placed at the disposal of members of the chemical industry that they have come to be taken for granted, and there has been too little recognition of the expenditure of thought, time and money on the part of the pioneers and of those who in present years of depression have kept the flag flying. The present position of the chemist would have been very different if there had been no Chemical Society during the past century.

The steps outlined in Professor Henderson's presidential address for encouraging the influx of young chemists, for rendering the ordinary scientific meetings more attractive, for popularising the Society outside London by arranging more of its meetings in the provinces and for enabling local representatives to act as recruiting officers, should, however, be the means of restoring the membership to a more satisfactory level, but whether the Society will achieve the aim indicated by Professor Morgan of a centenary membership of 7,700 is somewhat doubtful. It may be that between now and 1941 some progress will have been made towards that measure of amalgamation which all our chemical leaders agree is desirable. Professor Henderson visualises a great chemical organisation with a number of sections devoted to professional affairs, pure chemistry and all or most of the branches of applied chemistry, including metallurgy, each with a considerable measure of independence but linked together through a General Chemical Council constituted on somewhat similar lines to the General Medical Council.

Technical Education

THE importance of encouraging technical education among the junior members of the staffs of all manufacturing industries is self-evident and acknowledged. The chemical industry is pre-eminently dependent for its efficient working upon the skill of its workers in all grades. It is of the utmost importance that in times of difficulty juniors should realise that only by education and improvement in their own value can they hope to avail themselves of opportunities which may come their way, and that if they do not make the necessary effort for self-improvement their future prospects will be gravely jeopardised. The chemical industry can, of course, see even farther than that. It is also important for that industry to have a constant supply of semi-trained and improving recruits to whom opportunity for advancement is given as and when they prove themselves able to take advantage of it.

This point of view should be brought prominently to the notice of the staffs and employees of every chemical works in the country. We trust that managers, chief chemists, and others in responsible positions will see that this is done. We also look to the local education authorities to play their part. It is disquieting to read that the London County Council has, in a period of depression and unemployment, raised its fees and as a result records that no fewer than 14,000 evening class students have been lost during the current year in polytechnics, technical institutes, schools of art, continuation schools and evening institutes. It is claimed that fees are already ridiculously low and bear no relation to the benefits gained. We hold that local authorities should encourage higher education even if the community has to contribute a little towards it, because education is necessary to the well-being of industry from which the country must derive its income. But we should like to see juniors impressed with that spirit of independence and self-help which would cause them to make some sacrifices in money and time to build the foundations of their own careers.

A Satisfactory Report

ELSEWHERE in this issue we review the report of Imperial Chemical Industries, Ltd., for the year ended December 31, 1932, to be presented at the sixth annual meeting of the company at the Central Hall, Westminster, next Tuesday. The report is one of the most encouraging that the chemical industry has received for a long time, and records a definite increase in turnover as compared with the previous year. Out of eight groups under which the company's activities are reported on, only two fail to report definite improvement (the explosive and the lime groups), and both of those report that on balance business has been maintained. Moreover, in the important Billingham enterprise there has been both an increase in fertiliser sales and, more significant, a wider spread of products, which makes the group more independent of the fertiliser market. There is also a fairly general reference in the various reports to reductions of costs, which are now being secured from reorganisation and past capital expenditure. It seems that the physical reorganisation is now complete; for the directors report that new capital outlay during the year was restricted to what was necessary to keep plants up-to-date and for the manufacture of certain new products mentioned in the report.

The financial re-organisation is reflected in the balance-sheet where, on the one hand, the company's direct holding of subsidiary concerns rises from £57,182,635 to £61,664,191, and where on the other hand, the ultimate net valuation of shares and advances in subsidiaries is written down from £69,264,978 to £66,308,139, by various transfers from reserve. Surplus current assets meanwhile rise from £16,739,000 to £17,450,000 (both including marketable investments at their book value), which includes cash and Government securities of £7,076,269, against £4,222,900. The gross income for 1932 amounts to £6,415,423, as compared with £4,668,685 for 1931, and after allocating £1,000,000 for obsolescence and £686,351 for the company's income tax, the net income for the year amounts to £4,729,072, as against £3,408,290 for 1931, or an increase of £1,320,782. The year's income relates solely to the year's operations, and includes no sum from profits on the sale of investments. After allocating £500,000 to general reserve, the balance for the year is £4,229,072 which with £516,825 brought forward from 1931 gives a total balance available of £4,745,897. The announcement that the ordinary dividend, which in 1931 fell to 4½ per cent., is to be restored to the 1930 level of 6 per cent. will be received with the utmost satisfaction.

The Chemical Society: Ninety-Second Annual Meeting

Professor Henderson on Prospects of Amalgamation

THE ninety-second annual general meeting of the Chemical Society was held at Burlington House, Piccadilly, on March 30, under the presidency of Professor G. G. Henderson. In his address on "The Present Position and the Future of the Chemical Society," the president spoke of the prospects and advantages of the amalgamation of the principal chemical organisations and expressed the view that a movement towards federation, if generally supported, would be welcomed by the chemical industry of the country. Professor G. T. Morgan, of the Chemical Research Laboratories, Teddington, and past-president of the Society of Chemical Industry, was elected president in succession to Professor Henderson, and presided at the anniversary dinner held in the evening at Grosvenor House, Park Lane. Other elections were:—Vice-presidents: Professors G. G. Henderson (past-president), W. P. Wynne (past-president), F. G. Donnan and C. S. Gibson; hon. secretaries: Professor S. Sugden and Dr. J. M. Gulland; members of council: Dr. J. Kenyon, Dr. G. A. R. Kon and Mr. J. Davidson Pratt (town members), Dr. R. G. W. Norrish, Dr. E. H. Rodd and Professor R. Whytlaw-Gray (country members).

Before the presidential address the following presentations were made: Longstaff Medal for 1933—Professor W. N. Haworth and Sir James Irvine. Harrison Memorial Prize for 1932—Dr. Emeleus. And to Professor J. C. Philip a volume commemorating his services as chairman of the Bureau of Chemical Abstracts.

Fewer Members

Professor HENDERSON, in his presidential address, said the unusually heavy list of resignations of Fellows and of those removed for non-payment of subscriptions was a striking feature of the council's report. Actually, considering the present economic situation, the Society had reason to be surprised that the losses and the consequent diminution of income were not heavier than they were. Some of the resignations had been withheld for more than a year in the hope that they could be avoided and these had increased the number actually recorded in 1932. Not a few had withdrawn their resignations, in many cases out of loyalty to the Society in these difficult times. A year ago, the treasurer was faced with a difficult financial situation and this he had tackled in a manner which had earned their admiration and gratitude. The financial affairs of the Society could not have been administered more efficiently and more sympathetically and they could not be in better hands.

The work of the Society in pursuing the objects for which it was founded had continued and actually increased during the past two years. The quality and number of original investigations, the results of which had been published, were both of the high standard associated with the Society's established reputation. The work of the Bureau of British Chemical Abstracts had increased in a manner corresponding with the ever increasing amount of original investigation by chemists generally. Bearing in mind the difficult conditions with which the Society had had to contend, they had reason not to be dissatisfied with its work for chemistry during 1932. Although the statistics of membership gave cause for anxiety, it was gratifying to report important progress designed to extend the scope of the Society's activities and to ensure a greater measure of support by the chemists of the country.

Professor G. G. HENDERSON
President of the Chemical Society, 1932-1933

In January of last year, said the president, the Council appointed a reorganisation committee to inquire into the general policy and the administrative system of the Society and to make recommendations accordingly. The work of this committee has in effect been an attempt to discover what changes are desirable to adapt the policy of the Society to present-day conditions.

Changes in the By-Laws

In some cases the decisions reached by the committee have necessitated changes in the by-laws, and these have been approved by an extraordinary general meeting. In the first place the council has taken a step to encourage the influx of young chemists by reducing, by one half, the annual subscription of Fellows under 25 years of age who are prepared to receive only such of the Society's publications as the council may determine. It has also been agreed that at the ordinary scientific meetings the custom of reading highly specialised papers shall be further restricted, and that a larger number of meetings shall be devoted to organised discussions and summaries of recent work.

The latter innovation has evidently appealed to the Fellows, for the four discussions held during the present session have attracted gratifying attendances. Moreover, in order to make the ordinary scientific meetings more attractive, the secretaries have been empowered to select papers to be read, and to arrange, if possible, for contributors to their discussion. In addition it is hoped that senior authors of a series of papers which have appeared in the Journal will publish at suitable intervals a résumé of their work. Furthermore, in consideration of the fact that the Chemical Society represents the whole country and not merely London and its vicinity, it has been agreed that a due proportion of the endowed and special lectures shall be given outside London, and that meetings of the Society, devoted to lectures or discussions of a general character and not to the reading of specialised papers, shall be held in other centres. In accordance with this resolution the Liversidge Lecture was given in Birmingham, and the Ostwald Memorial Lecture in Liverpool during the present session, and arrangements have been made for several extra meetings in other cities. It is, of course, intended that meetings of the Chemical Society outside London will be co-ordinated with the meetings of other chemical organisations in the districts concerned, and also that at these meetings all interested will be welcome.

Local Recruiting Officers

Local representatives of the Society have been appointed in a number of districts throughout the country, whose functions will be to keep in touch with Fellows resident in their respective districts, to act as recruiting officers, to arrange for special lectures or discussions in collaboration with the local secretaries of other chemical organisations, and generally to promote the interests of the Society. It is proposed that a meeting of these ambassadors of the council shall be held annually in London, in order to afford an opportunity for the exchange of views and for the formulation of proposals to be submitted to the council. It is hoped that the promotion of social intercourse among the Fellows, for instance,

by the arrangement of an informal dinner on the occasion of special lecture or discussion, will not be forgotten. In order to remove apprehensions which seem to exist in this connection, it should be made clear that the council has not contemplated the establishment of local sections of the Society. Numerous local sections of the Institute, of the Society of Chemical Industry, and of other societies are already in existence in a number of cities, and it would be a mistake to add to the number.

Since the beginning of this century, and particularly during the last twenty years, the chemical profession has experienced a considerable increase in members and a more widespread demand for its services to the community. New conditions have created new wants, and if the Chemical Society is to retain and increase its appeal to chemists it must adopt new methods with respect to administration, to representation of Fellows on the Council, to the production and distribution of its publications, and to its association with other chemical organisations. Steps in that direction have already been taken, but much more remains to be done. It is evident from articles and letters which have appeared in the chemical Press during the past year that the project of union or federation of at least all the principal organisations concerned with chemistry is making an appeal to an increasing number of members of the profession.

United Action Inevitable

The principal duty laid upon the Chemical Society is, first, to publish the results of original investigations communicated to the Society, of which the scientific value has been approved by the publication committee; and secondly, to prepare and publish abstracts of current researches which appear in the chemical journals of other nations. Any enforced diminution of this activity would be too deplorable for words, and yet must follow unless the Society can find new sources of income or new methods of retrenchment. So long as the Society remains, as now, an independent organisation, I cannot see how a larger income is to be obtained, and as you are aware, every method of reducing expenditure which can be adopted under existing conditions has been closely investigated. The same statement applies generally to the Society of Chemical Industry, the Biochemical Society, the Faraday Society, and other societies more directly interested in various branches of applied chemistry which publish journals or abstracts, or both.

Consequently one is forced to the conclusion that some form of federation of these societies is not only desirable, but sooner or later inevitable. Moreover in my opinion such a federation would be incomplete and lacking in influence unless the professional organisations were also included as members. In that case it should not be impossible to devise a scheme for an annual subscription, or scale of subscriptions, which would entitle the subscriber to membership of one or both of the professional bodies and at the same time of one or more of the publishing societies. The scale naturally could also be made dependent upon the number of different publications desired by each subscriber.

An essential feature of the scheme would be that the administrative work of all the members of the federation should be concentrated under one head in one office, for, as Professor Morgan has pointed out clearly, if the burden of administration expenses can be lightened by the pooling of resources there will be more money available for publication and less money demanded from individual chemists in the form of subscriptions.

A general council, composed of the officers of the constituent organisations and of representatives of the chemical industry, would be established to deal with the business of the federation.

The kind of federation which I envisage would not, to any material extent, involve the loss of their individuality on the part of members, for each has its special sphere of activity on behalf of the subject as a whole and of the profession generally. On the contrary, my feeling is that each member should, so far as possible, retain a large measure of autonomy and continue to carry on its work in its own way, of course, with the limitations which might arise from centralised administration and also with the expectations that still closer co-operation with respect to the publications of the different members might be attained. In some such way as this we could establish a great chemical organisation with a number of sections devoted to professional affairs, pure chemistry, and all or most of the branches of applied chemistry, including metallurgy, each with a considerable measure of independence but linked together through the General Chemical Council.

Support from the Industry

Whatever may be the nature of any scheme of union or federation propounded, the final decision must rest with the members of the organisations concerned. The council of any society would be exceeding its powers if it took action in this matter without being assured of the support of at least a large majority of its members. It savours of platitude to say that it is incumbent upon the officers and members of council of any society to endeavour to promote its welfare by all the means in their power; indeed most if not all of them would feel that they had betrayed the trust reposed in them by the members if they agreed to any scheme which would lead to a material reduction of the sphere of its activities or of its rights and privileges.

In conclusion Professor Henderson said he was confident that if chemists of all kinds got together in some such way as he had indicated the effect would be altogether beneficial to the profession. He believed that a movement towards federation would, if generally supported, be welcomed by the chemical industry of the country and that its sympathy might find expression in that financial support which they could not expect, and indeed did not deserve, to receive unless they set their house in order. The next two years must see great changes in the organisation of chemical societies in this country and they of the Chemical Society must be prepared to give sympathetic consideration to the scheme put forward by the Federal Council, which he hoped and believed would lead to the formation of a great federation. When that goal was reached, they might feel confident that their work for the benefit of chemists, and hence of the community, would increase and that their profession would at last take its rightful place as one of the leading professions.

The Anniversary Dinner

The anniversary dinner of the Chemical Society was held in the evening at Grosvenor House, Park Lane. Professor G. T. Morgan, the newly-elected president, was in the chair and the dinner was attended by close upon 250 Fellows and guests, amongst whom were Lord Rutherford, chairman of the advisory council of the Department of Scientific and Industrial Research, Lord and Lady Melchett, Lord Trent, Sir Ernest Benn, Sir Henry Dale, Sir Henry Fowler, president of the Institute of Metals, Sir Richard and Lady Gregory, Sir Philip Hartog, Sir Frederick Hopkins, president of the Royal Society, Sir James Irvine, Sir David and Lady Milne-Watson, Sir William Pope, president of the Federal Council for Chemistry, Sir Robert Robertson, Government Chemist, and Lady Robertson, Sir Frank Smith, secretary of the Department of Scientific and Industrial Research and Lady Smith, Sir Alexander Walker and Dr. R. H. Pickard, president of the Society of Chemical Industry.

Lord MELCHETT proposed the toast of the Chemical Society which, he said, was the oldest chemical organisation in the world. He was an unrepentant believer in the advance of science. Whether he viewed the situation as an industrialist, a banker, an economist or a politician, he believed that science, and particularly the science of chemistry, could do more for mankind than anything else. People to-day talked about the difficulties created by the inventions that were continually being introduced, and it was quite a common thing to hear people complain that too many inventions were made and that the distresses of mankind were due to the ingenuity and ability of the present-day chemist. It was well to consider the enormous benefits that had been conferred on mankind by chemistry, and to remember to what extent nature itself had been changed by the advances of the past century. One of the most remarkable developments had been the discovery of anæsthetics. Another development was the introduction of antiseptics and the spread of knowledge of how to destroy harmful germs and microbes. An exactly

opposite advance was the discovery of methods of fixing nitrogen from the air, and the unlimited and unbounded supply of fertilisers that had been given to us as a result. For years the world was threatened with the possibility of the starvation of the human race, but that bogey had been laid by the advance of chemistry. In every direction chemistry had altered our whole method of life. The development of the oil industry, the ability to produce petrol for internal combustion engines to run motor cars and aeroplanes, the ability to use rubber in a way that made efficient tyres were all due to chemical science.

One had only to look at the world to-day to realise that, instead of having invented too much, science had not yet invented enough. The terrible disaster of the "City of Liverpool" air liner and the great explosion that day at Mitcham showed that there was still ample opportunity for chemistry to step in to invent, in the first instance, some kind of non-inflammable dope for the aeroplane or through its sister science, metallurgy, to produce a light metal suitable for aeroplanes and not so liable to take fire. The same was true of the explosion at the Bush works at Mitcham, where one hoped that in due course science would invent new methods to overcome the dangers and accidents to which we were all liable to-day. There was nothing we ate, wore or touched that was not related in some way to chemical science and industry. Synthetic foods formed the subject of a jest frequently thrown at the chemist, but it was an entirely unfair jest. The truth of the matter was that the chemist had rendered a real service to humanity in that direction, in the preservation of food and in the work of the public analyst which protected the public in various parts of the country against eating poisonous foods.

Professor G. T. MORGAN
Newly Elected President of the Chemical Society

The Battle Won

A century and a half to two centuries ago chemists were very much mixed up with alchemists and with the mysteries of witchcraft and wizardry. People had a great prejudice against them and against all their works. For nearly a thousand years the chemist was regarded with the greatest suspicion. From the closing of the school of Plato until about the time of Francis Bacon there was no chemical progress, and its exponents did not have a particularly easy time. The very word "stinks" employed by the public schoolboy in referring to chemistry showed the prejudice with which the whole matter was regarded. So far as civilisation was concerned, the battle was now won, and people were realising the enormous benefits which chemistry had conferred upon mankind. Through chemistry we had won our way from an era of scarcity to an era of plenty, which seemed to be ruining us to-day. There was no shortage of anything in the world now. There was an enormous quantity of almost every commodity which man desired as a result of scientific endeavour and invention. The scientist was not to be blamed if the other elements that went to make up the economic life of any country or of the world at large had not yet found a proper method of distributing that great wealth to the people who so sadly needed it. That was equally true with regard to the question of leisure.

Mechanical power had largely taken the place of man power with the result that we had an enormous amount of leisure at our disposal which was now described as unemployment. They were told that this unemployment was going to last ten years, but he believed it was going to last a good deal longer. He believed that the scientists would put more people out of work than any government would succeed in putting into work, and he was not at all sure that that was such a disaster as they imagined. Surely if they regarded unemployment as the positive benefit of leisure instead of the positive disadvantage of enforced idleness they would begin to get a different conception of the problem. Mankind had been working for two things—plenty and leisure. Science had provided both; why then should we complain? All we had to do was to learn how to use them.

The Real Benefit of Leisure

If instead of having a third of the population out of work at a time and two thirds at work all the time they distributed their leisure more evenly and aggregated the periods at which a man was away from his work into larger units so that a man was "unemployed"—to use the old phrase—for two or three months at a time, they could do something for him and with him that could be very much to his benefit. They could educate him, develop him physically and ethically and raise him to a standard which they had not the opportunity to do at any time in history. Such a scheme would not require an enormous amount of money, but it would need understanding, concentration and common sense. Teaching people, developing them physically and intellectually, was not a thing that required a vast capital expenditure. He believed that we were moving into a period when unemployment, which had appeared to be our curse in the past, might prove to be one of the greatest blessings to mankind. He was not afraid of the inventions of the future because he had sufficient confidence in the idea that the same intelligence that produced the inventions which so troubled the economists and the politicians of the day would be powerful enough to produce the solutions to those problems.

We were, however, far from being able to obtain the full benefits of that which had been produced. We were still entirely without any systematic study of the future. While we had universities full of individuals whose business it was to investigate and to study the past, so far as he knew there was not a university in the world that had a professor whose business it was to study the future. There was no thought given to that question; there were no endowments for looking forward to the problems that were going to be imposed upon them. There had to be a change in that respect. We had got to realise that the world, with its highly complex civilisation, could not stand the imposition of further burdens and problems by revolutionary discoveries for which it was unprepared. Careful foresight and preparation could, he believed, foresee the trend of future discovery and work out some of the problems which were going to be thrown up.

Amalgamation Problems

Among the problems which seemed to face the science of chemistry, to-day at any rate, was the problem—not altogether new, but still comparatively novel—of amalgamation, the problem of joining forces with other chemical societies in order that each should benefit from the strength of the other. Schemes for the accomplishment of some such amalgamation had been put forward and were, indeed, making progress. It was not to be expected that such schemes would make progress without some trouble. Man was not the kind of animal to co-operate readily with other men. He was far more ingenious in finding obstacles than means of working together, but with all the profound respect which he had for

men of science, and particularly, by tradition, for men engaged in the science of chemistry he hoped there were men who would find a solution to the difficulties of co-operation.

There was a wider aspect of the future that affected not only scientific chemistry but the world at large. One often heard the question asked: "Is it possible for civilisation to survive not only the disastrous slump which is affecting the world to-day but the war which seems so likely to follow it?" That was a problem which had given us a great deal to talk about lately, and for his part he had come to the conclusion, perhaps wrongly, that civilisation would survive in any case, war or no war, because we seemed to have arrived at a stage, so far as one could judge, of scientific equilibrium. War to-day produced such enormous advances in scientific knowledge that the world promptly recovered from the devastating effects of war through the amount of extra knowledge acquired, owing to the invention and progress made because of war. The last war was perhaps the first in history from which mankind emerged richer than it went in, from the point of view of knowledge and scientific advance. That reflection had a significance of quite another character. Why was it possible to make an advance in war time? It seemed to him that it was possible because men were then prepared to spend money on scientific research which could never be obtained at any other time. Might we not change that, and secure expenditure on the advance of science in times of peace, and by the advance thus made avoid the disaster of war? Was it not possible to apply the advances of science to fight poverty and oppression which in the long run invariably drove the world to war? He believed it was possible but he believed it required a different outlook on life and a different outlook in politics.

The progress that could and should be made in the long run depended to an enormous extent on the individuals who made up such an organisation as the Chemical Society.

The New President

Professor G. T. MORGAN, responding to the toast, first thanked the Society for the honour it had conferred upon him in electing him as president. The Society, he said, was formed in 1841, with a membership of 77, and was now 92 years of age. In 1848, when it received its Charter of Incorporation, its membership was between 200 and 300. From 1841 to 1881 the Society doubled its membership with each succeeding decade. Since 1881 the increase had been somewhat less, but still considerable, and in 1911 it passed the 3,000 mark. Its peak year was 1926, when the membership was about 4,100. There had since been a falling off of about 400 members. There were probably many contributory causes for that diminution, but he suggested that one reason was that as the Society was the oldest established chemical institution its activities had come to be taken for granted. The chemist could now see the journal and the abstracts of the Chemical Society in any university library and in most of the well appointed public libraries up and down the country. Alternatively, if the chemist was a member of any of the large chemical firms he would find the Society's publications in the works library. There were many other respects in which the Society placed its services at the disposal of the chemist. As the mother society it had always been anxious to afford its advantages to those who were likely to benefit from them. From the many chemists who did not belong to the Society, the generosity of the mother society had not altogether met with the recognition that it deserved. The present position of the chemist would have been vastly different if there had not been a Chemical Society during the past 92 years. He was glad Lord Melchett had referred to amalgamation, and he would like to add that he hoped that as a result of that scheme they would receive increased help from the leaders of the chemical industry.

Work of other Societies

It was true that similar activities to those of the Chemical Society had been carried on by other bodies. He referred, for example, to the unemployment benefit fund organised by the British Association of Chemists, a body which had been in existence for twelve years and had a membership of some 1,500. Through that fund the Association had distributed more than £8,500 to those less fortunate members of their profession who had found themselves out of work. He referred also to the joint action of the Chemical Society and the Society of Chemical Industry in 1923 in forming the bureau of chemical abstracts, which had resulted in the elimination of a good deal of duplication, as well as a considerable economy in expenditure. In eight years the Chemical Society would be celebrating its centenary, and at that time the learned societies and other scientific associations from every civilised nation would be sending delegates and congratulatory addresses. When that time came what were we in the mother country going to offer the Society? Ninety-two years ago the membership was 77 and at the present time it was less than 4,000. In 100 years, the Society's membership should have increased a hundred-fold. Was it possible to increase the membership to 7,700 by 1941? He believed it could be done if they could come to some reasonable understanding with the substantial majority of their fellow chemists. During the intervening years it should be their aim and endeavour to dissolve away vested prejudices with the universal solvent of goodwill, and to remove conflicting interests wherever they arose with the catalyst of comradeship, so that when the great day arrived they would be able to offer the mother society the fitting tribute of a unified profession of British chemists.

Sir WILLIAM POPE proposed the toast of the guests, which was responded to by Professor Peter Debye, Faraday Lecturer, 1933, Sir Frederick G. Hopkins, president of the Royal Society, and Sir David Milne-Watson, governor of The Gas Light and Coke Co.

Chlorinated Rubber Paints

Relation of Film Strength to Chlorine Content

THE Institut für Lackforschung, Berlin, recently organised a technical conference in which a number of practical points arose in connection with chlor-rubber paints and varnishes, as reported in "Kautschuk," 1932, *8*, 189. According to the "Rubber Age" Mick commented on the rapid improvement that had been effected in producing chlorinated rubber, previously a very variable material, but now reliably uniform. He noted that with a chlorine content below 40 per cent. the product is unstable. A rapid test for stability consists in painting the material on copper sheet, covering half with black paper for comparison, and exposing the uncovered half to ultra-violet light; unstable films rapidly form copper chloride in this test. Mick also reported weathering tests on chlorinated rubber varnishes in which the results were quite favourable, by comparison with the usual varnishes, after exposures of 18 months. Contrary to views expressed by others (Sachs, "Kautschuk," 1932, *8*, 175) he could not obtain satisfactory results with mixtures of chlorinated rubber and linseed oil, though alternate layers of the two kinds of varnish were excellent. It was noted that the higher the chlorine content of the rubber, the weaker and more brittle is the film formed.

German Mercury Market

A Return to Italy and Spain as Source of Supply

WITH the dissolution of the Italo-Spanish mercury cartel last year, producers in those countries apparently have regained command of the important German mercury market, according to German import figures for 1932. In 1928, when the cartel was formed, Italian and Spanish mercury formed 82.5 per cent. of the German imports, from which the proportion rapidly dropped to 55 per cent. in 1931, with total imports declining at the same time from 1,328,100 kilos in 1928 to 337,900 kilos in 1931. Mexico and the United States gained most from this movement; together they filled 3.1 per cent. of the German demand in 1928, 19.6 per cent. in 1930, and 18.1 in 1931. In 1932 the effort to maintain high prices by cartel methods was abandoned, and the trade movement changed. German imports of mercury rose to 357,200 kilos during the year, of which 71.5 per cent. came from Italy and Spain. North America contributed only 7.5 per cent., all from Mexico, and none late in the year. The fact that Italian and Spanish recovery of the German market was due to reduction of prices is indicated by the sharp drop in average valuation of the German imports—only 5.36 Rm. per kilo in 1932, compared with 10.92 Rm. in 1931 and 13.34 RM. in 1928.

The Centrifugal in the Chemical Works

Modern Improvements Increase Range of Utility

CENTRIFUGAL driers or separators are necessary equipment in almost every chemical works, and most chemical engineers are familiar with the uses of these machines for treating anthracene, naphthalene, ammonium sulphate and crystalline and granular products of all kinds. Centrifugals for this purpose have perforated baskets, usually lined with screens or filter cloths, to prevent solid matter being carried away with the liquor.

When it is desired to treat slimes or colloidal matter, the most satisfactory method is by using a centrifugal machine of the under-driven type, fitted with an imperforate basket, such as made by Thomas Broadbent and Sons, Ltd. (Fig. 1). The action of this type of machine may be likened to that of a gravity filler or settling tank, whereby the solids are separated by the force of gravity; centrifugal force is substituted for gravity, and the rate of separation is greatly intensified. With this class of machine the liquor or slurry is fed into the basket until the liquor line is almost vertical with the lip of the basket. The flow is then stopped, and time is allowed for centrifugal force to deposit the solid particles against the wall of the drum. When separation has been completed, a specially curved pipe and nozzle is brought into contact with the inner surface of the liquor, and the free liquor is skimmed off in a continuous stream. The velocity of the fluid is sufficient to force it through the pipe line to a receiving tank, placed on the ground level or above the machine. The machine is then re-charged with a further supply of mixture, and again skimmed. If the percentage of solids in the mixture is small, this cycle can be repeated several times before it is necessary to stop the machine, to allow the solids to be taken out. The precipitate is always of uniform specific gravity—a very important point in the manufacture of certain products—and the thicker the cake the better the filtration, as the cake itself acts as a filtering medium.

This machine, it may be added, has an almost unlimited field of application, and is now competing very successfully with filter presses and settling tanks. It occupies very little floor space, and is clean and easy to work. It is very often used for "roughing-out" solids from a liquor, in order to

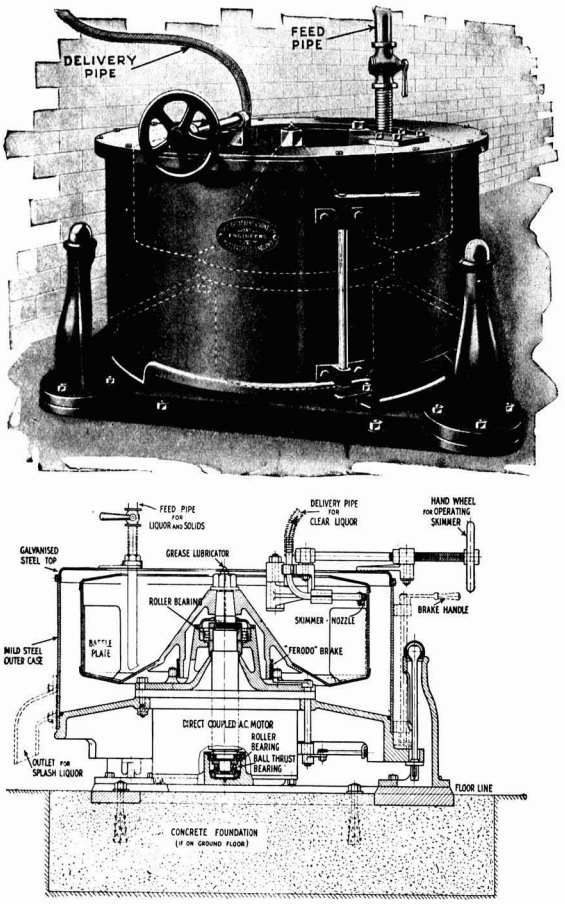
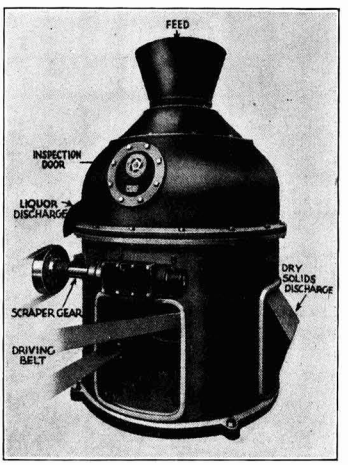


Fig. 1.—Broadbent Centrifugal of the Under-driven type, fitted with Imperforate basket.



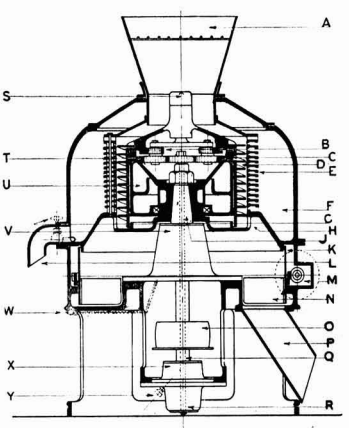


Fig. 2.—Broadbent continuous Self-Discharging Centrifugal Drier for Dewatering Material passing 1 in. mesh.

facilitate subsequent clarification in a smaller high-speed super-centrifugal.

For many years, imperforate-basket centrifugals have been used for de-watering sludges from various waste effuents; for recovering the grease from wool scouring plants; for recovering fibres from slurry; for de-watering paper pulp, wood pulp, brewers' yeast, pigments, white lead, chalk, starch, vinegar, medicated wines, fruit pulp, tannery effluent, de-watering tar, etc. The fact that the initial cost is small, and the maintenance almost negligible, makes a big appeal to chemical engineers, and they are now appreciating the usefulness of the imperforate basket centrifugal.

Broadbent's have recently placed on the market two new types of centrifugals, which are certain to arouse considerable interest amongst chemical engineers. The first of these (Fig. 2) is a continuous self-discharging drier for de-watering material passing through about 1 inch mesh. The second is a continuous self-discharging slurry separator for reclaiming solids from a slurry consisting of solid matter in suspension in the liquor. Both of these machines have been subjected to prolonged and very severe tests under actual working conditions, and have given the greatest satisfaction. In the case of washed coal containing 28 per cent. moisture, this can be treated at the rate of 30 tons per hour, and the moisture content reduced to 6 to 7 per cent. Coal slurry containing 10 per cent. solids, can be treated at the rate of 2,000 gallons per hour, and the effluent water will not contain more than 1 per cent. solid matter. There are great possibilities for both of these continuous machines in the chemical industry, and they are adaptable for treating a large variety of chemical products at a very rapid rate.

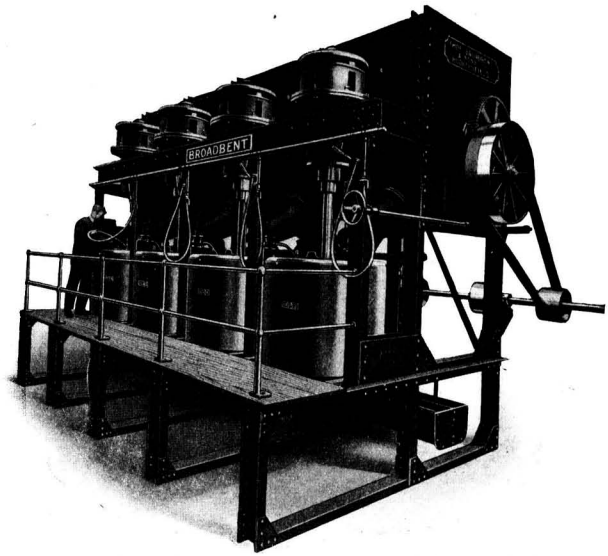


Fig. 4.—A Battery of Four 42 in. Direct Electrically-driven Broadbent Centrifugals.

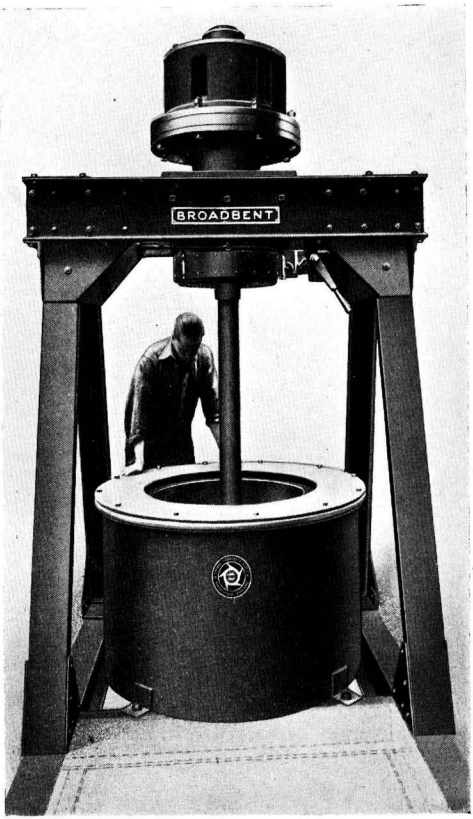


Fig. 3.—42 in. Direct Electrically-driven Broadbent Centrifugal with Central Bottom Discharge.

A High Degree of Efficiency

Probably the most popular type of centrifugal for de-watering crystals of all kinds is the direct electrically-driven machine (Fig. 3). Modern improvements have brought this type of centrifugal to a high degree of efficiency. A machine of this type, when fitted with a motor specially constructed for the special duty, and a well-designed top bearing, should give many years of continuous reliability without any attention whatever, beyond lubrication and an occasional adjustment of the brake, to compensate the wear on the lining. This type of centrifugal can be supplied with a high starting torque motor, with characteristics which permit it to be direct coupled to the basket spindle without clutch, thereby increasing the rate of acceleration, and entirely eliminating all troubles due to wear and tear of the clutch. This class of machine can be supplied as a single unit or in batteries of any number (Fig. 4), depending upon the quantity of material to be treated per day. If desired, a collecting tank can be placed above the centrifugals to hold the mother liquor, thus enabling the liquor to be fed direct into the basket of the centrifugal by means of sluice valves. The tank can be fitted with stirring paddles to keep the liquor in constant agitation. The dried product can be discharged into a conveyor beneath the baskets, and which runs the full length of the battery. In cases where it is desired to convey the dried product to a floor above, an elevator can be arranged to work in conjunction with the conveyor. With an arrangement of this kind it is possible for one man to superintend the working of a complete battery of centrifugals.

There is now on the market a great variety of anti-corrosive metals and alloys from which centrifugals can be fabricated. Chemical engineers have usally more experience and knowledge of the most suitable metals which will best withstand the corrosive action of their particular product. Metals which are admirably suited for one product are almost useless for another. It is always advisable for the chemical engineer to specify the metals from which the basket and linings (if any) for the monitor case have to be constructed.

Should this not be known, then the name and nature of the product to be centrifuged must be communicated to the makers of the centrifugal, who will, no doubt, be in a position to give advice or carry out corrosion tests on various metals to determine the most suitable. The abnormal wear and tear imposed upon a high-speed centrifugal demands specialised knowledge in the manufacture; consequently, if maximum efficiency and service are to be obtained, it is always advisable to install the best make of machine that can be obtained. British-built centrifugals are admitted to be considerably more substantial and capable of being run at higher speeds than American or Continental machines, and users can be assured of obtaining the best if they make a choice from any of the well-known firms in the country.

Centrifugals with self-discharging baskets (Fig. 5) are used for certain products. There is *no discharge valve* with this type of basket, and the material, is, consequently, very easily and rapidly discharged immediately the centrifugal is stopped. It is rather surprising that more use is not made of this type of basket.

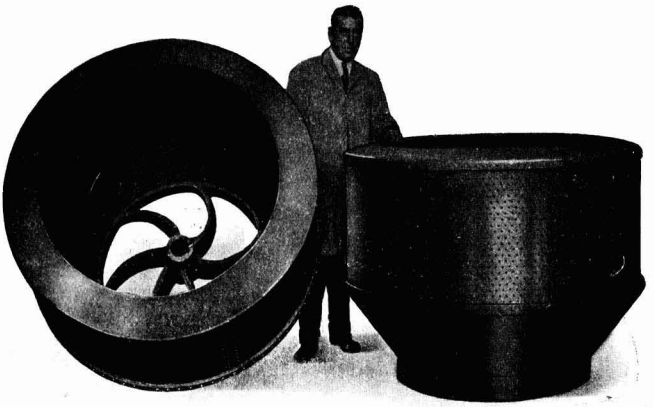


Fig. 5.—Two 54 in. × 32 in. Broadbent Self-Discharging Baskets, which permit Gravity Discharge immediately the Centrifugal is stopped.

British Association of Chemists

Activities of the Liverpool Section

THE annual general meeting of the Liverpool Section of the British Association of Chemists was held at Widnes, on March 29, Mr. H. P. Minton, chairman of the Section, presiding. Mr. Minton referred to the work of the officers of committee and said that the Liverpool Section had been in existence since 1917. Although they had had their ups and downs, the section was now on the upgrade, as witness the increase in membership and satisfactory financial balance. He referred appreciatively to the work of the president, Professor E. C. C. Baly, the hon. secretary, Mr. A. Betton, and the hon. treasurer, Dr. F. W. Kay.

Presenting the report for the 1932/33 session, the secretary said there were 16 new members, five members had resigned, one member died during the year, four were transferred to the Liverpool Section and two were transferred from Liverpool. At the end of the session there were 157 members and 19 probationary members, a total of 176, as against 144 and 21 respectively in the previous year—representing a gain of 11 members over the previous year. Due to the world-wide depression in trade, their greatest achievement, the unemployment benefit scheme, had been much in the limelight and had given the London Committee and through it the Council, considerable work, not only on account of benefits to be paid, but in the peculiar and precedent-creating cases which had to be considered. When one thought of the sum paid in benefit last year, £1,540, the work of controlling this activity would be appreciated and the soundness of the scheme which had now built up a reserve fund of over £8,000 was a tribute to those who inaugurated and maintained this splendid service in the interests of the profession. Legal obligations prevented payment of unemployment benefit in cases of sickness and the Council had asked all members to assist by contributing to the special aid fund.

The Registration Committee—a Manchester and Liverpool activity—explored further possible means of creating a directory of chemists. The results at present were negatived by reason of the fact that only by shouldering the whole expense of such a publication could the Association take this first step towards the creation of a register of chemists. The Association as a whole gained 169 new members up to October last year. The Liverpool Section's education committee had given the council excellent help by crystallising a definite scheme for interesting undergraduates in association membership. Those beginning a career in industrial chemistry had most to gain from membership of the Association and would later on be those on whom the future of the Association would largely rest. Much of the work of the council was confidential and because of this, publicity could not always be given to the spadework without which the fruits of the Association as a whole would not be so palatable.

Officers for the ensuing year were elected as follows: Chairman, Mr. H. P. Minton; vice-chairman, Mr. M. Rosebery and Mr. W. S. Reid; hon. secretary, Mr. A. Betton; hon. treasurer, Dr. F. W. Kay; committee, Professor E. C. C. Baly, ex officio, Messrs. C. A. M. Foster, T. E. Fore, G. S. Irving, C. C. Riley, T. L. Looker, W. Mansbridge, E. Myer, L. Wild, C. A. Wylie, J. W. Crabtree, W. Ninniss and Dr. H. G. Bott.

Mr. C. A. M. Foster mentioned that the Institute of Chemistry's analysis of vacancies for qualified chemists for the year to September, 1932, gave a total of 569 as against 490 for the previous year, of which 312 were for industrial chemists.

The chairman said that 1,400 appointments were notified to the Association's unemployment bureau during the year. Employers of chemists were increasingly using this bureau when desiring to engage qualified chemists.

THE new refinery of the Shell Oil Company, Vancouver, commenced operating in December on a 24 hour a day schedule, five days a week. Construction work on the first unit of the £200,000 plant is proceeding most satisfactorily. Between 2,500 and 3,000 barrels of crude oil can be refined each day. When completed, the plant will handle 10,000 barrels daily.

Sodium Aluminate in Water Treatment

Principle and Advantages of the "Alfloc" System

THE treatment of water for various purposes falls into two main categories—(a) the removal of magnesium and calcium (water softening), (b) the removal of coloured and suspended impurities (filtration). Chemical precipitation processes have been devised for both types of treatment. The success of these processes, however, depends firstly on the completeness and speed of the chemical reactions, and secondly on the facility with which the precipitated particles can be removed from the purified water.

Water softening by use of lime and soda ash alone has many deficiencies, due chiefly to (1) space required for proper sedimentation of the precipitate; (2) residual hardness of 3 to 4 degrees; (3) finely divided nature of products produced during the reaction; (4) incomplete removal of magnesium; (5) failure to remove silica; (6) excessive chemical overtreatment necessary to produce lower degree of hardness; and (7) "after-precipitation." Previous efforts at coagulation of the finely divided substances of the reaction had been made using aluminium sulphate and iron sulphate together with an excess of slaked lime to form flocculent precipitates of aluminium and ferrous hydroxides, but the wide-spread use of these coagulants was prevented for two reasons, (a) the corrosive nature of acid coagulants, and (b) the additional soda ash required to treat the calcium sulphate formed.

It was discovered that sodium aluminate, reacting with calcium, and silica, or magnesium, produces a unique flocculent precipitate with much more powerful coagulating properties. Alfloc sodium aluminate, introduced for water treatment by Aluminium (II), Ltd., of London, is an alkaline salt, and, in addition to its beneficial softening effect, is non-corrosive. When sodium aluminate is added to the softening chemicals, it has also been observed that a material reduction in the lime charge is obtained, due, no doubt, to the removal of the colloidal interference of organic matter and of the double salts of magnesium which so frequently retard the action of lime and prevent complete softening. The speed of chemical precipitation and also completeness of softening reaction both in hot and cold process plants, show a marked increase when sodium aluminate is used. There is, for instance, a more rapid reduction in the hardness of treated water and a lower degree of hardness is obtained than by the use of lime and soda ash alone. In addition, there are the added advantages of a reduction of sedimentation space and the elimination of after-precipitation. In general, combined Lime, Soda Ash and Sodium Aluminate softening saves 25 per cent. in time and space and reduces the hardness and alkalinity of the water treated by 50 per cent.

Overcoming the Formation of Silicate Scale

Waters containing magnesium cannot be treated successfully in the ordinary lime and soda ash softener. The elimination of the magnesium salts from water used for boiler feed purposes is important, as, if present as the chloride or nitrate, they will hydrolyse to give free acid in the boiler thereby leading to severe corrosion. The removal of basic magnesium carbonates is equally important, since these frequently give rise to after-precipitation in pipe lines, filters and economisers. Magnesium aluminate is known to exist in several forms. Alfloc sodium aluminate is especially manufactured to react rapidly with magnesium salts to form a flocculent magnesium aluminate, which is considerably less soluble than other magnesium salts. In many treated waters the amount of magnesium left in solution is undetectable even by the most sensitive tests, the residual hardness consisting almost entirely of calcium carbonate.

Whilst it is impossible to prevent the formation of silicate scale by ordinary methods, the correct use of Alfloc sodium aluminate satisfactorily overcomes this difficulty. Silica is found both in the colloidal and soluble form in raw water and natural waters in Great Britain contain from ½ to 1½ grains per gallon. For high pressure boiler work, the presence of silica in feed water is especially dangerous and the necessary steps for its removal must be taken. Sodium aluminate and silica react to form an insoluble calcium or magnesium zeolite and under properly controlled conditions, this reaction will ensure the complete precipitation of silica in the boiler water. Improved clarification is also a striking feature of Alfloc sodium aluminate softening. The floc which is produced consists of magnesium aluminate and complex aluminosilicates, and being gelatinous and relatively large in size is a powerful absorbent and adsorbent. During its formation the floc passes through a colloidal condition resulting finally in the formation of a gel. The amphoteric nature of aluminium colloids results in the precipitation of other colloids such as colouring matter, colloidal silica, etc., attracting them from solution. The gelatinous aluminate floc readily surrounds and agglomerates these precipitated particles together with the more rapidly formed portions of the calcium and magnesium precipitates. After formation, the floc adsorbs the other finely divided particles of calcium and magnesium produced gradually in the sedimentation tank and thus becomes heavily loaded. Due to this removal of fine particles, the water becomes much clearer.

The use of the Alfloc system in lime and soda ash softening will therefore give, without excessive overtreatment, (1) a stable treated water of low residual hardness, (2) no residual magnesium hardness, (3) a minimum content of silica, and (4) crystal clarity and rapid settlement of suspended matter.

Improved Working Conditions

The use of a properly treated water for boiler feed water purposes will give greatly improved working conditions. The adoption of sodium aluminate as a coagulant and accelerator in lime and soda ash softening will eliminate "after-precipitation," and thus the possibility of choked pipe lines, heaters, economisers and feed pumps is eliminated. The boilers will be free from scale with a consequent longer life of tubes, etc. The industrial uses of lime and soda softened water, however, are very varied. Every particular application has its own individual problems, and each case must be considered from the standpoint of the design of plant and purpose for which water is required.

Another application of the Alfloc system is the coagulation of matter precipitated internally in steam boilers, a process developed with great success. It is, of course, preferable to "soften" water outside a boiler, but in practice many plants are operated without an external softening plant. This necessitates some method of internal softening, if scale formation and corrosion are to be prevented. Internal treatment employs the boiler as a "hot process softener." In this manner the whole of the calcium and magnesium salts are precipitated and removed as sludge. In both the external and internal systems the amount of soluble salts are the same—the essential difference is the much greater proportion of sludge produced in the latter system, but under this new system the sludge can be safely removed by a simple method. The casual addition of chemicals, whether of known or unknown composition, to the boiler plant is much to be deprecated, as reagents added in this manner tend to cause incrustation in feed lines, pumps, etc. Research and improved manufacturing processes of a special character, have enabled the production of a complete range of stabilised solutions containing the correct quantity of sodium aluminate for each particular purpose. From these solutions a "floc" is automatically liberated actually within the boiler itself sufficient in amount to coagulate the precipitated solids, *i.e.*, the hardness, whilst stabilising reagents in the solutions (a characteristic quality only present in Alfloc grades) delays reaction until boiler conditions are encountered.

Special Type of "Floc" Formation

An inspection of the water from a boiler treated internally by the Alfloc system shows a special type of floc formation. The striking feature of this system is the mobility of the suspended matter, and the clarity of the water between the particles. This type of floc will not adhere to metal surfaces, hence scale is impossible, provided that special attention is paid to the ratio of ions present in the boiler water in accordance with modern boiler water practice. Sodium carbonate, or sodium phosphate may be used to furnish additional alka-

linity, the choice depending on boiler operating pressure. Another special feature of the Alfloc system is its application in the prevention of the formation of silicate scale. This is based on a careful study of the chemistry of zeolites under many conditions. Still further application can be found in the conditioning of water previously softened by zeolite softeners. Most water contains silica and may also pick up additional silica from the zeolite bed. As the prescence of silicate scale frequently results in the loss of boiler tubes, its removal is important, and it is in combination with silica that Alfloc sodium aluminate will form calcium and magnesium alumino silicates which are non-adherent.

In any system of treatment for the conditioning of boiler feed water, the importance of correct control cannot be overemphasised. Frequent samples should be taken from the boiler and subjected to simple tests to ensure that the requisite conditions are maintained. When satisfactory coagulation of suspended matter is obtained, scale forming and priming tendencies are definitely reduced but proper control of the hydroxide and carbonate alkalinity must be established to prevent scale and corrosion. Attention must also be paid to the CO_3/SO_4 ratio to prevent the formation of sulphate scale.

Generating Station Practice

In modern generating stations it is common practice to make up the losses in feed water with distilled water from evaporators, these being fed either with raw or softened water. The presence of scale in the evaporators is a source of considerable trouble and expense. The elimination of foaming and priming is essential, otherwise the main feed water may be contaminated with the possibility of serious results. The use of sodium aluminate in the softening plant will ensure that a water containing less solids is fed to the evaporator with the result that priming tendencies will be reduced and scale will not be formed. Sodium aluminate may be fed directly into the evaporator by means of a small pump and improved coagulation of the precipitated sludge secured by the addition of magnesium sulphate. If raw water is fed to the evaporators, this may be treated scientifically in the evaporators themselves by the Alfloc system of internal softening to which previous reference has been made. At one modern generating station, the effective evaporation was increased by 250 per cent. by the entire removal of scale. In this particular instance, the scale contained 10 per cent. SiO_2 and was 1/16 in. thick. The removal of this scale by mechanical means was a long and arduous procedure, but the use of the Alfloc system, by its success in eliminating this scale, is now an established practice. In a number of cases considerable economies have been effected by conditioning the main feed to the boilers, the period between boiler washings having been doubled.

Filtration

As regards the removal of organic impurities from water, this was formerly commonly effected by the use of aluminium sulphate, which, reacting with the carbon dioxide and bicarbonates present in the water, produced flocculent aluminium hydroxide. Unfortunately the reaction is not complete and aluminium salts tend either to pass the filter material (*e.g.*, sand) in soluble form, or by gradual hydrolysis, fill up the pores of the filter bed. The Alfloc system of double coagulation using sodium aluminate and aluminium sulphate before filtration consists of producing an active nucleus whereby smaller quantities of aluminium sulphate can be used to give complete flocculation. The resulting floc is more adsorptive and is large and coarse enough to be retained easily on the surface of the filter medium, from which it is easily detached by back washing. There is much less chance of precipitate being freed through the filters if pressure surges occur. The matt of active floc so produced offers less resistance to the flow of water thus permitting longer filter runs. This system is in operation at a number of the largest modern municipal plants.

A Few Words of Warning

The Alfloc system has achieved its present measure of success by careful attention to the high quality and composition of the various grades of Alfloc sodium aluminate which are supplied, and secondly, by the help which is willingly afforded to users of the system to ensure that they obtain in practice the economies and improvements which are possible. It is very desirable that those interested in sodium aluminate should not allow themselves to be confused by the varying chemical descriptions of different grades. The actual content of soluble alumina is of paramount importance and all calculations should primarily be based on this figure. Sodium aluminate is essentially a compound of alumina (Al_2O_3) and soda (Na_2O) but care must be taken to avoid the error of adding the alumina content to the content of soda and expressing the sum as sodium aluminate of a certain percentage strength of a particular molecular ratio. Thus, presuming a compound "A" be made with one molecule of Na_2O to one molecule of Al_2O_3, this could be truthfully described as sodium aluminate of 100 per cent. strength (molecular ratio $Na_2O : Al_2O_3$ of 1 : 1) and would contain 62.2 per cent. Al_2O_3. Pursuing this in a logical way, another product "B" might be made containing two molecules of Na_2O to one molecule of Al_2O_3. Although this would only contain 41.8 per cent. of soluble alumina (and consequently be only two-thirds of the strength of compound "A," yet in order to mask this inferior strength it might be described as sodium aluminate 100 per cent. molecular ratio $Na_2O : Al_2O_3$ of 2 : 1. The extra molecule of Na_2O would be present actually as NaOH, and obviously could be more cheaply purchased as caustic soda itself. Hence it cannot be too strongly emphasised that the fact of paramount importance in the analysis of any grade of solid sodium aluminate is the actual soluble Al_2O_3 content.

There are two other important points which must be emphasised. Firstly, it is manifestly uneconomical to pay carriage on water content in the dry material, hence solid sodium aluminate should be anhydrous; some products have been known to contain as much as 20 per cent. water, and apart from the question of the cost of carriage, this additional water has to be stored and handled. Secondly, the molecular ratio of Na_2O to Al_2O_3 should be only just sufficient to render the product freely soluble in water. Alfloc C.P. sodium aluminate is the highest quality product available. It is completely soluble, contains no impurities, and no water. It is manufactured in Great Britain under rigid control by one of the largest producers of aluminium and its quality is unvarying. It is sold strictly on analysis basis, copies of which are always available. The notable successes of the Alfloc system in lowering operating and maintenance cost are largely due also to the careful technical control exercised in its application. Before the use of the system is recommended, full particulars of the present operation are obtained and a report is submitted stating exactly the various advantages which are claimed to be possible in each particular case.

Molasses as a Fertiliser

Reports of Recent Investigations

ACCORDING to the "Fertiliser and Feeding Stuffs Journal," reports are now available of two interesting experiments involving the use of molasses for fertilising purposes. The first, by Mr. E. J. R. Barke, appears in the "Annual Report of the Bureau of Sugar Experimental Stations," Queensland, and refers to a 10 ton application of cane molasses per acre as having been responsible for an increase of sugar-cane yield of almost 13 tons per acre over plots receiving no treatment. Further, the molasses gave a yield of almost four tons more than was obtained from plots which received fertiliser equivalent to the plant food content of the molasses. The extensive use of molasses on cane fields is becoming increasingly prevalent in the northern areas of Queensland. A reference to the statistics for 1931 shows that 1,753,086 gallons were so used, and that the quantity run to waste has been reduced to the lowest proportions on record.

Writing in "Zeit. Pflanzener. Düng. Bodenkunde," Mr. K. Maiwald describes experiments with beet molasses as a fertiliser that were made both in pots and in the field. When applied at the rate of 1.5 metric tons per hectare (about 1,338 lb. per acre), practically all the potash and about half the nitrogen of the molasses were utilised. When used in larger amounts, the results were not proportionate, and in some cases the yields were depressed. Composting the molasses with earth increased its fertiliser value.

Industrial and Engineering Chemistry in the United States

Spring Meeting of the American Chemical Society

AT the spring meeting of the American Chemical Society held at Washington, March 26-31, a new method of producing hydrogen sulphide and thiosulphates was described by G. Lynn, E. M. Allen, B. K. Beecher, and R. W. Darbyshire. The authors pointed out that hydrogen sulphide has long been known to be essential in controlling corrosion in the ammonia-soda process, but a review of the literature reveals no really satisfactory production method. The new process was one in which sulphur is boiled with an aqueous alkali solution under pressure, the steam being selectively condensed and returned to the boiler and the gaseous H_2S allowed to pass on. NaOH or Na_2S is satisfactory if pure H_2S is to be produced, or Na_2CO_3 if a CO_2-H_2S mixture is satisfactory. The pressure may be high enough to produce liquid H_2S direct, and either $Na_2S_2O_3$ or Na_2SO_4 may be produced as a co-product.

The effect of catalysts on the reaction between hydrogen sulphide and propylene was dealt with by H. R. Duffey, R. D. Snow and D. B. Keyes, who determined the effect of catalyst, temperature (200° to 300° C.) and time of contact on the synthesis of mercaptans. Several of the catalysts promoted polymerisation or decomposition of the propylene at the space velocities studied. Among the best catalysts were phosphoric acid on activated charcoal, fuller's earth, bentonite, and activated charcoal. Maximum conversions ranged from 16 per cent. at 200° C. to 2 per cent. at 300° C. at space velocities (c.c. gas per c.c. catalyst per hour) of 1.4 and 6 respectively.

Recovery of Sulphur Dioxide by Catalytic Oxidation

Recovery of sulphur dioxide as dilute sulphuric acid by catalytic oxidation in water solution was the subject of a paper by R. L. Copson and J. W. Payne. In agreement with the results of Johnstone, it was found possible to recover sulphur dioxide from waste gases as dilute sulphuric acid. Mixtures of sulphur dioxide and air were bubbled through water containing manganese sulphate as catalyst. Thirty per cent. acid was readily produced, but the reaction ceased at about forty per cent. acid. In a glass column with a "fine" porous plate at the bottom through which the gas was introduced, rates of absorption several times greater than those reported by Johnstone were obtained. The concentration of catalyst, temperature, gas composition, rate of gas flow, and depth of absorbing solution were studied as affecting the rate of absorption. Other experiments showed that the rate of absorption per unit volume was greater with a " fine " porous plate than with a " coarse " plate. The rates of absorption per unit volume in both a small and a large packed tower were found to be very much smaller than those in the glass column with porous plate bottom. The catalyst was found to be susceptible to " poisoning " by minute amounts of certain substances. In this connection, water from several sources, refinery gases containing sulphur dioxide, and various materials of construction were tested.

The presence of substances which destroy the catalytic properties of manganese ions accounts for the low efficiency of sulphur dioxide removal by bubble washers operating on the catalytic oxidation principle, according to H. F. Johnstone in his paper on the effect and removal of inhibitors in the catalytic oxidation of dissolved sulphur dioxide. Among the substances found to possess inhibitor properties are phenols, alcohols and a few metallic ions.

Synthesis of Acetylene from Methane

Experiments on the synthesis of acetylene by the pyrolysis of methane were reported by H. H. Storch and P. L. Golden. It has been found possible to obtain a product containing about 10 per cent. of unsaturated hydrocarbons (mainly acetylene), 10 per cent. carbon monoxide, 35 per cent. hydrogen, and 45 per cent. methane, by passing a mixture of 75 per cent. CO_2, 25 per cent. methane through a tube at 1,500° C., the time of contact being 0.03 to 0.04 sec., and subsequently scrubbing out the CO_2. With somewhat longer times of contact the water gas content of the product increases at the expense of the methane, the percentage of unsaturateds remaining approximately constant. Steam appears to be less desirable than carbon dioxide as a diluent because the loss of methane as carbon deposited in the reaction tube, which is only a few per cent. when CO_2 is used, mounts to 15 to 20 per cent. when steam is used.

Removal of Thiophene from Benzene

According to H. N. Holmes and N. Beeman, although the use of anhydrous aluminium chloride for the removal of thiophene from benzene was suggested as early as 1895 industry has failed to adopt this method, preferring the wasteful sulphuric acid treatment. Investigators assumed that such inadequate removal of thiophene as the secured with aluminium chloride was due wholly to chemical reaction; consequently they carried out the treatment at higher temperatures, usually at the boiling point of benzene. Holmes and Beeman, however, have carried out the treatment at temperatures preferably ranging from 25° to 35° C. and use their aluminium chloride in a special fractional manner with effective agitation.

The relative values of the initial absorption rates of carbon dioxide by water and by dilute sodium carbonate solutions was the subject of a paper by H. S. Davis. In a former study on batch absorption of gases, Davis and Crandall reported that the initial rate of absorption of carbon dioxide by dilute sodium carbonate solution was faster than the initial rate by pure water. Inasmuch as this result has been questioned by other investigators (Payne and Dodge), the experiments have been repeated and the result confirmed. It was pointed out that the theory of liquid stationary films has been developed largely from measurements on batch absorption in liquids. The laws which have been developed should be applied only with caution to gas absorptions in continuous counter-current tower systems.

Letters to the Editor

The Importance of Rubber Research

SIR,—May we, as independent consulting chemists, each of whom has been engaged in research problems connected with the rubber industry for more than twenty-five years, and neither of whom has, moreover, any material interests in the Research Association of British Rubber Manufacturers, support the efforts which are being made to enable this co-operative research organisation to continue its invaluable work? There are many fundamental research problems in the rubber industry which can only be tackled with prospects of real success by an organisation such as the R.A.B.R.M., and it is our considered view that such problems are of the highest importance to the continued development and prosperity of the rubber industry both in relation to home markets and competitive markets abroad. The R.A.B.R.M. has become a valuable link between the rubber grower and the manufacturing industry; it has an information bureau which is quite unique, and a journal—the " Summary of Current Literature" —which as a comprehensive digest of papers in rubber science and technology, has no rival.

With regard to the Bill which is now before Parliament, may we point out that the " India-Rubber Journal " (March 25, 1933) referring to the annual report of the Department of Industrial and Scientific Research said: " It appears to us that the desiderata premised by the advisory council in regard to a levy or cess are fulfilled by the attitude of the trade to the Research Association of British Rubber Manufacturers. There is more than a substantial majority of the firms in the industry in favour of the compulsory principle, and it is not unreasonable to believe that the adhesion of 80 to 90 per cent. of the industry may be regarded as full support for the Rubber Industry Bill." It is also pointed out by your contemporary that the principle and practice of a levy or cess are neither new nor exceptional.—Yours faithfully,

P. SCHIDROWITZ, Ph.D., F.C.S., F.I.R.I.
(Hon. Tech. Adviser, Institution of the Rubber Industry, etc.)
H. P. STEVENS, M.A., Ph.D., F.I.C., F.I.R.I.
(Consulting Chemist to the Rubber Growers' Association, etc.)

Imperial Chemical Industries Report

Definite Increase in Turnover in 1932

THE report of Imperial Chemical Industries, Ltd., for the year 1932, to be presented at the sixth ordinary general meeting at the Central Hall, Westminster, on Tuesday next, April 11, confirms the preliminary statement issued in March and reviewed in THE CHEMICAL AGE of March 18 (page 245), announcing a gross income of £6,415,423, against £4,668,685 in the previous year. The report states that the difficulties of 1931 were somewhat ameliorated during 1932, partly by the benefits derived from the abandonment of the gold standard and the adoption of the Import Duties Act. It is yet early to gauge the effects of the Ottawa agreements. There was a definite increase in turnover as compared with 1931. This increase, together with the economies effected throughout the entire organisation and the fact that new capital spent for the purpose of improving efficiency is having increasing effect, are responsible for the general improvement.

The home trade sales of alkali products showed a satisfactory improvement, and in spite of less business from China, a result of the disturbed conditions prevailing there, the total volume of trade in export markets was somewhat better than in 1931. In chlorine products and acids there was also an increase and satisfactory progress has been made with some of the newer developments.

Marked Improvement in Dyestuffs

The volume of sales of dyestuffs showed a marked improvement upon the preceding year, both in home and export markets. The arrangement with the Continental makers referred to last year has operated smoothly and helped to stabilise prices both at home and abroad. A further reduction in the coal output and the curtailment of public works caused a slight diminution in home sales of explosives. Demands from the export markets, however, increased sufficiently to bring the total volume of trade up to the level of 1931.

Sales of nitrogenous fertilisers showed a slight increase on the preceding year. As was stated last year all efforts to formulate a world agreement to regulate the manufacture of synthetic nitrogen failed. It is therefore satisfactory to record that in July last the important European producers entered into an arrangement covering the fertiliser year ending June 30, 1933, which it is hoped may lead to an agreement of a more permanent nature. Products other than fertilisers manufactured by the fertiliser and synthetic products group showed satisfactory increases in volume of sales, and several new products advanced to the stage of routine manufacture and sale, thus making the Billingham factory more independent of the fertiliser market.

Leather, Lime and Metals

The general trade of the leather cloth group was satisfactory, sales both at home and abroad being slightly in advance of those recorded for 1931. In spite of decreased activity in the building and allied trades, and the depressed state of agriculture, the trade in the lime group's products showed no fall from that of the preceding year. Non-ferrous metal sales showed a satisfactory expansion, both at home and abroad. The increased demand from the motor and electrical industries in the home market was somewhat offset by stagnation in ship-building and by reduced demands from the railway companies. Export trade showed a marked improvement, particularly in India and South America.

Sporting ammunition business was good. Although financial stringency and a poor shooting season combined to render home sales disappointing, export trade substantially increased, the lower sterling exchange having widened markets in which trade was formerly difficult. Improved methods of manufacture have enabled prices again to be reduced. The demand for "Lightning" fastener continued to develop in spite of competition, and sales further advanced. Cellulose paint and varnish sales substantially improved on the previous year; several new products were introduced with considerable success.

In the overseas markets of the Far East, India, Levant, South America and elsewhere, the selling companies maintained and developed their business in face of many difficulties. The company's interests in the Dominions continue to advance satisfactorily. During 1932 the depression in Canada was accentuated, and as a consequence the results of the business of Canadian Industries, Ltd., fell below those of the previous year. Relatively to the trade of the country, however, that company has satisfactorily progressed. African Explosives and Industries, Ltd., again had a good year, the results being better than for the preceding year. The supply of explosives to the gold mines showed a further small increase, though the depression in agriculture caused a fall in the sales of fertilisers.

The determined efforts made by the Commonwealth of Australia to deal with the financial situation have been attended with a considerable measure of success. Sales by Imperial Chemical Industries of Australia and New Zealand, Ltd., have been maintained, and notwithstanding increased taxation that company showed better results.

Interest in Subsidiary Companies

The following details of shares and debentures in and advances to and from subsidiary companies is given in the report:—

	Book Value in the Balance Sheet		Increase or Decrease
	Dec. 31, 1931	Dec. 31, 1932	
	£	£	£
Shares and Debentures in Subsidiary Companies in which the Company holds over 50% of the shares, or control	57,265,239	61,740,385	4,475,146
Add Advances to them for Capital Expenditure and General Development	20,051,098	20,209,822	158,724
	77,316,337	81,950,207	4,633,870
Deduct Amounts written off ...	1,837,596	3,935,675	2,098,079
	75,478,741	78,014,532	2,535,791
Deduct Debts due to them	6,213,763	11,706,393	5,492,630
Total Interest in Subsidiary Companies	£69,264,978	£66,308,139	–£2,956,839

A review has again been made of the assets of the subsidiary companies and it has been decided to apply £3,517,404 of the central obsolescence and depreciation fund and £418,271 of the general reserve to writing down values in the books of the subsidiary companies, a corresponding reduction being made in the book value of the "Shares and debentures in and advances to subsidiary companies." The other changes reflected in these figures follow the continued consolidation and financial reorganisation of the manufacturing groups.

The general policy of consolidation has been carried a step further by the liquidation of some of the smaller subsidiary companies. During 1932 I.C.I. (Explosives), Ltd., and I.C.I. Metals, Ltd., have each taken over from Imperial Chemical Industries, Ltd., in exchange for their own shares, the shares of the various subsidiary companies manufacturing explosives and non-ferrous metals respectively. These latter companies will be liquidated in future years as and when expedient.

A decrease in holdings in associated companies arises from transactions involving writing off excess values to the extent of £250,037 and re-payments in reduction of capital by a foreign company, less further calls in respect of partly paid up capital.

Marketable and Other Investments

During the year the holding of Australian Commonwealth Stocks was transferred to Imperial Chemical Industries of Australia and New Zealand, Ltd., in settlement of outstanding liabilities involving a reduction in the book value of the holdings of marketable and other investments. Ascertained losses amounting to £56,692 have been written off. The

book value of marketable and other investments, excluding Government securities, is £8,858,130. Furthermore, the home subsidiary companies hold similar investments to a total book value of £421,147, making in all £9,279,277. Owing to the further fall which has taken place in the Stock Exchange prices, the market value, or computed value in the case of unquoted investments, is £3,940,278 less than the book value.

The directors are of opinion that market quotations are still abnormal. Until the world economic and financial situation is more settled they consider it premature to alter the book value of these investments. The general reserve amply covers the fall in value.

Financial Results

All factories have been maintained in a state of high efficiency; the necessary provision has also been made for depreciation of wasting assets, minor services and contingencies and a few of the companies have provided in their own accounts for depreciation on fixed assets. The total cost in 1932 of these charges was £2,256,901, which has been charged against the profits of the year. Stocks have been valued at cost or market value, whichever was the lower. Provision for income tax has been made in this year's accounts of the subsidiary companies to cover the increase of profits in 1932. Where exchange restrictions prohibited the transfer home of cash representing foreign dividends, no credit has been taken for such dividends, which, however, are unimportant in amount.

The directors recommend a final ordinary dividend of 3½ per cent., making 6 per cent. for the year, leaving a balance of £543,770 to be carried forward to 1933.

The authorised capital is unchanged at £95,000,000. The total nominal issued capital amounted to £77,148,334 at December 31, 1932, an increase of £50,139 on the amount issued at December 31, 1931. This small increase is due to the issue of capital in exchange for further shares in subsidiary companies.

Cash at bankers, in hand and invested in British Government securities at December 31, 1932, amounting to £7,076,269, compares with £4,222,900 at December 31, 1931, being an increase of £2,853,369. The market value of the securities at the date of the balance sheet was somewhat in excess of book value. The central obsolescence and depreciation fund has been augmented by the appropriation of £1,000,000 and a further £500,000 has been added to the general reserve, both out of the year's profits. The obsolescence fund has also been strengthened by the transfer of £1,000,000 from general reserve. The total of the amounts written off, amounting to £4,387,404, has been provided by applying the central obsolescence and depreciation fund to the extent of £3,662,404 and by withdrawing £725,000 from general reserve. This leaves £4,000,000 in the central obsolescence and depreciation fund apart from like reserves of subsidiary companies and £9,500,000 in general reserve at December 31, 1932.

Competition between Coal and Oil

British Science Guild Symposium

A SERIES of papers was read before the British Science Guild on March 27 on "The Economic Significance of Coal." Capt. Bernard Acworth, reading the first of these papers, said that in Great Britain in the past twenty years the demand for fuel had increased. The output of coal, on the other hand, had decreased from 287,000,000 tons in 1913 to less than 220,000,000 in 1931. Considerably more than 67,000,000 tons of British coal had thus been replaced by oil. During this period the change over on sea and land from coal to oil had adversely affected our national trading balance by £960,000,000. The Royal Navy, coal-fired until 1907, was now oil-fired. The Merchant Marine, coal-fired before 1907, now contained approximately 9,000,000 tons of Diesel and oil-fired ships. In the case of flying, whether military or civil, a Government subsidy had been supplied, the only private money involved being the fares actually paid, and the private capital invested in aerial transport companies.

Coal and the Gas Industry

Mr. Stephen Lacey said that the part played by the gas industry as an instrument in the efficient utilisation of coal was almost invariably under-rated. The industry was 120 years old, and it was natural, perhaps, that an industry thus well past its centenary should lose a good deal in its popular appeal. The investor had grown to take for granted the security of the 200 millions sterling invested in gas supply undertakings, and equally the consumer takes for granted the arrival of gas at the tap. Fortunately for the community the gas industry thrived in spite of its lack of novelty, and would continue to thrive, given enterprising and unfettered development, because its economic basis was sound.

"Coal for Sea Transport" was the title of a paper given by Engineer Rear-Admiral W. Scott-Hill. He said that where a raw product of home origin and high quality existed, it was to a country's advantage to use it in every possible way rather than to import a substitute. In coal, these islands had such a raw product in ample and readily won quantity, and of a quality not excelled by that found in any other country. But the development of proper means of burning oil in ships, in which development the navy played a pioneer part, sea transport had been offered a reduction of firemen, a convenience in clean bunkering, which could be carried on without interfering with other work in and about the ship, and these advantages, together with its convenient stowage, have established "fuel in a liquid form" as the only fuel for fighting ships, and as commercially economical for certain passenger vessels and other ships running on regular services, where cleanliness and quick turn round are of first importance. However, raw coal could by suitable hydrogenation treatment, be converted into oil, and the liquid from low temperature carbonisation could be converted into fuel by hydrogenation. Coal was actually able to provide every kind of fuel for sea transport, whether hand-fired, powdered fuel, oil, Diesel oil, or colloidal fuel, but the cost in the light of present knowledge of hydrogenation would be prohibitive. Quantity, too, was another story, and so long as only a small part of the raw coal burnt in this country was treated before being used, oil had to be imported to make up the difference.

Liquid Fuel and Sea Transport

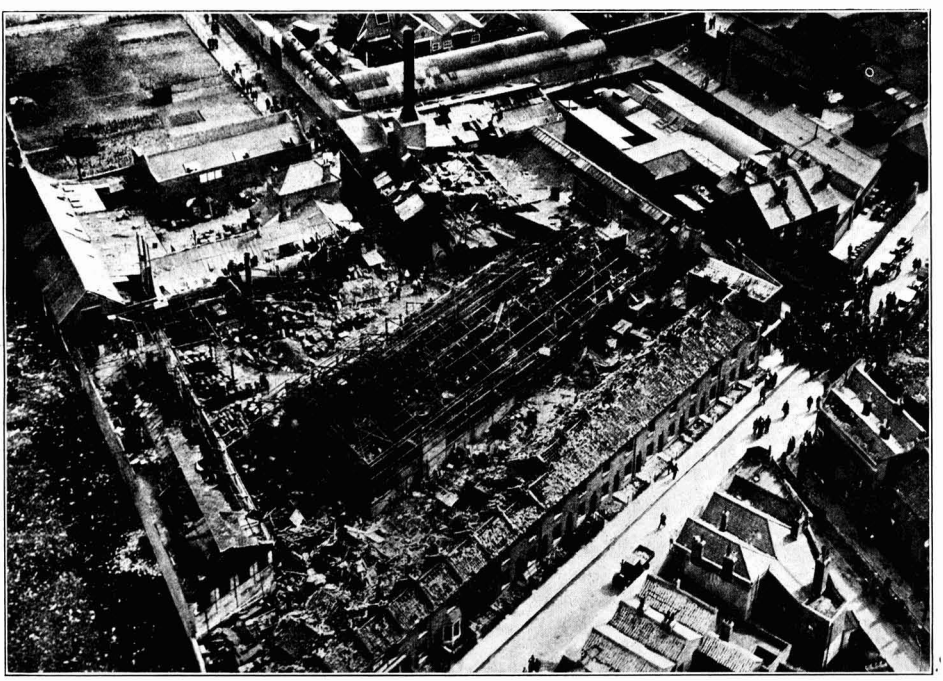
Mr. A. C. Hardy said that the increasing use of oil for maritime purposes must be unpalatable to those who visualised an eventual return to pre-oil era conditions in the mercantile marines of the world. Such a return was, as a matter of fact, quite impossible as long as sea transport retained its present characteristics. Even if the dearest wishes of the back-to-coal movement were realised in this country, no other maritime country could be expected to follow suit, and our mercantile marine, already embarrassed by the placing of fine modern oil-driven vessels on world trade routes by other nations might well be swept out of economic existence by sheer weight of operating superiority of its rivals. The back-to-coal movement would do well to restrain the ambitions of the marine engineer. Granting all the advantages which would accrue if Britain's coal industry could be fully rehabilitated, it seemed that the real question was whether or not we were justified in creating an artificial handicap against oil in favour of coal. If the "Little Englanders" were to have their way and prosperity was to be written entirely in terms of home markets, it might be possible to weight the scales in favour of coal, although the already heavily burdened taxpayer will then have to foot the bill. If Great Britain was to remain Great Britain, and if her merchant fleet was to continue to serve the world, it must be maintained at maximum operating efficiency. Since independent experience on the high seas had demonstrated the superior advantages of oil fuel for marine propulsion, both in Diesel engines and in modern steam plants, either geared turbine or turbo-electric, it would be contrary to the best interests of the country as a whole to expect the British shipowner engaged in international trade to take on a deliberate burden in order to favour one domestic industry which was suffering from obsolescence.

The Mitcham Chemical Works Explosion

Attributed to a Defective Bolt

THE explosion which occurred on March 30 at the chemical works of W. J. Bush and Co., Ltd., at Batsworth Road, Mitcham, and which was briefly reported in THE CHEMICAL AGE last week, was one of the worst in the London area since the war. The remarkable feature of the explosion, however, was that in spite of the widespread damage only one person was killed—a schoolboy of 11 who was crushed beneath a falling ceiling in a house near the works. According to the evidence at the inquest on Wednesday the explosion was due to a defective bolt in a still used for the distillation of methylated spirit at the works, which permitted inflammable vapour to escape, with disastrous results.

The explosion, which occurred about 7 o'clock in the morning, shook the entire neighbourhood, blew off the roof of the works and bulged in the walls of the main buildings. Some



An aerial view of the Mitcham Chemical Works of W. J. Bush and Co., Ltd., after the explosion, showing the extent of the damage to surrounding property.

30 people were injured, including three men employed at the works, who were removed to hospital. About 25 houses and one or two small shops in Belgrave Road were wrecked, and a number of houses in other roads near the works were extensively damaged.

The Inquest

The inquest on Thomas Frederick Adaway, the victim of the explosion, was held on Wednesday, by Mr. E. Lovell Hewitt, acting-coroner for East Surrey. Also in attendance were Mr. H. W. Younger, H.M. Superintendent of Factories, and Mr. L. C. McNair, H.M. Engineering Inspector of Factories. Mr. H. J. Murphy represented W. J. Bush and Co., Ltd. The Coroner said the inquiry into the boy's death necessarily involved an investigation into the reasons for the explosion. An explosion of such magnitude caused serious damage to property, but that was not the concern of that court. Its chief concern was to find the reason for the explosion in order that any recurrence would be obviated.

Evidence was given by the boy's father, and Dr. Patrick Lahill said death was due to shock following a fracture of the skull and laceration of the brain. It appeared that his head struck something with great force, or something heavy fell upon his head.

George Knowles, a process engineer in the employ of W. J. Bush and Co., Ltd., said there was no night shift at the works, the men coming in at 6 a.m. It was his duty to look after the still.

The Coroner: Were you the sole person charged with the duty of looking after the still?—Yes, with the exception of the manager who was not there at the time.

Knowles said that the still was working from about 6 o'clock until the time of the explosion, distilling methylated spirits. It was not working night and day. He went to the still at 6.30 a.m. to start it up, and turned on the steam very gently. He then left it, but returned in a few minutes to see how it was working. He found it was working all right, and then went into a building adjacent, the still being in the open yard. A few minutes later, he returned again, and found it all right. As he was walking down the yard, he met a fellow workman named Catlin, and together they noticed a "fog" coming from the still. They both went towards it, and saw that the fumes were coming from the back of the still. They went back to try to turn the steam off, but they could not get at the valve because of the fumes. They could not understand what it was, so they rushed to turn off the electricity, gas and steam in the building. All the men were in the yard by this time, and the fumes were coming out all this time. They rushed to get the hosepipe, but they could not get it on to the pipe as the explosion occurred at that moment.

The Coroner: Can you say where the explosion started?—It was all too quick to see where it came from.

The Coroner: What lights were there in the factory at

that time?—There were no lights except those in the boiler.

In answer to Mr. McNair, Knowles said there was a jacket in the still, the rest of the still being made of copper. There was a 10 lb. pressure on the steam jacket, but they had had no trouble with this still. Every light in the factory was turned off except that of the boiler.

Questioned by Mr. Murphy, Knowles said he had been working on the still ever since he came to the works. He was working on it the day before the explosion, and he actually shut it off on March 29, and it had been working quite normally up to then. When he started it on March 30 it worked normally. He was quite satisfied that all the lights were turned off, and there was a considerable distance between the still and the boiler.

The Coroner: Did you smell vapour strongly before the explosion?—Only near the still. Knowles added that the 10 lb. pressure on the steam jacket was when it was just warming up. The gauge was last examined about a month previous, the maintenance engineer being responsible for that.

Frank Catlin, the maintenance engineer employed at the works, said the first he heard about the incident was at about 6.50 a.m. As he went by the still it was working quite normally. It was his duty to keep his eyes open to look for trouble. He went on with some drilling about 25 ft. away from the still, using an electrically-driven machine. About a quarter-of-an-hour later he walked up the yard, when he met Knowles who drew his attention to the fumes. He rushed to shut off the steam, but the fumes were so strong that he could not get near.

The Coroner: What kind of fumes did they appear to be?—A white cloud, or a white fog, so thick that you could not see through it.

The Coroner: Was it because of the density that you could not get near?—No, the fumes were choking, and you could not get any breath.

The Coroner: Could you tell from the smell what the fumes were?—It smelt of spirits, methylated spirits.

Two Years in the Open Air

The Coroner: Where did the explosion seem to start; was it the centre?—There did not seem to be any start or centre of it, it all started at once.

Catlin said the still had been standing out in the yard in the open roughly about two years. It was made of copper, apart from the steam jacket which was of cast iron. There was one pressure gauge on the steam jacket. The evaporation was taken up through a receiver.

Questioned by Mr. McNair, Catlin said that never at any time was there any suggestion of a stoppage, and there was no evidence of any stoppage. Extensive pressure could not possibly be got in the steam jacket. At the back of the still on the copper itself there had formerly been a connection. There was a flange of iron, covered with lead, with an asbestos washer, the flange being about 7 in. in diameter. This was fastened to the still by six bolts. This was periodically examined by him, the last time being about a month ago. He took off the flange, examined it, and renewed the bolts.

A bolt found after the explosion was handed to the witness to examine, and he expressed the opinion that there was a flaw in the bolt. In view of this it was possible that the fumes got between the asbestos sheeting and the still. In answer to the Coroner, he said he did not think the fumes reached the boiler house, because all the men were standing in the yard quite near to the boiler, and the fumes had not reached them.

Mr. McNair: Can you say whether there were any lights on in the building?—I cannot say, but some men were working in the building. All the fumes used in this process ran back by an underground tank into the yard.

The Coroner: Do you know of any fire or plant which was working on the premises at the time that this explosion occurred, which would have caused a spark?—There was nothing.

Catlin said no men were smoking, as there was an order about that, and a large notice painted on the wall just inside the works. All the work-people observed the order. All the other five bolts which connected this flange were in position and in good condition after the explosion.

Other evidence was called, including that of Arthur Allen Windea, a chemical labourer, who said he arrived at the works an hour before his time to help somebody in connection with some powder which they called M.G. They were working at the other end of the yard. He was just carrying out some powder, to go into the still. On approaching the still he noticed this "stuff" coming from it. He could not breathe very freely. He dumped the powder from his shoulder, and walked to the other end of the yard, and met his fellow workmen standing there. The explosion happened almost at once.

The Works Manager's Evidence

Mr. Fredk. Horace Priest, works manager, said he was not at the factory when the explosion occurred.

The Coroner: Have you ever known of an escape of vapour from the still referred to in your yard?—No, never before.

The Coroner: Have you known of escapes of vapour from other stills of the company?—No, not to my memory.

Mr. Priest said that if the vapour escaped it was very volatile. All the men had instructions what to do if the vapour escaped.

The Coroner: You have heard that they tried to turn the steam off, but could not get near. Is there any kind of prevention in the nature of a mask?—Yes, there is a mask. The men were about to get the mask and hosepipe, but had no time to act.

The still, continued Mr. Priest, was exposed to atmospheric conditions, but it did not deteriorate because it was made of copper. The still was strongly built, and could stand considerable pressure. When these bolts were put in there was a fitter inside and a fitter outside. One of these might have given the bolt a twist just to decide and it had been left hanging on by the thread. In his opinion the heat during the day when it was working, on the Wednesday, and the cold night had an effect of contraction and expansion on the bolt.

The Coroner: Would that account for the leak?—Quite. Witness added that he did not think there was anything else that might have accounted for the explosion.

In answer to Mr. Murphy, Mr. Priest said he had been employed at the works for 38 years, and the works had been there 50 years. He had never heard of any previous explosion.

A juror: Was there an explosion at this factory about 15 or 16 years ago?—No.

No One to Blame

The Coroner said that further witnesses could be called if necessary, but three of them were in hospital. The jury said they did not need any further evidence. Addressing the jury, the Coroner said that a number of people had seen this vapour escaping from the still, but they were unable to get to the still because of the fumes. As to the source of the escape of vapour, the only evidence was in connection with the bolt, which was found to have come apart from the other five after the explosion. The connection to the still might have opened sufficiently to allow the liquid or vapour to escape, and thus caused the explosion. They had heard that this bolt was one of six of similar type, and had been renewed about a month before. If they thought that it was due to some flaw in the bolt, which was not freely visible, it was not a matter for which they could hold any person blameworthy. There was no light in the works except those in the boiler house. Their verdict would be a simple one, as there was no evidence of any light except those in the boiler house, and the possibility of those in the houses adjoining, which would have ignited the vapour.

After a short retirement, the jury returned a verdict of "Accidental Death," and added that they wished to appreciate the conduct of the police in carrying out their hazardous duties, and also to express their sympathies with the parents of the boy.

Mr. Murphy, on behalf of the firm, said he wished to associate the firm with the jury's sympathies.

Home Secretary's Statement

In the House of Commons on Monday, Mr. W. Thorn (Plaistow) asked the Home Secretary whether he had caused inquiries to be made into the explosion; whether any financial indemnity was being paid to tenants in respect of injuries received and loss of household effects; if he would state the

date of the last visit to the works by a factory inspector and arrange to inspect a similar factory in the vicinity; and whether he would consider taking steps to prevent any similar factories being built adjacent to residential villas.

Sir J. Gilmour, the Home Secretary, replied that immediate steps were taken by the Factory Department to inquire into the explosion, one of the engineering inspectors with special knowledge of chemical works being detailed for the purpose, and he assured Mr. Thorn that the fullest possible investigation would be carried out. On the question of indemnification, he understood that active steps were being taken by the firm with a view to an expeditious settlement of claims, and that meanwhile all immediate needs were being satisfactorily met from the local relief fund. The works were last visited by factory inspectors on December 12 last. While there were, of course, a number of works where inflammable materials were in use, there was no other factory in Mitcham doing similar work, but if Mr. Thorn would let him know the name and address of the factory which he had in mind he would be glad to arrange for a special inspection. As regards the last part of the question, all he could say at present was that the whole position would be most carefully reviewed when the full results of the inspector's inquiries and the proceedings at the inquest were available.

Mr. R. J. Meller (Mitcham) asked the Home Secretary what provision had been made to house the families rendered homeless by the explosion.

Sir J. Gilmour: I am informed that those of the families rendered homeless who required accommodation are being housed in the old Holborn Poor Law school at Mitcham.

Mr. Meller asked whether the Home Secretary was aware that that accommodation was only temporary and quite inadequate and whether facilities would be afforded for the proper housing of the people in the shortest possible time.

Sir J. Gilmour: That is not the duty of the Home Office, but anything we can do in that direction will be gladly done.

Chemical Industry Lawn Tennis Tournament

A May Day Reminder

ALL men engaged in any capacity in the chemical industry in Great Britain are eligible to enter the Chemical Industry Lawn Tennis Tournament. Inaugurated by THE CHEMICAL AGE in 1931, the tournament is extended this year to include singles as well as doubles, and the entries already received serve to indicate that the decision to include the singles competition is a popular one. There is no entrance fee and the only restriction is that in the case of the doubles, each pair must be members of the same or an associated firm.

Entries must be received at the offices of THE CHEMICAL AGE, Bouverie House, Fleet Street, London, E.C.4, not later than Monday, May 1, but there is no need to wait for the closing date. It would facilitate the arrangements for the dates of the various rounds if entries could be received as early as possible. Copies of the rules, which have been published in full in the two last issues of THE CHEMICAL AGE, together with entry forms may be obtained on application, either personally, by post or by telephone, to the Editor (City 0244).

The draw for the first round will be made as soon as possible after the closing date for entries, and it is hoped that full particulars of the draw will be published on May 6. Players drawn against each other will make their own arrangements for playing their matches on a court mutually agreed upon. In the event of disagreement the player or pair first drawn will have the right to choose the ground. As in previous years there will be a new draw for each round. In the early stages of the tournament the country will be divided into areas, the geographical limits of which will depend upon the number of entries from each locality, in order that the difficulties of travelling may be minimised.

THE CHEMICAL AGE silver challenge cup, presented by the proprietors of THE CHEMICAL AGE and at present held by W. Speakman and S. E. Chaloner (Monsanto Chemical Works, Ltd., Ruabon, North Wales) will be awarded to the winners of the doubles, and a similar trophy will be provided for the winner of the singles. There will also be miniature cups to be presented outright to the winners and to the runners-up.

Wages of Workers in the Chemical Industry

Union's Reply to Employers' Decision

FOLLOWING the decision of the Drug and Fine Chemical Manufacturers' Association not to enter into a new agreement with the Chemical Workers' Union in substitution of the agreement which expired on March 31, a national conference of stewards employed in all works in the drug and fine chemical section of the chemical industry was held in London on April 2. Reports presented at the meeting showed that since the Association's decision had been made public, 34 firms (eight members of the Association and 26 non-members) had intimated that they would not vary existing wages, conditions and factory practices as specified in the old agreement and that factory negotiations on questions arising with stewards and factory committees would be continued as before. An official statement from the Union states that "this declared attitude of some employers indicates that there exists a widespread disapproval of the employers provocative action and makes it certain that no widespread national stoppage is likely to arise over the fundamental question of Union recognition, and that such stoppages as arise will be confined to about eight firms who have been traditionally hostile to the Union and who may attempt hostile acts against Union members. In six of these firms Union membership is strong enough for members to defend themselves."

The most important decision was a resolution that the Union executive should prepare a new national programme embodying, among other matters, minimum wages—£4 men, £2 women, 40 hour week, 12 days annual holidays, restriction of juvenile labour, elimination of second process workers and counter-men, and the preparation of a schedule of poisons to be handled only by adults—male and female. Another national conference is to be held to endorse the programme.

In a letter to the Drug and Fine Chemical Manufacturers' Association formally acknowledging the decision not to enter into a new agreement, Mr. A. J. Gillian, secretary of the Chemical Workers' Union, wrote:—

"Your Association's arbitrary decision leaves nothing but acceptance on our Union's part. The alleged grounds for your Association's action cannot be accepted as anything but an apparent distortion of facts in seeking an excuse to cloak many other and more valid reasons for breaking off wages and conditions regulations with our Union. . . . . My executive council interprets your Association's action as an attempt to deny to large numbers of Union members employed in factories owned by members of your Association, their fundamental rights to collective bargaining through an organisation of their choice, and against such action they register their most emphatic protest. In order to safeguard our members' interests until such time as negotiations are resumed and another agreement arrived at between your Association and our Union, the executive council of the Union has formally adopted as minimum acceptable Union conditions, all wages, conditions, privileges, interpretations and practices thereto, as specified in the expired agreement. Our members employed in factories owned by members of your Association have been called upon to resist any prejudicial changes in any of the said wages, conditions, etc. etc., attempted or enforced without consultation or consent of our Union's officers as their only bona-fide representatives."

Chemical Notes from Overseas

Potash Prices Reduced in Poland

THE "Towarzystwo Eksploatacji Soli Potasowych" (Company for Exploitation of Potassium Salts) has reduced the prices of potash salts for domestic consumption by 15 per cent. The majority of the shares of this company are owned by the National Economic Bank. The present reduction of 15 per cent. and a previous reduction made on November 1, 1932, lowers the price of potassium salts by 23 per cent. on cars at works.

Chilean Iodine Sales Decline

ALTHOUGH Chile continues to be the largest single source of iodine production, from the figures available it would appear that the Chilean product has suffered the loss of a greater percentage of consumption than has the product of other nations. Based on the average for the four years, 1922-1925, Chile contributed in the neighbourhood of 70 per cent. of the world's consumption whereas for the four year period, 1928-1931, that country, presuming the sale of Chilean iodine to the Iodine Combine as representative of the approximate consumption from stocks, supplied an average of less than 60 per cent.

Hungarian Chemical Industry

TO offset the loss of foreign outlets for industrial chemicals or products for which they are used, local production of certain new products was undertaken in Hungary in 1931. Thirty-six plants started manufacture of new products, four liquidated, and five were closed. New plants were established for manufacture of liquid ammonia, lithopone, nitric acid and derivatives. In addition there were five other new plants for insecticides, varnishes, solvents, medicinals, while nine plants enlarged capacity. Fertiliser manufacture has been suspended for 18 months while sulphuric acid output dropped from 7,000 carloads to 800. Other industries are running under curtailments up to 50 per cent. Factories producing chemicals for the textile, leather, fur, and paper industries are in a comparatively favourable position.

Synthetic Waxes in Germany

A NUMBER of synthetic waxes, known as "I.G. waxes," have been on the German market for some time and become established in many industrial uses, although such artificial products are still sold at higher prices than the natural. "I.G. waxes" include several varieties of different consistencies and chemical properties. The products may be grouped in three classes corresponding, respectively, to Carnauba wax, beeswax, and stearine. Their affinities to the several natural waxes are more in the sense of similarity of industrial uses than with regard to chemical or physical characteristics. It is stated that the synthetic waxes of the Carnauba group may be employed, without any reservations, in all those cases where Carnauba wax is used in industry, particularly in the manufacture of shoe polishes. The waxes of the beeswax type are used in sizes, finishing preparations, and for candles and cosmetics. The stearine type, "I.G. Wax S," is employed in candle manufacture.

German Paint and Varnish Industry

THIS industry, unlike many of the others, is somewhat resistant to the influence of business cycles. While statistics covering production of paint and varnishes in 1932 are not obtainable, trade estimates place the total output at a 25 per cent. decrease in comparison with 131,272 metric tons produced during 1928. German exports of paints and varnishes have been one of the most important groups in foreign trade and the development since 1925 has been spectacular. Total exports of this group during 1925 was 3,891 metric tons, valued at 6,316,000 marks, which quantity increased to 9,835 metric tons, having a value of 23,065,000 marks in 1929. The following two years exports fell off considerably and for the first ten months of 1932 exports had fallen to 5,401 metric tons, having a value of 8,326,000 marks. Distribution of German exports are, over the whole world, the most important customer, the Netherlands accounting for less than 10 per cent. of the total. Other important exports markets are France, Denmark, United Kingdom, Sweden, and Switzerland.

United States Bauxite Industry in 1932

SHIPMENTS of bauxite from mines in the United States in 1932 were 96,349 long tons, valued at £109,700, a decrease of 51 per cent. in quantity and of 52 per cent. in total value, as compared with 1931. Bauxite is found chiefly in Arkansas, and also in Alabama, Georgia and Tennessee. The shipments from Arkansas were mainly for use in the chemical industry, followed in order by the aluminium and abrasive industries. The producers of domestic bauxite reported sales during 1932 at prices ranging from 16s. 8d. to £2 10s. 6d. a long ton.

Production of Paint in Yugoslavia

DURING the past year, the domestic paint and varnish industry in Yugoslavia has developed considerably. The industry comprises six large plants, most of which are branches of a parent German or French concern and are doing a satisfactory business. Although all grades of paint, varnish, and lacquer are produced and the industry is afforded high protection, it is unable to cover domestic demands with the result that the better grades of paint products are imported. The Moster paint and varnish factory at Zagreb, which is the largest manufacturer, has a capacity of 1,800 metric tons of paint, 400 tons of varnish, and 900 tons of lacquer.

The Labelling of Paint Containers

THERE has recently been a considerable imitation of brands of goods in the Straits Settlements, and the local police have formed a special section to deal with it. In connection with this misbranding, it is probable that within a few months laws will be enacted in the Straits Settlements, Federated and non-federated Malay States, requiring all goods imported in cans, packages, or bottles to bear a statement, on the label or container, indicating the country in which the goods were manufactured or packed. While no such laws have been promulgated or even introduced into the legislative council, it is stated that the police intend pressing such legislation. There is little doubt that if proposed it would be enacted and become effective.

The Roumanian Alkali Industry

PRIOR to the war, there was no production of alkalies in Roumania. Since the acquisition of Transylvania with its alkali plants, the industry has assumed considerable importance. The Solvay Co., with two plants in Transylvania, is the only company in Roumania which manufactures caustic soda, and sodium carbonate. There are, however, minor concerns which manufacture sodium sulphate. Roumania's total production of alkalies during 1931 was as follows: Caustic soda, 9,410 metric tons; sodium carbonate, 17,756 tons; and sodium sulphate, 741 tons. The above production practically satisfies the local demand and in 1931 exports of alkalies from Roumania amounted to 530 tons of sodium carbonate. Both of the principal raw materials, salt and limestone, are found in large quantities. The total capital invested in the Roumanian alkali industry amounts to 398,776,000 lei (£660,000).

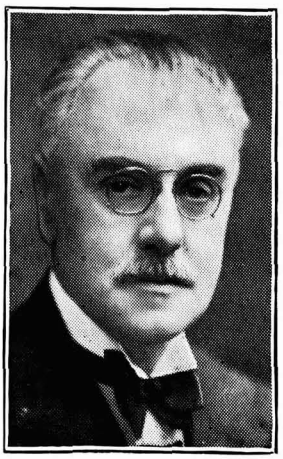
Mineral Acids in France

FRENCH sulphuric acid production during 1932 continued at about the same level as in the previous year, largely because of the Government's action in placing a quota on imports. At one time Belgian competition was much feared—the Belgian sulphuric acid production is largely a by-product of zinc while in France the acid is obtained principally from pyrites. The shutting down of coke ovens, the sharp drop in sales of superphosphate and reduced sulphate of ammonia production, all have contributed to reduce the outlets for sulphuric acid. On the other hand, the artificial silk, textile, and petroleum industries have somewhat increased their consumption. The consumption of hydrochloric acid continued to decline, particularly in the manufacture of gelatine and for use in the metallurgical industry. Consumption of nitric acid, however, was maintained. The principal outlets were in the manufacture of explosives and in the production of nitrogenous fertiliser products, which, to some extent, replaced imported fertilisers. The explosives branch of the chemical industry seems to continue on an almost normal basis, even with the situation in the mines of Northern France far from satisfactory.

Chamber of Commerce President

Mr. Andrew Home-Morton Honoured

MR. ANDREW HOME-MORTON, until recently managing director of the Hoffman-La Roche Chemical Works, Ltd., Palmers Green, N., was last week unanimously elected president of the Southgate Chamber of Commerce. Mr. Home-Morton, who joined the Hoffman-La Roche Company in 1923, formerly had a distinguished career as a consulting engineer, and was president of the Birmingham Association of Mechanical Engineers in 1914-15. During the war he was engaged in the laying down of new factories and the extension and re-arrangement of old ones for the production of munitions. In 1915 he joined the International Rotary movement, was president of the Rotary Club of London in 1917, and, in 1918-19, president of Rotary International Association for Great Britain and Ireland (R.I.B.I.).



Mr. ANDREW HOME-MORTON

Modern Dyeing

Research for Standardised Fastness

AT the annual dinner of the Society of Dyers and Colourists at Leicester, on March 31, Mr. Thorp Whitaker, the president, responding to the toast of the society, said it might be claimed that the dyeing process of to-day had been much simplified by the use of synthetic colours. Comparing the dyers of yesterday and to-day, however, it must be borne in mind that, with simpler methods of working, the requirements of the public as to shade, fastness to light, and other considerations were infinitely more severe to-day. To-day most dyers had some chemical knowledge, but in old days a works chemist or a laboratory was rare.

There could be no doubt, added Mr. Whitaker, that the formation of the Society had been of great benefit to the trade generally, and it was advisable for firms to encourage their younger men to become members. The society had helped the industry in many ways, particularly in the latest research on methods of standardised fastness. It was decided, in the first place, to investigate the problems of fastness to light, washing, and perspiration. Arrangements were made with the Wool Industries Research Association for the experimental work to be carried out in their laboratories as regards fastness to light and washing, and the co-operation of Professor McSwiney, of the Leeds Chemical School, was secured for the work on perspiration. Hundreds of dyed patterns had been exposed to sunlight in many parts of the world during the last three years, and unsuitable colours had been eliminated. Many failures and setbacks had been overcome, until now a series of colours had been agreed upon as tentative standards. Regarding the fastness of colours to perspiration, researches had been both thorough and interesting.

Society of Chemical Industry

Preliminary Programme for Newcastle Meeting

ARRANGEMENTS are well in hand for the fifty-second annual meeting of the Society of Chemical Industry, which is to be held at Newcastle-on-Tyne, from July 10 to 14. Details have yet to be arranged in connection with visits to works and other excursions, but the main outline of the programme has been completed. The arrangements are in the hands of the Newcastle Section of the Society. The Newcastle Chemical Industry Club is inviting those who attend the meeting to become honorary members for the period of the meeting. Following is the preliminary programme:—

Monday, July 10.—Registration at Armstrong College. 7.30 p.m.—Informal gathering in King's Hall—Music, dancing, and light refreshments.

Tuesday, July 11, 10 a.m.—Council meeting. 11 a.m.—Annual general meeting. Civic welcome by Lord Mayor. Welcome by the Principal, Sir William Marris. PRESIDENTIAL ADDRESS. 1 p.m.—Lunch by invitation of the Newcastle Section. 2.30 p.m.—Chemical Engineering Group meeting. Papers by Messrs. King and Pearce. Simultaneously, ladies' excursions to places of interest in the city. Arrangements made in conjunction with Society of Antiquaries. 8 p.m.—Civic reception.

Wednesday, July 12, 9.30 a.m. to 11.—Plastics Group meeting, open to all. Addresses by Dr. B. Rassow, Leipzig, and other speakers. 11.15 a.m.—Presentation of Society's Medal and address by medallist. 12.15 p.m.—Visit to Roman Wall via Hexham or Chollerford.—7.30 p.m.—ANNUAL DINNER.

Thursday, July 13, 10 a.m. to 12.—Open meeting of Food Group. Opening address by Sir John Russell: "How Science can help the Nation to produce more of its own Food." 1 p.m.—Unofficial lunch. 2 p.m.—Works visits and excursions. 8 p.m.—Reception by Sir William Marris, Sir Cecil Cockrayne, M.P., and College Council.

Friday, July 14, 10 a.m.—Visit to Imperial Chemical Industries at Billingham. Lunch and tea provided at Billingham by the company. Party limited to 100. Other works visits and excursions, probably including visit to Farne Islands.

Plastics Industry Exhibition

A Novel Display of Materials and Moulded Articles

ON Wednesday, April 5, Mr. H. Ramsbotham, Parliamentary Secretary to the Board of Education, deputising for Lord Irwin, President of the Board, opened the plastics industry exhibition which has been arranged at the Science Museum, South Kensington, under the direction of the British Plastic Moulding Trade Association.

The object of this exhibition is to introduce plastic materials to other industries as well as to the public who do not use them at present. It comprises a comprehensive collection of articles produced from the various plastic materials on the market to-day, illustrated according to their application, and grouped into the various industries in which they are at present used. There is also a collection of research specimens indicating development of synthetic resins, together with two education exhibits illustrating the production of several plastic materials. Another section is devoted to a collection of the various plastic materials, including moulding powders of the phenolic, cellulose ester, cellulose ether and urea types, casein, natural resins and synthetic resins of various types. In the centre of the exhibition a room has been erected, in which the furnishings and fittings are made entirely of plastic material.

The exhibition is intended to suggest, by example, how plastic materials can be employed with benefit in industries which at present do not employ them at all, or only to a small extent. These include many basic industries which experience trouble with better known materials now employed; amongst such industries are coal mining, metallurgy, ship building, automobile, aircraft, railway and other heavy engineering. One of the outstanding features is a working hydraulic press, actually engaged on the production of moulded goods. Scale models of plant installations employed in the manufacture of moulding materials, as well as types of moulds and examples of the steel used in their fabrication are also exhibited.

News from the Allied Industries

Artificial Silk

THE PRODUCTION OF RAYON YARN and waste in the United Kingdom in February was 5.43 million pounds, comparing with 5.93 million pounds in January and 6.52 million pounds in February, 1932.

Mineral Oil

THE END OF THE PRESENT SESSION of the World Oil Conference is now believed to be in sight. The determined refusal of the Roumanians to agree to a further decrease in their quota has been agreed to in principle, and they will be allowed to retain their production of 18,500 tons daily, but it is understood that the duration of the agreement may not be for three months.

Soap

REPORTING A THIRD SUCCESSIVE RECORD YEAR at the meeting of John Knight, Ltd. (controlled by Lever Bros.), held on March 31, Mr. C. P. D. Ward, the chairman, mentioned that the board had decided during the year to concentrate to a greater extent upon proprietary lines advertised by publicity and gifts. As part of this policy, and also in order to secure what the board regard as a more stable investment, the company has exchanged its interests in various subsidiaries for preference stocks of Lever Bros. This explains the big change-over in the balance-sheet from "shares in subsidiary companies" to "investments." The company has recently introduced "But-ol," a new frying oil, of which favourable reports have been received.

Iron and Steel

LATEST AVAILABLE FIGURES for the United Kingdom show that at the end of February 63 blast furnaces were in operation, or more than at any time since the end of June, when 69 were at work—a figure that shrank to only 56 in July. During March two blast furnaces have blown in at Skinningrove and one has been blown out on the North-West Coast. There is therefore a gain of one furnace in action, and it is expected that two others at Redbourn will be started shortly.

THE QUIET CONDITIONS which have ruled of late in the iron and steel markets have been accentuated by developments in the Continental steel trade, says the official report of the London Iron and Steel Exchange. The announcement that the European steel cartel proposes to establish international selling offices for the control of semis and several descriptions of finished steel was followed by the withdrawal of practically all the Continental works from the market. Some business has been diverted to British works, but in the majority of cases buyers are awaiting fresh developments and the new prices which it is understood the sale offices will quote.

THE PROCESS OF RATIONALISATION is steadily proceeding in the iron and steel industry. An agreement which has now been reached between Richard Thomas and Co., the steel and tinplate manufacturers, and the Whitehead Iron and Steel Co. marks another very important stage of this development. Under the terms of the agreement billets will be supplied by the former from their Redbourn steel works at Scunthorpe to the Whitehead rolling mills at Newport, Mon. Arrangements also have been made for the erection of continuous bar and strip rolling mills at the Redbourn works. These mills will be the joint property of the two companies. Substantial economies should result from this arrangement, which will also provide a large number of additional orders for the Redbourn works. It is hoped that the present plant will be in full production before the end of June. As a further step towards closer co-operation between the two undertakings, Mr. L. D. Whitehead, the chairman and managing director of the Whitehead Iron and Steel Company, has accepted an invitation to join the board of Richard Thomas and Co. The share capital of Richard Thomas and Co., Ltd., is £9,000,000, and that of the Whitehead Iron and Steel Co., Ltd., £360,000. At present the Redbourn plant, when engaged at full capacity, can give employment to about 1,400 men. This reopening will mean a gradual absorption of a large number of Scunthorpe's 3,000 unemployed.

Safety Glass

THE DIRECTORS of Acetex Safety Glass, Ltd., report that they have considered the investigation committee's report, and advise shareholders that the recommendations contained therein be adopted. The report discloses the fact that the company has made trading losses since June 30, 1932. At an adjourned meeting held on April 5, a resolution was unanimously passed for the appointment of an accountant to investigate the position of the company and make recommendations to the shareholders. It was agreed to appoint Sir Basil Mayhew, of Mayhew, Barton and Co.

Paper

AN ISSUE AT PAR of £700,000 new 4½ per cent. first mortgage debenture stock of Bowater's Paper Mills, Ltd., is to be made. The new stock is being issued to replace the existing £750,000 6 per cent. first mortgage debenture stock, which is to be repaid on January 1, 1934, at 103 per cent. The balance required for redemption will be provided out of the company's resources. Holders of the old stock are to be given the right to convert their holdings into the new stock, and to receive a cash payment in respect of the difference between the repayment and issue prices. Shareholders and debenture-holders may apply for any portion of the new stock not required for the purposes of conversion.

British Oil and Cake Mills

Dividend Maintained

SPEAKING at the annual general meeting of the British Oil and Cake Mills, Ltd., held in London, on March 29, Mr. J. W. Pearson, chairman and managing director, said that the trading results for the past year were not so good as those for the previous 12 months, but, in view of the general conditions, they would no doubt be considered satisfactory. The available balance of £542,615 permitted the payment of the full 12½ per cent. on the preferred ordinary shares and of 8 per cent. on the ordinary shares owned by Lever Brothers, Ltd., with the carry forward increased by about £1,000. The company's total output during the year showed quite a reasonable increase. While there was an appreciable reduction in the deliveries of single-seed cakes, those for compound cakes and similar foods substantially increased, the combined total for 1932 being about 4 per cent. heavier than for 1931. The year had been full of interesting events for the seed crushing industry.

At the company's last annual meeting—when the new Import Duties Act had just come into force—he pointed out that the main raw materials, *viz.*, linseed, cottonseed, rapeseed, and soya beans, had been put upon the free list, while a certain measure of protection was afforded in the 10 per cent. duty imposed on all cakes and oils imported from other than Empire sources. The immediate effect of this was to transfer to the United Kingdom a certain amount of crushing business hitherto done in North Europe, and there was no doubt that the total volume of material handled by British mills would have been very much larger than in the year before but for the heavy reduction in the size of the Indian groundnut crop. Unfortunately, the industry had now been placed in serious difficulty owing to the agreements entered into at Ottawa. Pressure from the Indian Government representatives brought about a change which resulted in linseed being taken off the free list, and this meant that, while seed from the Empire could be imported free of duty, linseed brought in from Argentina, the main source of the world's supply, would have to pay 10 per cent. Representations had been made to the Import Duties Advisory Committee for an additional duty on the imports of linseed oil, and the directors hoped that before long the committee might see their way to recommend the appropriate changes in order that the linseed crushing trade might not be lost to the United Kingdom. The import of margarine and special oils for the manufacture of margarine had practically ceased, as a result of which additional manufacture in Great Britain was finding extra work for the mills.

Inventions in the Chemical Industry

Specifications Accepted and Applications for Patents

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

Specifications Accepted with Dates of Application

TREATMENT OF HYDROCARBON MATERIAL AND PARTICULARLY THE CRACKING OF SUCH MATERIAL.—Trinidad Leasehold, Ltd., W. B. Heaton and F. L. Melvill. Oct. 27, 1931. 389,871.

METHOD FOR TREATING MATERIALS capable of undergoing dispersion in water, and for obtaining aqueous dispersions therefrom.—Colas Products, Ltd., L. G. Gabriel, J. F. T. Blott, W. L. Peard, L. W. G. Firmin, L. Meunier, and J. L. Van Der Minne. June 18, 1931. 389,810.

PRODUCTION OF COLOURED PRODUCTS.—J. F. Thorpe, R. P. Linstead, J. Thomas and Scottish Dyes, Ltd. June 20, 1931. 389,842.

DISAZO DYESTUFFS.—Imperial Chemical Industries, Ltd., and M. Mendoza. Sept. 21, 1931. 389,818.

PRODUCTION OF PLASTIC SUBSTANCES.—Deutsche Gasglublicht Auer Ges. Oct. 23, 1930. 389,852.

MANUFACTURE OF ALIPHATIC ANHYDRIDES.—H. Dreyfus. Sept. 24, 1931. 389,835.

METHODS FOR CLEANING OR DEGREASING MATERIALS.—J. Savage and Imperial Chemical Industries, Ltd. Sept. 24, 1931. 389,837.

DYEING WITH AZOIC COLOURS.—Bleachers' Association, Ltd., C. S. Parker, C. L. Wall, and F. Farrington. Sept. 25, 1931. 389,853.

RECOVERY OF GOLD FROM MINERALS.—F. B. Jones and Minerals Separation, Ltd. Sept. 25, 1931. 389,865.

PRODUCTION OF MOULDABLE RUBBER COMPOSITIONS.—Improved Textile Rollers, Ltd., and H. McGhee. Sept. 30, 1931. 389,873.

TREATMENT OF CELLULOSE CARBOXYLIC ESTER MATERIALS.—H. Dreyfus. Sept. 30, 1931. 389,876.

MANUFACTURE AND PRODUCTION OF VINYL KETONES.—J. Y. Johnson (I. G. Farbenindustrie). Oct. 3, 1931. 389,884.

PROCESS FOR TREATING IRON OR STEEL or their alloys for use for apparatus exposed to the action of hydrogen or gases containing same at elevated temperature and pressure.—Vereinigte Stahlwerke Akt.-Ges. Oct. 22, 1930. 389,887.

COATING COMPOSITIONS AND THE LIKE.—F. H. Reichel. Dec. 15, 1930. 389,914.

MANUFACTURE OF DYESTUFF PREPARATIONS.—I. G. Farbenindustrie. Dec. 2, 1930. 389,915.

PROCESS FOR PURIFYING OILS and for converting heavy, incombustible oils into homogeneous fuels.—A. Haeck and J. Spiltoir. Dec. 12, 1931. 389,925.

DESTRUCTIVE HYDROGENATION OF CARBONACEOUS MATERIALS.—Chemical Reactions, Ltd. (Deutsche Gold und Silber-Scheideanstalt vorm. Roessler). Jan. 1, 1932. 389,937.

MANUFACTURE AND PRODUCTION OF AGENTS FOR COMBATING PLANT PESTS.—J. Y. Johnson (I. G. Farbenindustrie). Jan. 18, 1932. 389,951.

Applications for Patents

DYESTUFF INTERMEDIATES.—A. W. Baldwin, A. H. Knight and Imperial Chemical Industries, Ltd. March 29. 9517.

LIQUIDS OF PLASTIC PREPARATIONS.—H. Bertsch. March 27, 9210.

MEANS OF SEPARATING AND COLLECTING DUST PARTICLES AND GLOBULES OF LIQUID FROM GASEOUS FLUIDS.—T. B. Collins. March 31. 9697.

MANUFACTURE OF AZO DYESTUFFS.—E. I. Du Pont de Nemours and Co. March 30. (United States, March 30, '32.) 9651.

MANUFACTURE OF POLYMERISATION PRODUCTS FROM ALIPHATIC COMPOUNDS.—J. V. Eyre and H. Langwell. April 1. 9878.

MANUFACTURE OF COMPOUNDS HAVING GERMICIDAL, ETC., PROPERTIES.—W. W. Groves (Monsanto Chemical Works). March 30. 9621.

TREATMENT OF FUEL SPIRITS AND LUBRICATING OILS.—W. Helmore. March 30. 9533.

MANUFACTURE OF ANTHRAPYRIMIDINES.—I. G. Farbenindustrie. March 27. (Germany, Sept. 17, '32.) 9176.

MANUFACTURE OF VAT DYESTUFFS OF ANTHRAQUINONE SERIES.—I. G. Farbenindustrie. March 27. (Germany, March 26, '32.) 9191.

TREATMENT OF CARBONACEOUS MATERIALS WITH HYDROGENATING GASES.—I. G. Farbenindustrie. March 29. (Germany, Aug. 26, '32.) 9407.

DYEING ANIMAL FIBRES.—I. G. Farbenindustrie. Dec. 7, '32. (Germany, Dec. 7, '31.) 9493 (cognate with 34678/32).

MANUFACTURE OF WATER-INSOLUBLE AZO DYESTUFFS.—I. G. Farbenindustrie. March 31. (Germany, April 1, '32.) 9802.

MANUFACTURE OF WATER-INSOLUBLE AZO DYESTUFFS.—I. G. Farbenindustrie. March 31. (Germany, April 2, '32.) 9803.

DYESTUFFS.—I. G. Farbenindustrie. April 1. (Germany, April 1, '32.) 9882.

MANUFACTURE OF TEXTILE ASSISTANTS.—Imperial Chemical Industries, Ltd. March 27. 9219.

Prices of Chemical Products

Current Market Conditions

THE London chemical market continues along quietly steady lines with nothing of outstanding interest to report. Prices remain steady and practically unchanged. New contract commitments for delivery over the next three months have been reported in some sections of the Manchester chemical market during the past week, but forward buying of any consequence is the exception rather than the rule, and the bulk of the moderate business that is being placed just now is for relatively near deliveries. With regard to prices, fluctuations this week have been of minor extent and have not been numerous. On the whole values keep remarkably steady. Business still continues to be brisk in the Scottish heavy chemical market, and numerous home and export inquiries are being received. With the following exceptions, the prices of chemical products remain as reported in THE CHEMICAL AGE of March 25 (pages 274-275).

General Chemicals

ACID, CITRIC.—LONDON: 10d. per lb.; less 5%. MANCHESTER: 9½d.

ACID, LACTIC.—LANCASHIRE: Dark tech., 50% by vol., £24 10s. per ton; 50% by weight, £28 10s.; 80% by weight, £45; pale tech., 50% by vol., £28; 50% by weight, £33; 80% by weight, £53; edible, 50% by vol., £41. One-ton lots ex works, barrels free.

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

ARSENIC.—LONDON: £22 14s. c.i.f. main U.K. ports for imported material; Cornish nominal, £23 f.o.r. mines. SCOTLAND: White powdered, £25 ex wharf. MANCHESTER: White powdered Cornish, £23 10s. at mines.

PHENOL.—9d. to 10d. per lb. nominal.

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, 8¼d.

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 per ton f.o.b.

Pharmaceutical and Fine Chemicals

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

AMMONIUM BENZOATE.—3s. 6d. per lb.

Coal Tar Products

ACID, CRESYLIC.—99/100%, 11d. to 1s. 8d. per gal.; pale 95%, 11d. to 11½d.; dark, 10d., all according to specification; refined, 1s. 7d. to 1s. 8d. LONDON: 98/100%, 1s. 3d.; dark, 95/97%, 11d. SCOTLAND: Pale 99/100%, 1s. 3d. to 1s. 4d.; 97/99%, 1s. to 1s. 1d.; dark, 97/99%, 11d. to 1s.; high boiling acid, 2s. 6d. to 3s.

CREOSOTE.—B.S.I. specification, 2½d. to 3d. per gal. LONDON: 3d. to 3½d. f.o.r. North; 4d. to 4¼d. London. MANCHESTER: 2½d. to 3½d. SCOTLAND: Specification oils, 3¾d. to 4¼d.; washed oil, 4d. to 4¼d.; light, 3¾d. to 4¼d.; heavy, 4¼d. to 5d.

PITCH.—Medium soft, £4 10s. per ton. MANCHESTER: £4 to £4 5s. f.o.b. LONDON: £4 5s. to £4 10s. f.o.b. East Coast port.

Wood Distillation Products

ACETATE OF LIME.—Brown, £8 10s. to £8 15s. per ton. Grey £13 to £14. Liquor, brown, 30° Tw., 6d. per gal. MANCHESTER: Brown, £1; grey, £12.

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

From Week to Week

THE CHEMICAL AGE will go to press a day earlier than usual next week, owing to the Easter holidays. All matter intended for insertion in that issue should reach us not later than by first post on Wednesday morning.

ASSOCIATED DYERS AND CLEANERS, LTD., states that its transfer office is now at the registered office, Acton Vale, London, W.3.

A COMBINATION of British, Dutch and American capital will develop the oilfields in New Guinea shortly, if negotiations between the Government of the Dutch East Indies and the Bataafsche Petroleum Maatschappij are successful. This company is a member of the Royal Dutch-Shell group.

IT IS ANNOUNCED that the synthetic fertilisers' cartel agreement reached last year at Basle has been prolonged after further agreement on points of detail. Since this agreement, unlike that of 1930, did not include the Chileans, it may be concluded that Chile still remains outside the cartel.

CHARLES HOPE AND SON announce that as from April 1, the business of H. W. Jewesbury and Co. is amalgamated with their own firm. They are taking over the Jewesbury staff and all outstanding contracts in rubber. Hope's statement adds that Mr. J. K. L. Fletcher, the sole partner of Jewesbury and Co., will be joining the firm.

THE ECCLESIASTICAL COURT of Jersey on March 31 granted permission for extensive alterations and improvements at St. Mathew's Church, Millbrook, Jersey, to perpetuate the memory of the late Lord Trent of Nottingham. The cost is being defrayed by Florence Lady Trent. Lord Trent was the founder of the firm of Boots Cash Chemists.

AT THE ANNUAL MEETING of the Federation of British Industries on Wednesday, Sir George Macdonogh was elected president for the ensuing year, in succession to Sir George Beharrell. The vice-presidents were re-elected with the addition of Mr. G. B. Luke, who is a director of the Linen Thread Co., Ltd., and chairman of the Scottish committee of the Federation.

A CYLINDER OF LIQUID CHLORINE, which was being carried by lorry from Newcastle to West Lothian Paper Mills, exploded at East Linton, Haddingtonshire, on Tuesday, and was found half a mile away. The force of the explosion was such that the ceilings of several houses collapsed and the windows were shattered. The lorry and its contents were destroyed. The driver had left the lorry to seek assistance owing to an outbreak of fire.

IN THE COMPANIES COURT, on Monday, Mr. Justice Maugham had before him a petition by Transport (1910), Ltd., of 33 Tothill Street, Westminster, for the compulsory winding-up of Nor-Rust Liquid Lead Co., Ltd. This was a judgment creditor's petition for £113. Counsel said a meeting of the creditors had been held, and all agreed, except the petitioning creditors, to a moratorium for six months on the undertaking that 6s. 8d. in the £ was paid in three months. The matter stood over for a week.

THE DEATH IS ANNOUNCED of Mr. James Wood, M.A., B.Sc., F.I.C., the joint head of the Research Department of the Co-operative Wholesale Society. Mr. Wood was a graduate and research student of Aberdeen University and afterwards an assistant to the Lancashire County Analyst at Liverpool. He came to the C.W.S. on the formation of the department in 1917 and was in charge of all the important work connected with foodstuffs supplied by the C.W.S. and the co-operative movement. Mr. Wood was a member of the Society of Public Analysts and vice-chairman of the Northern section. Aged 53.

A SURPRISE SUSPENSION OF WORK occurred at the headquarters of Pullar's Dye Works, Perth, on Tuesday, the trouble following notices issued to each department intimating that, in accordance with the Board of Trade cost-of-living figures, there would be an all-round reduction in wages. Many workers ceased work. The situation was eased by an announcement that an explanation would be given later by the managing director, who was in London that day. Officials pointed out that, as the Board of Trade figures had dropped, it followed automatically, both in England and Scotland, that there would be a reduction in dyers' wages. The decreases range from 1s. for women and 2s. 6d. for men.

THE ANNUAL MEETING of the Chemical Engineering Group of the Society of Chemical Industry will be held on Friday, April 28, at the Waldorf Hotel, London. Lord Melchett, as principal guest, will speak on "Modern Economics and Unemployment." A few tickets (price 12s. 6d.) will be available to non-members in due course. These tickets can be obtained on application to the office of the Group at Abbey House, Victoria Street, Westminster. Among the guests will be Dr. R. H. Pickard, president of the Society, Lord Leverhulme, Sir Hugo Hirst, Sir Frank Smith, Mr. W. A. S. Calder, Dr. E. F. Armstrong, Dr. R. T. Colgate, Mr. E. A. Alliott, Mr. H. J. Pooley, Dr. L. H. Lampitt and Mr. H. V. Potter.

BRITISH SUMMER TIME commences at 2 a.m. on Sunday. All clocks should be put forward one hour to-night (Saturday).

MR. HENRY BOTT, late of the Pilkington-Sullivan chemical works at Widnes, died on March 31, at the age of 68. Mr. Bott had been the recipient of a gold watch and medal and chiming clock, for long service, having completed half a century with the United Alkali Co. and Imperial Chemical Industries, Ltd.

TWO GRADUATES OF THE MANCHESTER UNIVERSITY have been recommended for election to Fellowships of the Royal Society, Dr. J. E. Lennard-Jones, recently appointed to the Plummer Chair of Inorganic Chemistry in the University of Cambridge, and Dr. Alan S. Parkes, Foulerton Student of the Royal Society.

FIRE DESTROYED PART OF THE WORKS of the Yorkshire Tar Distillers, Ltd., at Stourton, Leeds, on Saturday evening. The research department, hydrogen plant and carbolic acid plant, were destroyed, this section of the works being reduced to a shell within an hour of the outbreak. The extent of the damage has not yet been ascertained.

ON HIS RETIREMENT from the firm of James and Rosewall, paint manufacturers, etc., of Plymouth, which he joined as a clerk at the age of 20 and had served for 61 years, Mr. Charles D. Phillips was on March 31 presented by his fellow employees with a mahogany tea truck. The gift was presented to Mr. Phillips by Mr. J. W. Clooke. The managing director, Mr. W. L. Van de Kasteele, presented Mr. Phillips with a chafing dish.

FINSBURY TECHNICAL COLLEGE Old Students will hold their second informal dinner at Stone's Chop House, Panton Street, Haymarket, on April 27, immediately following the Kelvin lecture at the Institution of Electrical Engineers. Old students intending to be present should communicate with the secretary, F. R. C. Rouse, c/o Venner Time Switches, Ltd., Kingston By-Pass Road, New Malden, Surrey.

SIR FREDERICK KEEBLE, F.R.S., Controller of Agricultural Research, Imperial Chemical Industries, gave a lecture at the Royal Institution on March 31, on "The Nitrogen Hunger of the World." Sir Frederick said that no plant was receiving as much nitrogen as it could do with, and the sea was also deficient. He believed that disease could be traced in the last analysis to deficiency of nitrogen.

THE VACUUM OIL CO., at a meeting on March 30, in London, of representatives of motorists and the motor industry, announced that a new variety of the Mobiloil engine lubricant will henceforth be available to users of cars and other motor vehicles of all makes and models. Before putting the new Mobiloil on the market the Vacuum Oil Co. has had the various grades subjected to a number of exceptionally strenuous tests, first by the technical department of the Royal Automobile Club and then by the National Physical Laboratory.

MR. JOHN FRANCIS QUEENY died at his home in St. Louis, United States, on March 19, at the age of 74. Mr. Queeny was a well-known figure in American chemical circles, his connection with the industry covering a period of over sixty years. He founded the Monsanto Chemical Co., St. Louis, over thirty years ago, and by his courage and industry, lived to see it grow to its present importance, operating seven plants in America and two in England. It was only two years ago that Mr. Queeny retired from active control of his vast interest, after spending some time in the successful development of the Monsanto Group in Great Britain.

DR. J. T. DUNN was unanimously elected president at the annual general meeting of the Newcastle Chemical Industry Club, to fill the vacancy caused by the death of Mr. Robert Bowran. Professor G. R. Clemo, Mr. Clive Cookson and Mr. Arthur Kelly were elected vice-presidents. Mr. B. P. Hill, chairman, moved a vote of thanks to contributors of books and periodicals to the library, and emphasised the great utility of the library to the industries on Tyneside. Mr. P. D. Scott was elected hon. librarian and Mr. F. H. Walker as hon. secretary. On the motion of Professor Henry Louis, it was agreed to invite visitors to the annual meeting of the Society of Chemical Industry, to be held in Newcastle in July, to be honorary members of the Club.

MR. H. T. F. RHODES, editor of the British Association of Chemists' monthly organ, the "Chemical Practitioner," delivered a lecture on "The Future of Science in Civilisation" at a meeting of the British Association of Chemists and kindred organisations at the Derby Technical College on March 30. The present world situation, he said, offered a great opportunity to science to step in and take charge. The difficulty of building a new Britain and a new Europe was not due to the fact that people did not know what they wanted. It was rather that the issues were obscured by an instinctive adherence to formulae which were utterly out of date. Once men's minds had been relieved of that bondage, the issues would stand out clearly and the goal would be in sight.

Forthcoming Events

Apr. 10.—Institution of the Rubber Industry (London Section). "The Effect of Modern Materials on Architectural Design." R. A. Duncan. 7.30 p.m. First Avenue Hotel, High Holborn, London.

Apr. 10.—The Ceramic Society. Annual general meeting. "Speedy Methods of Ascertaining Moisture Contents." Stephen Stanworth. 7.30 p.m. North Staffordshire Technical College, Stoke-on-Trent.

Apr. 10.—Institution of the Rubber Industry (Manchester Section). "Coagulation of Latex and Latex Mixings for Industrial Purposes." R. G. James. Reynolds Hall, College of Technology, Manchester.

Apr. 11.—Society of Glass Technology. King's Head Hotel, Sheffield. Apr. 12. Sixteenth annual general meeting, University, Sheffield. 2 p.m.

Apr. 11.—Institution of Petroleum Technologists. "An Analytical Steam Distillation for Measuring the Volatility Range of Lubricating Oils and other High-Boiling Petroleum Fractions." R. N. J. Saal and C. G. Verver. 5.30 p.m. John Street, Adelphi, London.

Apr. 12.—Institute of Chemistry (Belfast Section). Visit to Richardson's Chemical Manure Co., Ltd.

Apr. 13.—Institute of Metals (London Section). Annual general meeting and open discussion. 7.30 p.m. 83 Pall Mall, London.

Apr. 13.—Oil and Colour Chemists' Association. "The Effect of Storage on the Plasticity of Paints." S. A. de Lacy. 7.30 p.m. 30 Russell Square, London.

Company News

Canadian Industries, Ltd.—A dividend of 1¾ per cent. on the 7 per cent. cumulative preferred stock for the quarter ending March 31, 1933, is payable on April 15.

Consolidated Mining and Smelting Co.—The total earnings for the year 1932 were $18,096,000, compared with $23,966,000 in the previous year. The balance of profit and loss is now $1,418,000.

Yorkshire Dyeing and Proofing Co.—It is announced that the directors consider it advisable to conserve resources and await results of the year to the end of June before considering the question of payment of a dividend.

International Aluminium Co.—For the year 1932 a profit of £52,625 is announced, and £15,473 was brought in. Debenture interest, directors' and trustees' fees take £21,298, provision for taxation £13,356 and preference dividend for the year £17,371, leaving £16,071 to be carried forward.

Borax Consolidated, Ltd.—The directors have decided to postpone payment of the dividend on the 6 per cent. preferred ordinary shares until the accounts for the full financial year, terminating September 30 next, are available. No dividend has been paid on these shares since 1929.

Gas Purification and Chemical Co.—The net profit for the year 1932, was £2,818, against £3,672. To this is added £4,346 brought in, making £7,164. To reserve is placed £2,000; the dividend of 5 per cent. absorbs £2,875, interest on debentures £84, leaving to be carried forward £2,205.

Aluminium Corporation.—The trading profit for 1932, after providing for depreciation, was £22,337, and after payment of debenture and mortgage interest, and directors' fees, and making provision for debenture stock redemption, the net profit was £1,208, which, deducted from balance of £21,185 brought forward, leaves a debit of £19,977 to carry forward.

Tharsis Sulphur and Copper Co.—It is reported that the directors have decided not to pay a dividend from the profits of 1932, but to carry forward the balance at the credit of profit and loss account of £71,037, after writing off £22,750 for depreciation. For 1931 there was a dividend of 5 per cent., the net profit amounting to £62,577.

British Drug Houses, Ltd.—The directors recommend a dividend of 5 per cent., less tax, on the ordinary shares for the year 1932. No dividend was paid on these shares for the year 1931. The profits for the past twelve months were £60,303, compared with £36,381 in the previous year. The annual meeting will be held at the Midland Hotel, St. Pancras, London, on April 12, at 12 noon.

Magadi Soda Co.—After providing for obsolescence and debenture interest, profit and loss account for the year 1932 show a loss of £19,505. The sum of £16,381 has been charged during the year on account of obsolescence on buildings and plant, and the total reserve on this account at December 31, 1932, amounted to £80,579. Debenture interest for the year has been paid and charged at the rate of 4 per cent., in accordance with the moratorium scheme approved by the debenture-holders on July 8 last. Further calls have been made during the year on the preferred ordinary and on the ordinary shares of the company, the former now being 3s. paid, while the latter are fully paid. Calls in arrear, amounting to £2,396, are solely on account of 12½ per cent. preferred ordinary shares, and steps have been, and are being, taken to recover amounts outstanding in appropriate cases.

New Chemical Trade Marks

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

Opposition to the registration of the following trade marks can be lodged up to April 29, 1933.

Genic. 538,980. Class 2. Chemical preparations for disinfecting and deodorising air. Hygienic Air Purifying Co., 7 and 9 Green Lane, Derby. February 10, 1933.

Granny's. 538,544. Class 1. Mineral dyes. The United Indigo and Chemical Co., Ltd., Union Buildings, Chapel Walks, Manchester. January 25, 1933.

Silerone. 536,222. Class 1. Chemical substances used in manufactures, photography, or philosophical research, and anti-corrosives. I. G. Farbenindustrie, Grüneburgplatz, Frankfort-on-the-Main, 20 Germany. October 31, 1932.

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).

British West Indies.—An old-established agent at Barbados desires agencies on commission, purchasing or consignment basis, for fertilisers. (Ref. No. 493.)

Belgium.—A firm established at Liége wishes to obtain the exclusive representation of United Kingdom manufacturers of bitumen and tar for roads, on a commission or consignment basis. (Ref. No. 503.)

Belgium.—The head of a firm of wholesale dealers in coal, oils, etc., wishes to obtain the representation of United Kingdom manufacturers of castor, groundnut and olive oils; household soap (including mottled), on a commission basis. (Ref. No. 504.)

Canada.—A newly-established manufacturers' agent in Montreal, who has represented for some years United Kingdom, Canadian and American firms in Colombia (South America) for paints, chemicals, metals, etc., desires to obtain United Kingdom agencies for the sale of chemicals and drugs, soaps and toilet preparations, perfumery, druggists' sundries, leather goods, on a commission basis throughout Eastern Canada, that is, the Provinces of Quebec and Ontario and the three Maritime Provinces. (Ref. No. 495.)

Egypt.—The Commercial Secretary to the Residency, Egypt, reports that the Egyptian Ministry of Agriculture is calling for tenders, to be presented in Dokki by April 20,1933, for the supply of: 10 tons of calcium arsenate (Meritol), 2 tons of copper sulphate, 69.8 tons of sodium cyanide, 260 tons of sulphuric acid, 8,200 lbs. of nicotine sulphate in 10-, 2- and ½-lb. containers. (Ref. F.X. 1741.)

New Companies Registered

Chromo Products, Ltd., 36 Ashbrook Road, Highgate, London, N.19. Registered March 23. Nominal capital £300 in £1 shares. Electro platers, nickellers, silver platers, etc. Directors: David Henry and Percy J. Craddock.

Durium Varnishes, Ltd. Registered April 3. Nominal capital £1,000 in £1 shares. Objects: To prepare and treat paper and other materials and substances with a preparation known as "Durium" to manufacture, import and deal in "Durium," to make paint and varnish, etc. A subscriber is Dudley D. C. Giddins, 78 Great Winchester Street, London, E.C.2.

Brick Trust, Ltd., 1 London Wall Buildings, London, E.C.2. Registered April 3. Nominal capital £100 in 1s. shares. Objects: To acquire from Germaine Pechin née Lacroux and Louis Pechin of Bois-Colombes (Seine) France, the benefit of and turn to account certain existing inventions relating to a process for preparing transparent artificial resins by condensing phenols and formaldehyde. Directors: C. K. George, and Mary Calder.

Ross (Gelatines), Ltd., St. Helens Works, Newlay, Leeds. Registered April 1. Nominal capital £8,000 in £1 shares. Manufacturers of and dealers in gelatine, glue, size, and other gelatinous substances, tanners, curriers and leather dressers, manufacturers of and dealers in leather goods, manufacturers and finishers of and dealers in artificial silk, cloth, baize and wool and goods made or prepared therefrom, etc. Directors: William Ross and Charles F. Webster.

W. J. Brown (Bristol), Ltd. Registered April 1. Nominal capital £7,500 in £1 shares. Objects: To acquire the business carried on at Compton Martin, near Bristol, as "W. J. Brown," and to carry on the business of bone merchants and crushers, seed crushers, manufacturers of linseed, cotton and other cakes, artificial manures and fertilisers, oil refiners, soap boilers, and manufacturers, glue and gelatine manufacturers, tanners, dealers in hides, tallow and other animal products, pharmaceutical, manufacturing and general chemists and druggists, etc. A subscriber is Wilfrid J. Brown, St. Davids, Beaconsfield Road, Knowle, Bristol.

Pinchin, Johnson & Co. Ltd.

Increased Output in 1932

MR. EDWARD ROBSON, chairman, speaking at the annual general meeting of Pinchin, Johnson and Co., Ltd., on March 31, said that there had been a decreased demand from the principal basic industries due to the general depression throughout the world, but in spite of that fact, the firm's output had increased by many hundreds of tons. Owing, however, to the lower price averages obtained, the monetary value of sales was less. The company's subsidiaries in India, Australia, and the Argentine produced substantially increased profits. The most severe marketing problem had been in the Central European markets and in the South American states other than the Argentine, and, considering the extraordinarily difficult conditions that had to be met in these markets, particularly the demoralisation of exchanges and currencies, the chairman thought that the firm had come through the year in a particularly satisfactory manner. Despite the increased difficulties of conducting the day-to-day business in such adverse conditions, the firm's policy of extending and reconstructing its technical and manufacturing facilities was continued, and the programme was now almost completed. The reconstruction scheme caused considerable expenditure during the past two years, but he was certain that this policy of modernising the important features, would have a marked influence on the firm's future trading position.

Mr. C. G. HEYWOOD, vice-chairman, said that viewing the year in retrospect, the firm could look back upon a solid measure of achievement. The process of factory reorganisation and re-equipment was completed and the new machinery of which the firm had the exclusive use, had been installed and justified the fullest expectations. The past year was noted for marked progress on the technical side of the business, and the work in the firm's laboratories had been most valuable. The closest possible contact on technical matters was kept up between all the firm's units.

Fifty Years' Progress

Jubilee of Watson, Laidlaw and Co. Ltd.

WATSON, LAIDLAW AND CO., LTD., makers of centrifugal machines and hydro-extractors, have recently published an illustrated booklet in celebration of their Jubilee Year, in which they show the advance made in the design of their centrifugal machines and hydro-extractors. The history of the company is briefly sketched. The late Mr. John Laidlaw started his business career in 1867, and in 1883 joined with Sir William Renny Watson in establishing the firm of Watson, Laidlaw and Co. In 1867 Mr. David McColley Weston, of Massachusetts, designed and patented a centrifugal machine which was a great improvement on other machines of this class then in use. In 1870 Mirrlees, Tait and Watson acquired the sole rights in this country for the manufacture of the Weston centrifugal, and in 1883 rights relating to the centrifugals made by them were passed on to the new firm of Watson, Laidlaw and Co., who had built works equipped with machinery specially suitable for the manufacture of centrifugal machines. Thus the firm celebrates the fiftieth year of its existence in 1933, and during that period has manufactured over 30,000 Weston centrifugals which have been sent to all parts of the world. In recent months they constructed many large installations for new sugar factories being erected in India. Accurate gauges are kept of all the parts, also complete records of all the machines manufactured, and a large stock of spare parts is carried so that orders for spare parts for any of the machines can be executed expeditiously and with the assurance that the parts will be exactly suitable for the particular machine for which they are wanted. While the main feature of the Weston centrifugal,—namely, the self-balancing principle,—introduced sixty years ago, still remains, there have been many developments as the result of practical experience and constant research, so that the present designs of Watson, Laidlaw and Co., Ltd., are of the modern character, embodying the latest advances in engineering science.