

The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

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AN index to Volume XXX of THE CHEMICAL AGE is published with this issue. It will be found inside the back cover, whence it can readily be detached for binding purposes.

Notes and Comments

Co-operation or Unification

THE question of co-operation between chemical organisations has been revived by the publication in the Journal of the Institute of Chemistry of an extract from a report of the Federal Council for Chemistry. Eighteen months ago the Federal Council submitted a draft scheme for co-operation between the scientific, technical and professional chemical organisations to the councils of the Chemical Society, the Institute of Chemistry and the Society of Chemical Industry, asking whether they could agree to the scheme in principle and, if so, inviting each body to appoint three delegates to confer on the matter with a committee of the Federal Council. The scheme was agreed in principle by the councils of the Chemical Society and the Society of Chemical Industry, and delegates were appointed. The council of the Institute, however, was unable to agree in principle but stated that it was prepared to discuss means of co-operation between the three bodies concerned, and submitted an alternative scheme as a basis for discussion.

The Federal Council thereupon invited the Institute to appoint representatives to meet the committee of the Federal Council and the three representatives each appointed by the councils of the other two societies at a conference to discuss *ab initio* means of promoting co-operation between the three constituent bodies and to report to the respective councils. This invitation was accepted. The conference and its sub-committees held numerous meetings, and submitted a draft scheme to the councils of the three bodies, inviting each to appoint three delegates to serve on a provisional chemical council. These invitations were accepted and the Federal Council has invited the Association of British Chemical Manufacturers to nominate three delegates as representatives of chemical industry to serve on the council.

Finding the Proper Machinery

WE notice that in the conversations on co-operation reported by the Federal Council there is no mention of the British Association of Chemists, which has for a long time taken a keen and intelligent interest in the promotion of closer co-operation and which, on account of its constantly growing membership, deserves to be taken into the confidence of the council. Just before the issue of the Journal of the Institute of

Chemistry we had read the views of the British Association of Chemists on this ever-recurring question of unification. The Association takes the view that the proper machinery for tackling the problem has not yet been devised. Such a conference as was organised by the Society of Chemical Industry in 1926, but one devoted entirely to discussing this question, would clear the ground, if it did nothing else. There has been no opportunity up to now to do this effectively, and it is at least obvious that the ground never has been cleared, and that the majority of chemists do not realise the real nature of the difficulties which exist. It is the old problem that most of us are agreed about the objective, but differences of opinion arise about method. It is often suggested that the real difficulty is money. Money is not a problem where there is agreement as to aim and method, and a determination to proceed.

In regard to finance the sound method is the accumulation of funds from subscriptions of the rank and file. This question turns upon policy and whether the policy is popular, or not. If it is popular, the money required will be forthcoming, made up from a large number of comparatively small sums. Large donations supplied by a few individuals remove the possibility of any guarantee that the policy to be followed is representative and acceptable. An unacceptable policy backed by unlimited reserves will fail in the end. A professional organisation differs greatly from a business undertaking. To succeed, at least under present conditions, a business undertaking must be competitive. Competitive professional organisations inevitably fail. In fine, the whole question is a matter of professional solidarity, a unity of aim among the rank and file itself. No mere organisation of a mechanical type can ultimately achieve the organic unity which is required.

Provincial Discontent

IT is almost inevitable that reference to co-operation will be made at the annual meeting of the Society of Chemical Industry at Cardiff next week, particularly in view of the fact that keen disappointment was expressed at the annual meeting of the Newcastle section of the Society (of which Dr. J. T. Dunn, president of the Society, is a member and past chairman) that the question of amalgamation was progressing so slowly. The Newcastle critics, as was shown in the report which appeared in THE CHEMICAL AGE immediately after the meeting, were no mere disaffected members wishing to

criticise for criticism's sake. Most were members of the committee, and all of them in good status within the Society. Rightly or wrongly there is a feeling, stronger, perhaps, in the provinces than in London, that this matter of co-operation or amalgamation has been discussed behind closed doors and that it has become an individual rather than a professional question. If this is true, attempts at amalgamation will continue to be abortive. Unification is no nearer and is probably further off than ever it was, and until the matter is discussed in open conference nothing can be done.

The older societies are not prospering, and while amalgamation might increase the prosperity of a number of units which were prospering already, it is no cure for a falling membership, and a financial situation which is beginning to be viewed with considerable alarm. This lack of prosperity is not due merely, or even to any great extent, to economic depression. It existed in fact, before the slump set in, and on the other hand it has never touched the British Association of Chemists, which has continued to increase in membership and to consolidate its financial position even through the worst years of the depression. Its success has not depended ultimately upon the benefits which attach to its membership, but to the fact that it is truly representative of all its members, and that it has consistently carried the policy desired by its members into effect. Professional organisations which are bureaucratically controlled—even if that control were efficient—inevitably fail in the end.

The Cinematograph in Industry

To the scientist and industrialist alike there is behind the "pictures" far more than the entertainment value which appeals to the bulk of the population. The public may delight equally in alluring Americans who, from the safe pinnacle of a picture screen, invite us to come up and see them sometimes, and in the inquisitive probing into the private lives of our greater potentates. It is, however, just those two aspects which scientists and industrialists may well take into account in their daily work—inviting the public to come and see, and inquisitive probing. Inviting the public to come and see is no new suggestion, but many films fail to be completely satisfactory. Purely technical films are generally unsatisfying because they give far too little detail. An illustration of a piece of machinery moving, for example, a crusher or a pump, demonstrates nothing save that "the wheels go round," a fact that most industrialists would be willing to take on trust. The trouble here is that the process is filmed by camera men who do not understand the process they are depicting but whose prime object is to produce a technically correct presentation of the observed motions by the aid of those principles of correct lighting and positioning that govern the production of pictures in the film studios.

There are missing many touches that the technical men of the industry could supply if they but possessed the showman's mentality. Greater care should be taken over the preparation of the pictures and every endeavour should be made to supply by the film in the many ways technically possible, all the inside information and knowledge that will make it live in the memory of those who see it. There is no better way of explain-

ing technical facts and processes than by pictorial representation, especially to foreign audiences; there is no surer way of losing their interest than by doing the job badly. We must cease to assume that because a camera expert has produced a film, the manufacturer who employs him need take no further part in the production. By all means let the camera expert take the pictures, but let the technical men plan the general outlines in order to be sure that the finished picture really shows what is wanted and gives information that will cause a technical audience to become keenly interested.

Inquisitive Probing

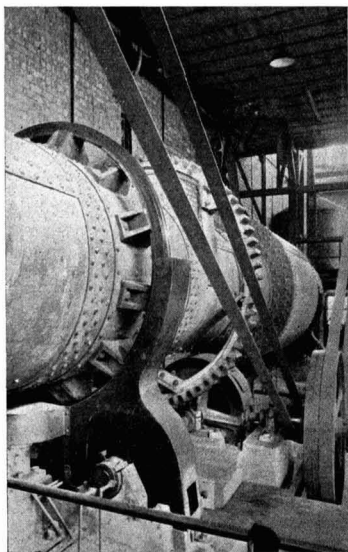
THE camera should be more often used for inquisitive probing. The cinema as an instrument of research is so much in its infancy that it may be said hardly to have been used as yet. There has just been produced a new cine-camera capable of taking 2,500 pictures a second, a rate 20 times as fast as the usual slow-motion pictures shown to the public. As the reaction of the eye to motion is of the order of seven images per second the possibilities of probing into the order of natural events are clearly immense. It is interesting, for example, to see by the aid of this camera the unexpected formations in the splash when a marble is dropped into a bowl of suitable liquid; to observe the shattering of an electric light bulb, the muscular reaction to a burn and many other similar incidents of our daily life. These however, are but demonstration experiments. We can imagine many instances where a rapid film of a chemical reaction or of a physical process will serve to elucidate what many months of experiment fails to make completely clear. We anticipate that the scientific research of the future will revert in some measure to the practice of the past wherein visual observation was preferred to precise measurement. The methods of visual observation will be far more searching and they will be supplemented by measurement, but there is much to be said for *direct* observation.

The use of the cine-camera in safety work is becoming established. There is no better way of inculcating safety ideas than by really good cinematographic demonstration. The preparation of these films, however, is pre-eminently a matter for experts; and the work cannot be better undertaken than by the Home Office. We could wish that a cinematographic survey could be made of the dangers and necessary precautions associated with every process and that the film could be shown regularly to the employees at each works wherein those processes are used. The slow-motion film, but perhaps not the ultra-slow-motion, has a wide field here.

Cardiff—A Criticism

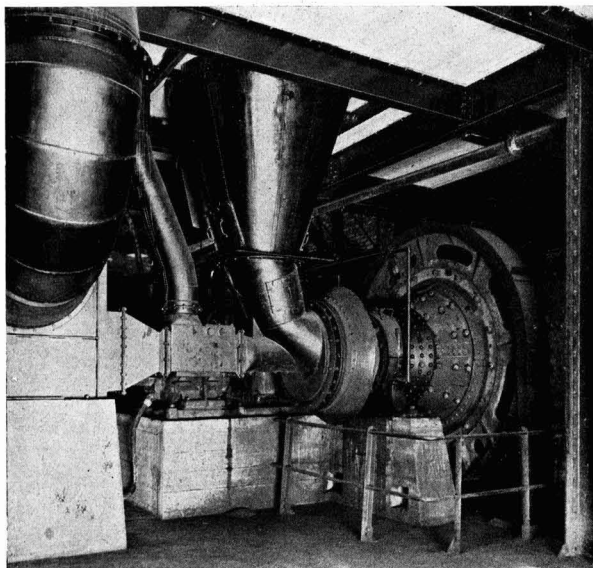
MEMBERS of the Society of Chemical Industry who contemplate taking part in the discussions at Cardiff next week have been sadly disappointed to find that no advance copies of papers are available. Everything else has been arranged to perfection, but this is an unfortunate omission which we suggest should be obviated in future. It may be that the authors, or the printers, have been primarily responsible for the absence of advance copies on this particular occasion, but the Society itself should make sure in future that those who want them may obtain them at least a week in advance.

Titanium Pigments Manufacture at Billingham



Driving Gear for the Rotary Kiln in which the Ilmenite is dried before grinding.

The Ilmenite Grinding equipment is an installation of very modern design.



THE development of the use of titanium pigments has for long been closely watched by leading British firms in the chemical and pigment trades, notably Imperial Smelting Corporation, Ltd., Imperial Chemical Industries, Ltd., and Goodlass Wall and Lead Industries, Ltd., in the realisation that Britain ought to be self-supporting as soon as the extent of the British demand justified it. These three large organisations have now united with the National Lead Company of America (which controls the oldest titanium pigment enterprises both in America and Europe) to form the British Titan Products Co., Ltd., and the new works of the latter company at Billingham-on-Tees were formally opened by Sir Robert Horne, M.P., on July 9.

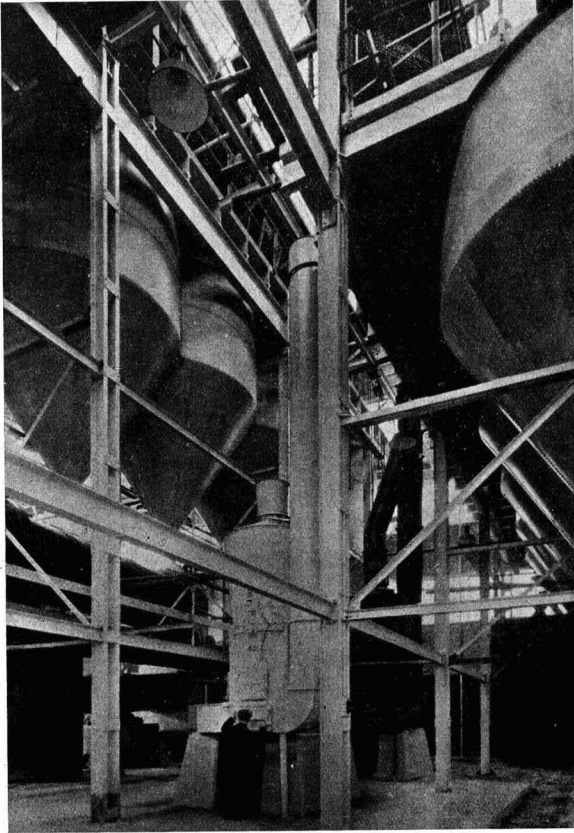
While under British control, the British Titan Products Co., Ltd., has been so constituted as to secure the active co-operation of the pioneers and leaders in the manufacture of titanium pigments both in America and in Europe. In this way, costly and troublesome initial difficulties in manufacture have been avoided, and the experience acquired through research by these manufacturers into the application of the pigments in a wide range of industries is now available to assist future development in this country.

The history of the titanium pigments industry covers a period of less than half a century, and its major advances have taken place during the last fifteen years. From the time of the discovery of titanium in 1791 until 1850, when its ores began to be smelted for their iron content in America and Norway, it found no technical utilisation whatever. Even then, the presence of the titanium introduced such difficul-

ties into the smelting process that the Norwegian mines, which had been worked by an English company from 1860 onwards, were abandoned in 1869. J. W. Ryland, of Birmingham, who had been interested in this company, attempted to salvage something from the wrecked smelting enterprise by using the pulverised titanium ore, ilmenite, as a pigment for paints for gas tanks. This was the first application of a paint material containing titanium, and this paint was found to be extremely resistant to atmospheric influences.

In America, rutile, an ore containing over 90 per cent. of titanium dioxide, was used as a pigment at about the same time, but development other than on the metallurgical side was slow until about 1908, when two quite independent groups, A. J. Rossi and L. E. Barton, in the United States, and P. Farup and G. Jebsen, in Norway, began researches designed to discover possible new uses for titanium. Realising the outstanding importance of the pigmentary properties of titanium dioxide, both groups devoted themselves to the discovery of an efficient process for obtaining this product from titaniferous ores. Two procedures were developed as a result, the American being based on fusion of the ore with nitre-cake and coke in an electric furnace, and the Norwegian on the solution of ilmenite in sulphuric acid.

The period of close co-operation between the two groups of workers since they established contact in 1920, and the resulting interchange of technical knowledge, has led to a far more rapid progress than could have been achieved by either side working alone. One result of this pooling of knowledge has been the adoption by the European company



The Pigment Storage Silos are of large dimensions and are adjacent to the Pigment Grinding Equipment.

of the American type of composite pigment containing 25 per cent. titanium oxide and 75 per cent. barium sulphate in preference to pigment mixtures previously made by them; on the other hand, the European method of extraction by solution in sulphuric acid has replaced the fusion process in America.

The general principles underlying the manufacture of titanium pigments are simple, but the details of the processing conditions are both intricate and exacting. The processes, in fact, involve applications of the very latest advances in the field of colloidal science.

After being dried and ground, the ilmenite ore is dissolved in sulphuric acid. Then follows an elaborate series of treatments having as their ultimate object the production of a very pure paste of titanium hydroxide. The conditions of preparation of this are critical and its purification is costly and lengthy. The hydroxide is calcined to form the dioxide, again under conditions which allow but the slightest variations. The furnacing treatment is followed by intensive grinding and air flotation to give the desired fineness and uniformity of particle size.

Every stage of the manufacture requires very careful and skilled technical control by a large laboratory staff, several members of which work continuously on shift work. Consequently, it is not economical to run a plant as a small unit, and this was borne in mind when deciding whether the time was ripe to commence economic manufacture in this country.

The small kiln used for the preliminary drying of the ilmenite is of Danish manufacture and was brought from the original works at Fredrikstad. This kiln was actually the first apparatus in which calcined titanium pigments were made in Europe on a commercial scale. Apart from this piece of apparatus, which is of historical interest, the whole of the plant is of British manufacture. It may be mentioned also that the staff is British with the exception of a Nor-



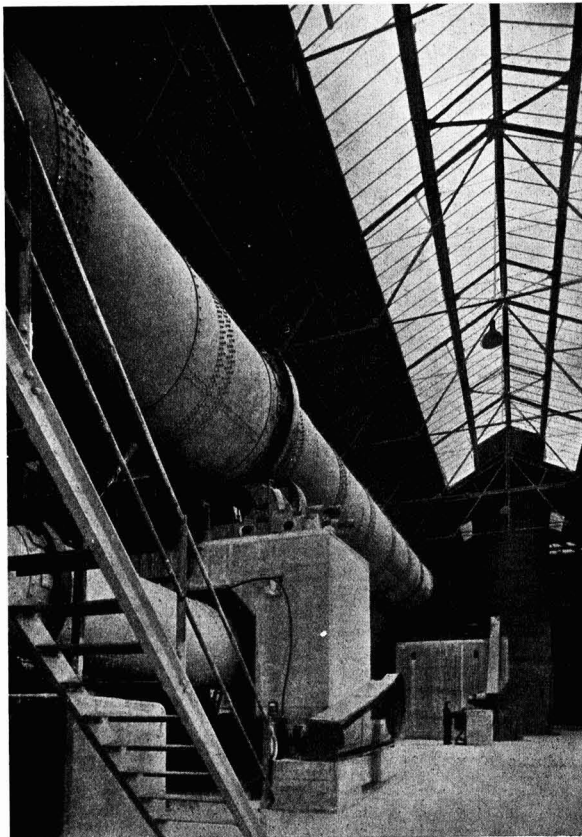
This Battery of Washing and Filtering Machines is an important feature of the new works.

wegian engineer and a Norwegian chemist, who have had long experience in the manufacture of titanium pigments and whose assistance in the maintenance of the standards of quality to which British consumers are accustomed will be invaluable.

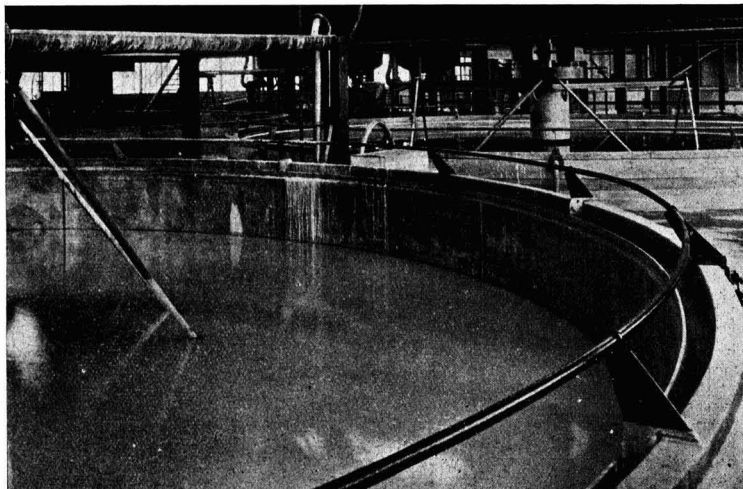
Building operations commenced on August 30, 1933, and the first cargo of ilmenite was received and put into the silo by band conveyors on April 9, 1934. Ilmenite grinding commenced on May 1, and the first full scale chemical reaction between ilmenite and sulphuric acid took place on May 18, 1934. Thus less than nine months elapsed between the time when the site was a green field to the time when it carried a large and up-to-date factory in operation.

At Billingham there are cheap supplies of electric power, steam and by-product coke oven gas; good water is plentiful and sulphuric acid is delivered to the factory by pipe-line. Large quantities of raw materials for "extenders" are mined near at hand. There is also access to a deep water wharf where incoming ilmenite can be discharged by the most modern methods.

Titanium pigments are unchanged by exposure to light or to heat, and by reason of their chemical inertness, fields of usefulness are opened up to them which are closed to other more chemically active white pigments. It is possibly due to this inertness that they are non-poisonous, a requirement of obvious importance in the many pigmented articles which come into contact with foods. Their principal outlet at the present time is in the paint and associated industries, but in many other trades their characteristics are satisfying the insistent demands for progress. They are used, for instance, in artists' colours, printing inks, inlaid linoleum, artificial leather, leather finishes and in synthetic resin plastics. In glass, ceramics, vitreous enamels, cements and artificial marbles, titanium pigments provide the means of reaching altogether new standards of finish, while the hitherto unobtainable brilliance and purity of appearance which they give to white



In this large Rotary Kiln the Titanium Hydroxide is calcined under strict temperature conditions.



General view of the thickening Tanks where a very pure paste of Titanium Hydroxide is obtained.

rubber goods of all kinds greatly increases the market for these materials.

In the higher grades of paper, cosmetics and artificial silk, titanium has also recently been used with remarkable effect and its consumption in the manufacture of these materials is likely to increase considerably. It is probable that the number of applications will be multiplied as their unique properties become more widely realised in the industrial world.

Sir ROBERT HORNE, in opening the new works on Monday, said they were inaugurating a new industry which was believed to have great prospects in the future. Its history had been a short one. It was not long since titanium pigment began to be used as the foundation for the production of paint. It had its inauguration in England, but was allowed to lapse. Experiments were made in Norway, and in America, and in the year 1918 the first commercial plant for the production of titanium pigments was erected at Fredrikstad, in Norway. In 1924 a similar plant was erected in

America and in 1931 the American and Norwegian interests came together and in combination with the I.G. Co., of Germany, put down a great plant at Leverkusen, which was now supplying the European needs for this particular product. They were not entering into competition with the pioneers of the industry. On the contrary, they were working hand in hand.

The new works were all composed of British material, with one exception, and that had rather a romantic character because it was the first kiln used at Fredrikstad. Its installation at Billingham gave hope and encouragement for the future. The factory was built in an excellent locality. They had used 1,100 tons of steel, 720,000 bricks, 10,000 tons of concrete, 40,000 sq. ft. of glazing, 60,000 sq. ft. of protected metal sheeting, and 200 tons of lead. It was intended to duplicate the plant at the first opportunity.

Mr. ROLAND JENNINGS, M.P., welcomed the new industry to give employment to the people he represented in the House of Commons.

Letters to the Editor

The Editor welcomes expressions of opinion and fact from responsible course, preferred, but where a desire for anonymity is indicated this useful ideas and suggestions have been received, signed with a non-de-plume and giving no information as to their origin. Correspondence cannot be published in THE CHEMICAL AGE unless

persons for publication in these columns. Signed letters are, of will invariably be respected. From time to time letters containing useful ideas and suggestions have been received, signed with a non-de-plume and giving no information as to their origin. Correspondence cannot be published in THE CHEMICAL AGE unless

Vitamins in Foodstuffs

SIR,—Your correspondent Mr. George A. Greenwood (THE CHEMICAL AGE, June 30, p. 565) has allowed his enthusiasm for quantitative vitamin administration somewhat to outrun that accuracy of description that one naturally expects in a journalist of such high standing. His statement that "scientists discovered the element, radiostoleum, which contains vitamins A and D in accurately measured quantities" must somewhat mystify those of your readers who recognise in the product mentioned a standardised and highly reputable product of a well-known British pharmaceutical house, that the manufacturers themselves would be the last to describe as an "element." Actually, of course, the product consists of an oil solution of a vitamin A concentrate made from natural sources, and of calciferol, the pure crystalline vitamin D, and similar products, as, for example, Adexolin, manufactured in the Glaxo laboratories, standardised along the same lines, have been on the market for a considerable time, have been used in clinical practice, and have certainly claims to the same "elementary" justice from Mr. George Greenwood as the particular preparation that he singles out for mention.

May I venture, in all friendliness, to suggest to Mr. Greenwood that, when writing to a technical paper like THE CHEMICAL AGE, he endeavour to restrict his use of technical terms like "element" to their technical meanings?—Yours faithfully,

A. L. BACHARACH.

Glaxo Laboratories,
56 Osnaburgh Street, N.W.1.

The Chemist Has Done It

SIR,—It will come as a surprise to many who read your editorial comment last week on "Atmospheric Sulphur and the Chemist" to learn that the "Big Bad Wolf"—black smoke—is not the real air pollution culprit after all. Your practical question "Is it completely certain that sulphur can do the damage if there is no tarry smoke adhering to the stonework to absorb the oxides?" however, requires an answer.

Long ago I examined a black mass found lying at the bottom of the chimney of a factory which had not been in operation for many years. The top of the mass was loose, but lower it was caked together more or less in rough layers containing a quantity of dirty crystals. As might be suspected, these crystals were ammonium sulphate, and neighbouring allotment holders were invited to use the deposit on their plots. After the factory had ceased to work, the soot

lining the inside of the chimney had become damp and fallen to the bottom, where the rain kept it moist. Chemical changes had resulted in the formation of sulphate of ammonia and the heavier downfalls of rain had dissolved the salt and carried it successively lower and lower until there was a good layer of fairly white crystals resting on the flue dirt at the bottom.

In a drizzling rain one may often see a pellicle of soot floating on the water in the roadside gutter. This is sometimes held back by some floating obstruction, such as a straw, and when the gutter becomes more or less dry the soot scum stays as a black patch. This is precisely what happens in the case of buildings. The soot scum settles in the metal troughs and gutters and in the interstices and carvings of stonework, and changes occur similar to those found in the bottom of the disused factory chimney shaft. The sulphate of ammonia decomposes and, like sulphuric acid, attacks the materials on which it rests.

If fuel were completely consumed the sulphur would pass off as SO₂. This product quickly diffuses into the unlimited and imponderable atmosphere and does little harm, as it remains innocuous until it comes into contact with water. Even then, if the air over a town is charged with the gas and there is a downfall of rain the gas is dissolved and carried down in the first few minutes and the following rains clear it off the buildings.

If one exposes a piece of grey calico to the first few drops of rain after a prolonged drought in Manchester, allows the drops to dry and then exposes them to heat (not sufficient to scorch the fabric), the rain spots become brown or black, and tender. This is due to SO₂, and it would not occur after rain had been falling for a few minutes. The sheep on the moors round Stalybridge, which ought to be white, are nearly black. The surface water is collected for industrial use. If a quantity of water is evaporated to a small bulk and spotted on to a cloth and treated as in Manchester a similar result is found, due to soot.

Your editorial note concludes with the remark that it is up to the chemist to solve the latest problem (relating to sulphur) that civilisation has put before him. My answer to this is that the chemist has done this. He has produced an open grate* from which no sulphur can pass upwards, except as SO₂, and the National Smoke Abatement Society knows this.—Yours faithfully,

W. WARR.

Moorgate, Buckton Vale, Stalybridge.

[*Our correspondent encloses literature describing a modern grate invented by him which ensures the complete burning of the fuel employed. The invention, he points out, awaits exploitation.—ED., C.A.]

Society of Chemical Industry at Cardiff

Fifty-Third Annual Meeting opens Next Monday

FINAL arrangements have been made for the fifty-third annual general meeting of the Society of Chemical Industry, which opens at Cardiff next Monday and continues until Friday evening, July 20. An attractive programme has been planned by the local South Wales Section in co-operation with the parent Society, the hon. secretary of the meeting being Dr. E. A. Rudge, of the Technical College, Cardiff, who has just been awarded the degree of Ph.D. by the University of London for a thesis on "The Decay of Timber." Latest reports from Cardiff indicate that a large attendance is expected. A number of members will fly to and from Cardiff by Western Airways Dragon Moth aeroplanes. Following is a summary of the programme:

MONDAY, JULY 16.

8 p.m.—Informal reception at the University College.

TUESDAY, JULY 17.

Technical College. 10 a.m. Council meeting. 10.45 a.m. Annual general meeting, followed by the presidential address of Dr. J. T. Dunn (Newcastle-on-Tyne), on "Science and Industry—the Fertility of Ideas."

11 a.m. (For ladies). Inspection of Grounds of St. Fagan's Castle, by permission of the Earl of Plymouth.

1 p.m. Luncheon at the banqueting hall, St. Fagan's Castle, by invitation of the chairman and committee of the South Wales Section.

2.15 p.m. Group photograph.

3 p.m. Works visits. Aberthaw Cement Works, Aberthaw; Thos. Owen & Co., Ely Paper Mills, Cardiff; Spillers' Flour Mills (1034), Cardiff Docks; Melingriffith Tin-Plate Mills, Cardiff.

7.45 for 8 p.m. Civic Reception in the City Hall, by invitation of the Lord Mayor and Lady Mayoress on behalf of the City Council.

WEDNESDAY, JULY 18.

9 a.m. Leave for Swansea. Works visits *en route*. 11 a.m. The Llandarcy Oil Refineries of the Anglo-Persian Oil

Co., Ltd.; or 11.15 a.m., the Mond Nickel Works, Clydach.

1.15 p.m. Luncheon, by invitation of the Mayor and Corporation of Swansea.

4 p.m. Circular tour of the Gower Coast.

6.30 p.m. Dinner by invitation of the South Wales Section for participants in the Swansea visit. Arrangements have also been made for an alternative short excursion.

THURSDAY, JULY 19.

10.30 a.m. Plastics Grop Session, in the Lecture Theatre, Department of Chemistry, University College. Open to all. "Plasticity the Servant of Industry," by Professor H. Freundlich.

10.30 a.m. Excursion for ladies to Llandaff Cathedral.

1 p.m. Luncheon of the Plastics Group, Connaught Rooms, Queen Street. Open to all.

2.30 p.m. The Sir William Rearden Smith Lecture Theatre, National Museum of Wales. Presentation of the Messel Memorial Medal to Sir Harry McGowan. Address by Sir Harry McGowan on "The Uneven Front of Research."

5 p.m. Technical College. Committee meeting of Chemical Engineering Group.

7 for 7.30 p.m. Annual dinner of the Society at the City Hall.

FRIDAY, JULY 20.

10 a.m. Road and Building Materials Session. Open to all. Assembly Hall, Technical College. Address by Colonel C. H. Bressey on "British Roads Development during the Last Fifteen Years."

10.30 a.m. Ladies' conducted tour of the Civic Buildings and/or Cardiff Castle.

2 p.m. Tour of the Wye Valley; or tour by the coast route to Porthcawl, via Ogmere and Southerndown.

8 to 12 p.m. Assembly Hall, Technical College. Informal dance to the accompaniment of the Chemical Society of the Technical College.

Paint Manufacturers' Conference at Turnberry

A Tribute to the Value of Press Advertising

THE annual conference of the National Federation of Associated Paint, Colour and Varnish Manufacturers of the United Kingdom has just been held at Turnberry, Scotland, with a record attendance of 140 members.

Mr. S. Romilly Hall, chairman of the Paint Marketing Council, paid a tribute to the success of Press advertising in reducing unemployment in the paint and allied trades. The Paint Marketing Council, he said, were firmly convinced that the Press were basically responsible for the success of the campaign this year to bring before the public the many uses of paint and thereby to provide more employment for the painter and paint manufacturer. People in this country had been prone to leave decorating until the spring and summer months, yet in reality the use of paint in the autumn and winter months was not only essential, but also in the interests of the general public. The sum of £50,000 was being contributed by the Paint Marketing Council for a campaign on these lines largely conducted through advertising in the Press, with the result that the unemployment figures for the first three months of the year showed a considerable improvement.

Need for Improved Products

Mr. S. K. Thornley, president of the Research Association of British Paint, Colour and Varnish Manufacturers, spoke on the attitude of the Government to research associations and the conditions under which the Government would give increased financial support in future. The industry must,

he said, be prepared to raise a larger subscription income and in the case of the paint and varnish industries it would be necessary to increase the subscriptions by about 20 per cent. He did not think it necessary to stress the advantage of improving the products of the industry, but he asked those firms who were not subscribers to consider the question from the point of view of the general welfare and efficiency of the trade.

He thought the industry would see the need there was for it to improve its products in every possible way in order to maintain its position in face of the efforts of other industries to produce decorative materials which did not require to be painted.

Additions to the Free List

Among items of general interest and importance to the trade, the recent addition of rosin and wood oil to the free list and the institution of a drawback scheme for linseed oil, as a result of applications made by the Federation, had been very beneficial to the industry, and it was expected that copal gums would be added to the free list in the near future. The Cellulose Lacquer Association reported that it had obtained a revision of the freight rates of products exported to South Africa. The Export Section stated that it was keeping a close watch on the Anglo-French commercial negotiations, the incidence of Japanese competition, and the question of Imperial preference extended to British goods imported into the Crown Colonies.

Standardisation of Insecticides and Fungicides

Revised and Extended Specifications

REVISED and extended specifications for insecticides and fungicides, prepared by the Association of British Insecticide Manufacturers, are printed in the June issue of the Journal of the Ministry of Agriculture. The standardisation of these sprays has for some years been a subject for discussion among both the users and manufacturers of these chemicals; and representations have from time to time been made to the Ministry of Agriculture by organisations of farmers or growers asking that steps should be taken to require a guarantee of the content of active materials in these products. The first step in this direction was made soon after the war, when a committee of the Chamber of Horticulture, in co-operation with the Board of Agriculture, prepared specifications for a certain number of the more important insecticides and fungicides then in use. These specifications were published in one of the Ministry's leaflets (Advisory Leaflet No. 9).

Agreed Method of Analysis

As a result of discussions between representatives of the National Farmers' Union, the insecticide and fungicide makers and the Ministry, the Association of British Insecticide Manufacturers undertook to bring up to date the specifications published in Advisory Leaflet No. 9, and to add specifications for certain compounds not previously dealt with. These latter include copper fungicides for potato-spraying, which had been specially mentioned by growers' representatives as having caused difficulty. The Association has now prepared these specifications, which have been accepted by the Government Chemist, the National Farmers' Union and the Ministry. In addition, and no less important, agreed methods of analysis have been drawn up.

"The Fruit Grower" states that members of the Association of British Insecticide Manufacturers, and certain other firms, have agreed to conform to these standards, and purchasers of the insecticides and fungicides in question are advised to require a guarantee that materials supplied shall comply with these specifications.

Details of the Specification

The detailed specifications are as follows:—

(1) *Lead Arsenate*.—The lead arsenate used in this country is the di-plumbic arsenate (Pb_2HAsO_4). The specifications given below apply to this form.

(a) *Lead Arsenate Powder*.—Lead arsenate powder shall be a fine powder free from lumps and grit. It shall contain not less than 31 per cent. of arsenic calculated as arsenic pentoxide (As_2O_5) not less than 63 per cent. of lead oxide (PbO) and not more than 0.5 per cent. of water-soluble arsenic expressed as arsenic pentoxide (As_2O_5) when tested in the prescribed manner. It shall conform to the limit test for acidity. (Note.—Some manufacturers offer powder lead arsenate containing spreaders or wetting agents. In such cases the above limits may not apply, and in these circumstances the manufacturer should declare the total contents of arsenic pentoxide and lead oxide and the maximum amount of water-soluble arsenic present.)

(b) *Lead Arsenate Paste*.—Lead arsenate paste shall be of a uniform smooth consistency, free from lumps and hard particles, and shall readily rub down to a fine cream with water. It shall consist essentially of a mixture of di-plumbic arsenate and water. The paste shall contain not less than 14 per cent. of arsenic calculated as arsenic pentoxide and not less than 28.4 per cent. of lead oxide. It shall conform to the limit test for acidity and shall not contain more than 0.5 per cent. of water-soluble arsenic expressed as arsenic pentoxide calculated on the dry basis. The manufacturer shall declare the percentage of arsenic expressed as arsenic pentoxide in the paste. Pastes are normally sold with a content of either 15 per cent. or 20 per cent. of arsenic pentoxide.

(2) *Lime-Sulphur Solution*.—Lime-sulphur solution shall be clear and free from sludge and shall have a specific gravity of approximately 1.3. It shall contain not less

than 18.5 per cent. weight in weight of polysulphide sulphur equivalent to approximately 24.0 per cent. weight in volume, as determined by the prescribed method.

(3) *Nicotine and Nicotine Sulphate*.—The manufacturer shall declare the content of nicotine in the material and that it is substantially free from coal tar bases. (Note.—Purchasers should note that while the term "Nicotine" is generally understood to mean a pure or commercially pure product of 95 to 98 per cent. strength, it is often loosely employed by some sellers to designate nicotine sulphate containing 40 per cent. of nicotine or materials containing between 40 and 95 per cent. of nicotine.)

(4) *Copper Sulphate*.—Copper sulphate shall contain not less than 98 per cent. of crystallised copper sulphate ($CuSO_4 \cdot 5H_2O$) when tested by the prescribed method.

(5) *Bordeaux Powder*.—Bordeaux powder is composed of copper sulphate and lime (calcium oxide or hydroxide). The equivalent content of copper (Cu) shall be declared. The powder shall contain no water-soluble copper.

Burgundy Powder

(6) *Burgundy Powder*.—Burgundy powder is a mixture of copper sulphate and sodium carbonate. The equivalent content of copper shall be declared. The powder shall not show more than 2 per cent. alkalinity expressed as sodium carbonate (Na_2CO_3) when tested by the prescribed method and shall contain no water-soluble copper. The whole of the powder shall pass through a 30-mesh British Standards Sieve (B.S.S. 410/1931).

(7) *Cheshunt Compound*.—Cheshunt compound consists of a mixture of two parts by weight of copper sulphate and 11 parts by weight of ammonium carbonate, as defined by the Cheshunt Research Station. It shall contain not less than the equivalent of 3.8 per cent. of copper, when tested by the prescribed method.

(8) *Soft Soaps for Spraying Purposes*.—When tested by the prescribed methods, soft soap for spraying purposes shall conform to the following requirements: (1) It shall dissolve completely in distilled water to a clear solution. (2) It shall contain not more than 1 per cent. of free caustic alkali, calculated as potassium hydroxide (KOH) and not more than 3 per cent. of free alkali carbonate, calculated as potassium carbonate (K_2CO_3). (3) Not less than 95 per cent. of the total alkali expressed as potash (K_2O) shall be potash (K_2O). (4) The percentages of fatty and of resin acids shall each be declared.

Cyanides

(9) *Cyanides*.—(a) *Sodium Cyanide*.—Sodium cyanide shall contain not less than 97 per cent. of sodium cyanide. (Note.—The strength of sodium cyanide is frequently expressed in terms of potassium cyanide. Since 100 parts of pure sodium cyanide are equivalent, as regards hydrocyanic acid content, to 132.8 parts of potassium cyanide, sodium cyanide of 97-98 per cent. strength is often spoken of as "120-130 per cent. cyanide.") (b) *Potassium Cyanide*.—Potassium cyanide shall contain not less than 93 per cent. of potassium cyanide. (c) *Calcium Cyanide*.—Calcium cyanide shall contain not less than 40 per cent. of calcium cyanide.

(10) *Formaldehyde*.—Commercial formaldehyde (sometimes called Formalin) is essentially a colourless solution of formaldehyde in water, neutral or faintly acid to litmus. It shall contain not less than 36 and not more than 40 per cent., weight in volume, of formaldehyde ($HCHO$), when tested by the prescribed method.

[A footnote is printed to lead arsenate, lime-sulphur solution, Bordeaux powder, Burgundy powder and soft soap for spraying, which reads: "There are certain factors affecting the efficiency of this product which it is not possible to define with certainty in the present state of knowledge. A specification which will afford a complete guide to efficiency cannot be prepared at present. The user is, therefore, advised in his own interests to purchase only the products of reputable British manufacturers."]

Financial Position in the Chemical Industry

By S. HOWARD WITHEY, F.C.I.

THE majority of firms engaged in the chemical, metal, and allied industries have reported better results for the past financial year, and signs of further improvement may be traced in the rises which have since taken place in stocks and book debts. In many instances, however, the restriction of export trade has resulted in the realisation of artificially small profit balances, and in the case of firms whose output is largely exported during normal times, the shrinkage of turnover is reflected in trading losses, necessitating considerable transfers from reserves or other resources for the purpose of meeting debenture interest and preference dividends. Indeed, without the aid of unrequired tax reserves, profits realised on the sale of investments, and other credit balances of a similar nature, some firms would have been quite unable to meet debenture and mortgage interest, but happily this unsatisfactory state of affairs is the exception and not the rule, and 1933-34 can be said to mark the turning point in the fortunes of public companies directly and indirectly connected with industrial and engineering chemistry.

Dyeware and Chemicals

During the twelve months ended March 31 last, the Yorkshire Dyeware and Chemical Co., Ltd., made a profit of £23,914, representing an increase of £150 in relation to the previous year's figure, enabling the directors to declare a final dividend of 7½ per cent., making 10 per cent. for the year, as before, also a bonus of 2½ per cent. A year ago, the sum of £5,000 was allocated to the reserve, bringing that fund up to £65,000, or nearly one-third of the paid-up capital, but on this occasion no special transfer was made, the final account showing a credit balance of £7,331 to be carried forward to 1934-35, as against the sum of £6,546 brought in from 1932-33. Registered in 1900, this company has an authorised capital of £200,000, all of which ranks for dividend in the form of £1 shares of one class, and its dividend record for the past seven years is as follows:—1927-28, 15 per cent.; 1928-29, 10 per cent.; 1929-30, 10 per cent.; 1930-31, 10 per cent.; 1931-32, 10 per cent., plus a cash bonus of 5 per cent. and a capitalised bonus of 3½ per cent.; 1932-33, 10 per cent.; 1933-34, 10 per cent., plus a bonus of 2½ per cent.

After providing for contingencies, and debiting the sum of £7,935 for special depreciation, and £46,289 under the heading of repairs and renewals, the British Cotton and Wool Dyers' Association, Ltd., of Manchester, realised a working profit of £116,030 during the financial year to the end of March last. This figure compares with £110,075 shown in the previous account, and after charging interest on the 4 per cent. first mortgage debenture stock, and making the usual transfer of £25,000 to the depreciation fund, and £5,000 to the employees' fund, the balance of net profit worked out at £59,945, or a decline of £2,835 in relation to the amount realised in 1932-33. The dividend of 5 per cent. was repeated, and the sum of £10,000 was placed to an obsolescence fund, the carry forward being then £46,956, or an increase of £9,137. The fixed assets were valued for balance sheet purposes at £1,425,405, while the reserve funds amounted to £275,000, apart from a depreciation fund of £182,336.

Bleachers' Association

The curtailment of shipments to the Far East and other overseas markets was reflected in the audited accounts submitted by Bleachers' Association, Ltd., covering the twelve months' operations to March 31 last. At £370,092, the gross trading profit registered a substantial reduction in relation to the figure of £536,419 shown in the 1932-33 tabulation, and after debiting outlay on repairs and maintenance, and making provision for depreciation, etc., the net profit balance proved to be only £2,425, which compares very unfavourably with £107,173 realised during the preceding twelve months. Only a quarter's dividend was paid on the preference shares, thereby reducing the carry forward from £183,360 to £151,582. Loans and creditors were shown on the balance sheet at £454,804, while current assets totalled £655,519, and the

fixed assets £7,976,970. This Association also exercises a direct controlling interest over numerous companies, the authorised capital being £8,000,000, of which a total of £6,306,237 has been issued and paid up consisting of £2,487,500 in the form of 5½ per cent. cumulative preference stock—the £1 units of which were recently quoted at 11s. 6d., and the balance in ordinary stock, marked at 8s. per £1 unit.

Dyeing and Cleaning

A further loss was reported by Associated Dyers and Cleaners, Ltd., necessitating a transfer of £65,539 from the general reserve in order to extinguish the deficit. A loss of £3,690 was sustained on the sale of a branch business, and this was debited to the reserve, which now amounts to £46,287. This unsatisfactory state of affairs was due, in large measure, to excessive processing costs arising from the continued employment of obsolete machinery, and to a lack of effective demand, and the appointment of a committee of investigation was proposed. Registered privately in 1908, the company was converted into a public undertaking in 1926, and owns the entire capital of several companies, including J. Pullar and Sons, Ltd., and Swift and Presswell, Ltd. It is anticipated that the capital will be reduced, but to what extent it is not yet possible to decide. The trading results for the first six months of 1934 show an improvement in relation to the figures for the first half of 1933. The Continental Tintex and Dye Products Co., Ltd., also sustained a loss, which has the effect of increasing the debit balance to £42,802, and it was proposed to carry through a capital re-organisation scheme under which the capital will be reduced from £200,000 to £20,000 by the cancellation of 4s. 6d. on each 5s. share.

During 1933 a net loss of £11,884 was sustained by Fricker's Metal and Chemical Co., Ltd., thereby converting a credit balance into a debit of £10,692. The company was registered in May, 1932, for the purpose of acquiring the undertaking and the assets of Fricker's Metal Co., Ltd., and specialises in the manufacture of zinc oxide. The authorised capital is £300,000, of which a total of £192,250 has been issued, composed of preference and ordinary shares, of which £167,250 has been called up, *viz.* £29,500 in the form of 8 per cent. cumulative preference £1 shares—the dividend on which is in arrear as from May, 1932; £112,750 in ordinary fully paid shares of £1; and £25,000 in ordinary shares with 10s. paid.

Pharmaceuticals and Fine Chemicals

After debiting working expenses and income tax, the final figures submitted by Boots Pure Drug Co., Ltd., covering the twelve months' operations to March 31, disclosed a trading profit of £943,075, which compares favourably with the profit of £832,158 made in 1932-33. The net profit balance proved to be £744,866, representing an increase of £43,413, or approximately 6½ per cent., consequently the rate of ordinary dividend was maintained at 20 per cent., of which 5 per cent. is tax free, and the sum of £150,000 was placed to the general reserve, which now shows a credit balance of £1,650,000. The freehold property reserve was increased by £16,018, and the employees' pension fund to £402,722, but at £103,712 the works development fund shows a reduction. The entire authorised capital of £2,900,000 ranks for dividend, consisting of seven issues of preference and preferred shares totalling £1,400,000, and £1,500,000 in the form of ordinary 5s. shares which were recently quoted at 43s. 6d.

Despite the losses due to the explosion at the Mitcham factory, a further recovery was reported by W. J. Bush and Co., Ltd., the net profit of £70,391 representing an increase of £11,421 in relation to the previous year's figure. The dividend on the £250,000 of ordinary £1 shares was therefore raised from 9 per cent. to 11 per cent., absorbing £27,500, and after adding £25,000 to the reserve, and reducing the book value of the goodwill by £22,000, the carry forward amounted to £91,928. The balance sheet showed goodwill at £80,000, and the general reserve at £225,000, while at

£19,807 the exchange reserve registered an increase of £1,000. The entire authorised capital of £375,000 has been issued and fully paid, and consists of £125,000 in 5 per cent. cumulative preference £5 shares—the dividend on which takes £6,250; and £250,000 in ordinary shares. The preference shares were recently marked at par.

British Alkaloids, Ltd., made a profit of £10,174 during the financial year to March last, thereby enabling a dividend of 2½ per cent. to be paid on the ordinary shares. For 1932-33, the profit worked out at £5,464, and only the fixed dividend on the 8 per cent. non-cumulative participating preference shares was met. As before, £300 was written off the preliminary expenses account, while the taxation reserve received an allocation of £2,250. After writing off £4,850 for advertising, the carry forward was slightly higher at £739. An increase of profit was also reported by the directors of Dubarry Perfumery Co., Ltd., the net figure being £25,064 which compares with £19,549 in 1932, and the declaration of a final dividend of 30 per cent. on the ordinary shares made a total of 35 per cent. for the year, or an increase of 15 per cent. The sum of £3,597 was allocated to the taxation account, and £209 as staff bonus, leaving a credit of £6,095 to be carried forward, as against £3,587 brought in.

In the soap section, satisfactory figures have been sub-

mitted by some of the principal companies, and in the case of Gerard Bros., Ltd., of New Basford, Nottingham, the profit for the 1933-34 financial year amounted to £8,952, which compares very satisfactorily with the profit of £5,642 shown in the preceding audited account. The dividend on the ordinary shares was maintained at the rate of 12½ per cent., and another £2,000 was transferred to the reserve, bringing that fund up to £40,000, while the employees' benefit fund received £500. During the same period, J. C. and J. Field, Ltd., realised a profit of £19,919, representing an increase of £184 in relation to the 1932-33 net figure, enabling the dividend of 10 per cent. and the bonus of 2½ per cent. to be repeated, and while no special transfer was made to the reserve, the book value of the company's goodwill was reduced by £6,553, leaving a credit of £9,389 to go forward.

The report of British Glues and Chemicals, Ltd., disclosed a net profit of £45,726 for the twelve months to the end of April last, this being slightly more than the balance realised in 1932-33. The sum of £5,000 was transferred from the income tax reserve, and although no dividend is being paid on the ordinary shares, the carry forward has been raised from £35,039 to £43,746, suggesting that if business improves during the current year the arrears of preference dividend may be caught up.

Industrial Solvents

New British Standard Specifications

FOUR further British standard specifications have just been issued in connection with the comprehensive series of nationally agreed standards for solvents. These specifications are for diacetone alcohol (No. 549), normal butyl acetate (No. 551), amyl acetate (No. 552) and ethyl acetate (No. 553) and have been prepared by the special Solvents Committee of the Chemical Division of the British Standards Institution, which Committee has been actively working for the past eighteen months under the chairmanship of Dr. J. Vargas Eyre, of the Distillers Co., Ltd.

Methods of Test

Limits are laid down in the specifications for specific gravity, distillation, acidity, alkalinity, etc., whilst standard methods of test for determining these properties are included in appendices. The details of the tests adopted have been arrived at after careful examination of existing methods of analysis, particularly from the standpoint of accuracy and reliability and in many cases experimental work has been carried out by members of the committee in practical verification of the methods. The limits specified have been fixed by agreement between the principal users and manufacturers.

Diacetone alcohol shall be clear, colourless to pale straw and free from matter in suspension, and shall consist essentially of 4-hydroxy-4-methyl-pentanone-2. The specific gravity of the material at 15.5° C. shall be not lower than 0.937 nor higher than 0.943 and at 20° C. shall not be lower than 0.935 nor higher than 0.941. On distillation, in the manner described, it shall yield not more than 5 per cent. below 160° C. and not less than 92 per cent. between 160° and 170° C. at 760 mm. pressure. The flash point (Abel's Close Test) shall be not lower than 104° F. In addition the material shall show no turbidity when mixed with distilled water in any proportion at 15° C.; it shall not show any trace of opalescence when mixed at 15° C. with any volume of petroleum ether (boiling between 60° and 80° C.). The amount of free acid calculated as acetic acid, CH₃COOH, shall not exceed 0.025 per cent.

Butyl Acetate

Butyl acetate shall be clear, colourless and free from matter in suspension and shall consist essentially of the acetic ester of primary normal butyl alcohol. The specific gravity of the material at 15.5° C. shall be not lower than 0.883 nor higher than 0.886 and at 20° C. shall be not lower than 0.879 nor higher than 0.882. On distillation it shall yield not less

than 95 per cent. between 124° and 128° C. at 760 mm. pressure. The material shall not leave more than 0.01 per cent. by weight of non-volatile residue when tested in the manner described. The acidity shall not exceed 0.01 per cent. when calculated as acetic acid, CH₃COOH. It shall show an ester content of not less than 97 per cent. calculated as butyl acetate.

Amyl acetate shall be clear, colourless and free from matter in suspension, and shall consist essentially of the acetic esters of alcohols obtained from fusel oil. The specific gravity of the material at 15.5° C. shall not be lower than 0.872 nor higher than 0.880 and at 20° C. shall not be lower than 0.863 nor higher than 0.876. On distillation, in the manner describe, it shall yield not less than 95 per cent. between 120° C. and 145° C. and not less than 33 per cent. above 135° C. at 760 mm. pressure. The material shall not leave more than 0.01 per cent. by weight of non-volatile residue. It shall not show any trace of opalescence when one volume is mixed at 15° C. with 10 volumes of carbon disulphide. The acidity shall not exceed 0.01 per cent. calculated as acetic acid, CH₃COOH. The material shall show an ester content of not less than 95 per cent. calculated as amyl acetate.

Ethyl Acetate

Ethyl acetate shall be clear, colourless and free from any matter in suspension and shall consist essentially of the acetic ester of ethyl alcohol. The specific gravity of the material at 15.5° C. shall be not lower than 0.906 nor higher than 0.909 and at 20° C. shall be not lower than 0.901 nor higher than 0.904. On distillation, in the manner described, it shall yield not less than 95 per cent. between 74° and 79° C. at 760 mm. pressure. The material shall not leave more than 0.01 per cent. by weight of non-volatile residue. It shall not show any trace of opalescence when one volume of the material is mixed at 15° C. with 10 volumes of carbon disulphide. The acidity shall not exceed 0.01 per cent. calculated as acetic acid, CH₃COOH. The material shall show an ester content of not less than 96 per cent. calculated as ethyl acetate.

Copies of the new specifications can be obtained from the British Standards Institution, Publications Department, 28 Victoria Street, London, S.W.1, price 2s. 2d. each post free. Further specifications are nearing completion in this group for acetic acids, technical ether, trichloroethylene, hexachloroethane, dibutyl phthalate, diethyl phthalate and carbon tetrachloride.

The Emission of Fumes from Chemical Works

Annual Report of the Chief Inspector of Alkali, etc., Works

THE seventieth annual report by the Chief Inspector of Alkali, etc., Works (H.M. Stationery Office, price 9d. net), states that the modern tendency is towards centralisation, the smaller works being absorbed by the larger undertakings, and, moreover, the introduction of electrolytic decomposition of brine has caused manufacturers to seek the brine areas with electric power rather than to transport salt to the coal-fields. Thus, Newcastle, which, in past years, was one of the great centres of chemical industry, has lost some of its prominence. Fifty years ago there were 21 saltcake and wet copper processes in operation on Tyneside. There is now but one wet copper process, the last saltcake plant having been closed at the beginning of 1932. In 1908 there were 37 chemical works on the Tyne registered under the Act and many of these were of considerable importance; now there are only 19.

Reduction in Number of Works

The total number of works registered in 1933 was 901 which involved the operation of 1,716 separate processes. There was a reduction since last year of 20 in the number of works and of four in the number of processes. These reductions are the smallest that have been shown since 1929. There has again been a substantial reduction in the number of sulphate of ammonia processes offset to some extent by an increase in the number of benzene processes. The number of visits by district inspectors during the course of the year was 3,996 and, in connection with these visits of inspection, 1,881 quantitative analyses were made of chimney and other gases escaping to atmosphere from the processes in operation. Every registered works has been visited at least once during the year.

Several cases have occurred in which the provisions of the Alkali, etc., Works Regulation Act, 1906, and the Alkali, etc., Works Order, 1928, have been infringed. Especially was this so in the case of sulphuric acid works, to which further reference is made later. In these cases and with all classes of works satisfactory conditions were speedily restored and it was not deemed necessary to institute any legal proceedings. It is desirable, however, to draw especial attention to the necessity of adequate chemical control of plant. In the majority of works this condition is satisfied but in others it is by no means so. Not only is the escape of noxious gases contrary to law and offensive to the neighbourhood but often it is indicative of inefficiency and waste which might be prevented by a more systematic control of the process in question. Stress must also be laid on the importance of efficient technical guidance in all undertakings, not merely to maintain plants at the maximum efficiency, but also to keep in touch with modern developments and trends of thought, such as the discovery of new applications for their products and the assistance of customers.

Coke Oven Problems

The matter of "green gas" discharge from coke ovens continues to receive attention. A new battery of ovens has recently been put into commission at Manvers Main, and it is thought that when the operatives become more used to handling the new machinery the installation will be almost smokeless. A similar battery is in course of erection at Grassmoor Colliery and several others are contemplated. The Gas Light and Coke Co.'s installation at Beckton is the only one provided with a double collecting main. In the case of modern ovens some improvement results from the use of equipment which reduces the time of charging, but this is counterbalanced by more rapid carbonisation and, consequently, more frequent charging. Steam jets fitted in the ascension pipes in order to increase the draught on the ovens during the charging operation certainly effect some improvement, but, on the whole, there seems little hope of any substantial reduction of this nuisance until coke oven owners are prepared to face a more considerable capital outlay. The additional gas and by-products that would be recovered would

probably make a reasonable return on the expenditure involved.

A complaint was made relating to smoke from the burning of limestone. Although it is known that this operation can be and is being conducted without offence, yet, after investigation of this particular case, it was thought that, so long as the existing plant and methods were continued, nothing could be done. The only remedy appeared to lie in a radical change of practice and of fuel, which was not considered to be practicable.

A complaint of fumes has arisen in connection with a works where electrically insulated paper and silk is manufactured. A fume collecting system was in use but it did not function efficiently, with the result that there was low level escape of fumes which was thought to be responsible for the complaints. The system, however, is being gradually improved and conditions are said already to be much better.

The advice of the Department was sought regarding an obnoxious escape of fumes from a works in which lead-tin alloys are made. The complaints appeared to be due to fumes containing ammonium chloride and emitted during the de-zincing of hot alloys. Remedial measures were discussed with the manager, who gave the matter careful attention. Attention was also drawn to the escape of acid fumes from galvanising works, the escape being found to be from a vat in which zinc was dissolved in weak sulphuric acid. Suggestions were offered and an addition to the plant has now been made which, it is hoped, will obviate any further cause for complaint.

Dust from Artificial Silk Works

An unusual complaint was received alleging the emission of dust from an artificial silk works. The dust was said to be highly deleterious to vegetation in some neighbouring allotments. The works employ the cellulose acetate method and it was at once suspected that the dust consisted of finely divided sodium acetate, which was emitted, together with steam, from the driers used to reduce the moisture content of this salt. Further investigation left little doubt that some, at all events, of the trouble was due to this cause. The company have now taken certain steps, which, however, can only be regarded as temporary palliative means.

With regard to the viscose artificial silk process, the method of treatment of the vitiated air by means of chlorine gas, to which Dr. Wylam called attention in the 66th Scottish Report, has been tried at three English works. Although the method evidently is giving complete satisfaction at the Scottish works, opinion in England is divided and not so favourable. At two of the works it is reported that, although the intensity of the smell is reduced, it still remains sufficiently noticeable to be objectionable. The proportion of chlorine used has been varied but with no more marked success. At a third works, the chlorine treatment has, according to the company, been a great disappointment as not the slightest difference in smell could be detected. At this latter works, strenuous endeavours are being made to reduce the offensive nature of the emission and a number of possible methods are being thoroughly investigated.

Alkali and Copper (Wet Process) Works

The tonnage of salt decomposed at alkali and copper (wet process) works in 1933 was 56,473 tons in the saltcake process, and 5,092 tons in the wet copper process. These figures show an increase since last year of 2,825 tons in the saltcake process and a decrease of 1,047 tons in the wet copper process. The average acidity of escapes has been satisfactorily low, but low level leakages have been the cause of complaint (see below). In two cases only have chimney escapes in excess of the statutory limit been detected. Both cases were due to an insufficiency of water in the absorbing apparatus; in addition, the draught was poor in the latter case. Alterations to the flues have now been made in order to secure

better draught and an extension of the condenser system is promised. A complaint directed against a saltcake works was thought to be due to ammonium chloride fumes caused by low level escapes from the saltcake plant and an adjacent ammonia plant.

A number of acidity tests have been made on a plant used for sintering roast pyrites. No complaint has been made although the plant has been in almost continuous use and the acidity of the chimney gases reaches the equivalent of about 5 grains of sulphuric anhydride per cu. ft. for a short time at the commencement of each batch. The average of all tests at smelting works showed a concentration of 2.25 grains (as sulphuric anhydride) per cu. ft. The acidity of chimney gases from this class of works remains high and is liable to cause complaint. Mere dilution of the gases is by no means an ideal solution of the difficulty but, except in the case of zinc works, where the sulphur concentration is sufficiently high to make recovery as sulphuric acid a practicable proposition, there remains as yet only the alternative of removal by absorption in alkali, which is somewhat expensive.

Mond Nickel Works, Clydach

The installation of new calciners at the Mond Nickel Co.'s works at Clydach has resulted in a notable diminution of low level escape of sulphurous gases but unfortunately the chimney gases, being less diluted with air, now possess a higher acidity than formerly. Also owing to the position of the new calciners they are discharged mainly from two chimneys instead of three as previously. Great complaint, attributed to this cause, has been made of injury to health and property. As a palliative the company is diluting the gases with air and heating them by a fire placed at the base of the chimney, but it is hoped that some better means than this will soon be devised.

The production of sulphuric acid in England and Wales during 1933 was 648,461 tons, calculated as monohydrate. This is an increase of about 10,000 tons compared with the production in 1932. An increased number of cases is reported where escapes in excess of the statutory limit have been detected. The statutory limit of four grains of sulphuric anhydride per cu. ft. is an ultra-generous one, and cases of excessive escapes should be rare. In the majority of the cases the disorganisations of plant were due to lack of supervision or to inadequate control. That this is so is evidenced by the rapidity with which normal conditions were restored after the inspector's visit.

Concentration plants have been maintained in good order and escapes have been well below the statutory limit. The average of all tests taken showed a total acidity (as sulphuric anhydride) of 0.53 grain per cu. ft. In two cases only has intervention by the inspector been necessary. One was at a works, where, owing to necessary alterations in the draughting arrangements, some difficulty was experienced in regard to low level escapes. In the other case which was similar in cause and effect, the inspector found a most lamentable state of affairs and asked for immediate investigation to be undertaken. This was done and it was found that one-half of the condenser was blocked and that the underground flue to the chimney had fallen in.

A New Cascade Plant

A new cascade plant built by a Yorkshire firm deserves especial mention. The plant is oil-fired and is liberally provided with recorders and other controlling devices. Fumes are condensed in a Calder-Fox scrubber. There is no fume whatever on the plant itself and the exits are low.

The method employed by Imperial Chemical Industries, Ltd., at Billingham, for treating the gases escaping from their oleum plant (described in the 60th Report) is being extended somewhat to ensure greater continuity of the process. The scrubbing of exit gases with sodium carbonate solution to yield sodium bisulphite continues to give satisfaction. In one case, at least, the demand for the product has so exceeded the supply that it has been found necessary to supplement the source of sulphur dioxide. There are, however, oleum plants, where no scrubbing by alkali is practised and where, consequently, escapes are much higher than in other plants.

At all chemical manure works the average of tests made showed an acidity (as sulphuric anhydride) of 0.06 grain per

cu. ft., which is the same as the previous year's average. The Broadfield dens continue to give satisfaction and to produce a good quality superphosphate. Fison, Packard and Prentice have installed two Oberphos units at their new works at Ipswich. This process is conducted under pressure and is new to this country, but the experience of Canadian and United States manufacturers has satisfied the owners of its merits. The precise method of treatment of the waste gases discharged from the pressure vessel is still under consideration.

Nitric Acid Works

The greater bulk of nitric acid produced in this country is made by the ammonia oxidation process. This process has been conducted in a reasonably satisfactory manner, although the final escapes seem to be rather higher than is desirable. At a small plant in which nitric acid is produced from nitrate of soda and sulphuric acid, there was one occasion when the inspector had to complain of negligence on the part of workmen in allowing leakage from the still cover joint. The matter was promptly rectified and may seem trivial, but attention is called to it here because the insidious danger of nitrogen oxides is not yet fully appreciated. One works was found to be operating a "nitric acid" process without registration; the company pleaded ignorance of the Act and paid the appropriate arrears of stamp duty.

There has been a further decrease of 34 in the number of works registered for the manufacture of sulphate of ammonia, and there are still a number which although registered, do not operate their plants. Now that the selling price of sulphate of ammonia has risen to £7 per ton, the larger gas companies should show a profit even with the most rigorous accountancy, while in the case of the smaller works a truly comprehensive survey would often show that the manufacture of sulphate or concentrated liquor is a more economical way of disposing of ammoniacal liquors than the wasteful methods so much in vogue. The outlook is rather more promising than it has been for some time. The case for concentration followed by working up at central works has gained ground particularly in the south, where quite a number of concentration plants have been erected or are in course of erection. A more general adoption of this course is hindered on account of the capital outlay required, and the fear of possible financial loss.

Production of Chlorine Gas

The production of chlorine gas and its subsequent liquefaction has in no case given any ground for complaint. The use of chlorine for various purposes is expanding and users are always advised by the suppliers of due precautions which ought to be taken. The Bachmann bleaching powder plant at the Staveley Coal and Iron Co.'s works has been in operation throughout the year and is an unqualified success.

Reference was made in the 60th Report to a works against which complaint had been made. These complaints continued in 1933 and further investigation was undertaken which indicated that small escapes of chlorine were still occurring and that these were probably responsible for the complaints. The enlarged condensation plant was highly efficient as regards removal of hydrogen chloride, but it did not seem to be capable of complete absorption of chlorine. Consequently special chlorine traps have now been installed.

At muriatic acid works the average of all tests made showed an escape of 0.05 grain HCl per cu. ft. In no case was the statutory limit exceeded.

The selenium light-sensitive cell detector for hydrogen sulphide in use at the British Dyestuffs Corporation's works at Blackley has been further improved and is found to answer its purpose very well indeed.

It has been necessary occasionally to draw attention to the condition of oxide purifiers used for absorption of excess hydrogen sulphide. At a dye works where sulphur black is manufactured, the inspector found foul gas containing hydrogen sulphide passing direct to the atmosphere. The matter was taken up with the management, who have now provided measures to prevent a recurrence of such an infraction of the Act. Another dye works has abandoned the system of burning hydrogen sulphide produced in their colour plant and has installed in its stead a pump and two caustic soda absorbers. The old system has been in use for ten years without

accident but the new method is better and is, moreover, profitable as the resultant sulphide solution can be utilised in the process.

At two Venetian red works in the Midlands, scrap-iron towers are used to absorb the gases from coppers roasting. The efficiencies of removal have been 82 per cent. and 81 per cent. respectively. At another works magnesite has been used partly to replace limestone in the scrubber tower; here the results, so far, are promising.

The condensation of arsenious acid arising from the calcination of tin ores has been satisfactory; the average of tests made having shown 0.029 grain of arsenious acid per cu. ft. Settling chambers and flues have been maintained in good condition.

Carbon Disulphide Works

Research work, which was initiated by Imperial Chemical Industries, Ltd., has shown that there is considerable risk of ignition of even very small concentrations of carbon disulphide in air at comparatively low temperatures. Experience gained since the fatal explosion in a Claus kiln will be usefully employed in the construction of a new plant, which is now in course of erection.

Several new registrations have been effected in respect of the removal and recovery of carbon disulphide from benzol. The necessity for removal of this constituent often arises where the strong acid wash has been omitted. There are several methods in use, some of them being of a secret nature. It is not always considered profitable to recover the carbon disulphide, which is extracted from the benzol, especially as it usually is in an impure form. The gases evolved during

the process are hydrogen sulphide together with other malodorous sulphur compounds and standard methods for dealing with them have not yet been formulated. In the meantime, however, no very great difficulty has been experienced in rendering the process inoffensive. It is anticipated that there will be considerable extension of the practice of removing carbon disulphide by one or other of the methods now on trial.

The increasing price of zinc caused more retorts to be put into operation and although the price has receded somewhat, it is likely that the increased production will continue. Manufacture of zinc oxide is increasing; a number of works having installed plant for its production by the combustion of pure electrolytic zinc.

Thirty-five new benzene works have been registered in the past year and many more are in course of erection. The plants are proving a very satisfactory asset and although, in some quarters, doubts are expressed of their value as profitable accessories to gasworks plant and of the effect of the removal of benzene on meters and appliances on the distribution side of the works, there appears to be little real cause for anxiety and a substantial increase can be expected as individual experiences become more widely known.

Greater attention has been paid to the condensation and trapping of fumes containing pyridine. This has resulted not only in improved conditions but in measurable economy.

Two new bromine works have been registered; one of them having worked without registration for a number of years. In all cases the use of bromine has been effected with suitable caution and absorption of hydrobromic acid has been accomplished in a satisfactory manner.

New Technical Books

ORGANIC SYNTHESIS. Vol. xiv. pp. 100. Chapman and Hall, Ltd. 10s. 6d.

This volume of satisfactory methods for the preparation of organic chemicals has been produced under the direction of Mr. W. W. Harkman as editor-in-chief. It deals with twenty-six preparations, and is provided with a very full subject index which includes reference to the last four volumes.

GUIDE TO THE REFRIGERATION EXHIBITION AT THE SCIENCE MUSEUM. By T. C. Crawhall, M.Sc., and B. Lentaigne, B.A. Science Museum Handbook published by His Majesty's Stationery Office, price 6d.

The title of this handbook gives only a slight indication of its contents. It seems to imply that the book may be used with advantage only when visiting the Refrigeration Exhibition at the Science Museum, South Kensington, whereas this is far from being the case. The exhibition, which is open to the public free of charge until the end of August, consists of models, small-scale working plants, charts and diagrams, designed to illustrate the principles of refrigeration, results of research, and the industrial applications of this branch of science and engineering. The authors have taken the opportunity of giving short treatises on each of the principles concerned, and subsequently described each exhibit in detail; the book is in effect a text-book in miniature. Moreover, the exhibition represents the most up-to-date practice and, in consequence, the book contains accounts of refrigerating machines and appliances which will not be found in the most modern text-book. One of the outstanding examples of this is the device known as a cold multiplier, which makes use of solid carbon dioxide in a machine operating on the absorption cycle. Apart from food preservation, refrigerating machinery is now very widely used in industry, e.g., brewing, margarine manufacture, the de-waxing of oil, and the sinking of mine shafts, in addition to the better-known applications to ice manufacture, ice-cream manufacture, etc. These and other applications are carefully described. Unnecessary details have been eliminated, leaving only the essential features in a manner which cannot fail to interest. The book is recommended to students of the subject, for whom it will form a useful introduction, and to all those whose affairs bring them in contact with the problems of refrigeration.

CONDUCTOMETRIC ANALYSIS: PRINCIPLES, TECHNIQUE, APPLICATIONS. By Hubert T. S. Britton, D.Sc., F.I.C. pp. 178. Chapman and Hall, Ltd. 12s. 6d.

In recent years much attention has been devoted to electro-metric methods, particularly those involved in the measurement of *pH*. Judging from the growing interest in conductometric titrations, as exemplified by the increasing literature dealing with their application to chemical analysis, research and to the control of certain industrial processes, and the numerous attempts that have been made to simplify the experimental technique, it was felt that a very real need had arisen for a book on the subject written in the English language. In fulfilling this need the author has endeavoured to lay special emphasis on the principles underlying conductivity determinations and conductometric titrations.

UNCLE JOE'S NONSENSE FOR YOUNG AND OLD CHILDREN. By J. W. Mellor. pp. 231. Longmans, Green and Co., Ltd. 12s. 6d.

It is not often that THE CHEMICAL AGE gives notice to a book which is distinctly non-technical in nature. The present occasion is exceptional on account of the fact that the author is well known to most chemists, and particularly to ceramists. As students, some of us became familiar with Dr. Mellor through the medium of his "Modern Inorganic Chemistry"; in industry we have had occasion to consult his "Comprehensive Treatise on Inorganic and Theoretical Chemistry," which now extends to thirteen volumes, with succeeding volumes in preparation. For a period of thirty years Dr. Mellor has been intimately associated with the Ceramic Society, rendering invaluable services as secretary, and it is on the occasion of his relinquishing these duties in an active sense that the volume under review has been published. The book gives us rather more than a glimpse of the lighter side of Dr. Mellor's nature, and, as its title indicates, it is a medley of fun and philosophy which covers a wide range of subjects. He (Dr. Mellor) calls them "random ravings," and he thanks the Ceramic Society for arranging publication "as a memento of some trifling service which the members say I have rendered, and which they are good enough, and biased enough, to appreciate far too highly." The book is embellished with 129 drawings by the author.

Institute of Metals

Annual Autumn Meeting at Manchester

THE twenty-sixth annual autumn meeting of the Institute of Metals will be held in Manchester, September 3-6, under the chairmanship of Dr. Harold Moore, president of the Institute. The proceedings will begin on Monday, September 3, at 7.30 p.m., when Dr. J. L. Haughton will deliver the thirteenth autumn lecture on "The Work of Walter Rosenhain." This lecture will be given in the Great Hall at the College of Technology.

On Tuesday, September 4, the assembled members—who are expected to number about 300—will be given a civic welcome by the Lord Mayor of Manchester, before beginning the discussion of a series of scientific papers relating to various phases of metallurgical work. Following an official luncheon at the Midland Hotel, parties will be formed to visit the works of the Broughton Copper Co., Ltd., Metropolitan-Vickers Electrical Co., Ltd., W. T. Gloyer and Co., Ltd., Mather and Platt, Ltd., or the British Cotton Industry Research Laboratory. In the evening a theatre party will be arranged.

University Reception

The morning of Wednesday, September 5, will be devoted to the discussion of further papers, the afternoon to works visits (The British Copper Refiners, Ltd., and British Insulated Cables, Ltd., Prescott, Callender's Cable and Construction Co., Ltd., Leigh, or The Chloride Electrical Storage Co., Ltd.), and the evening to a reception by the University of Manchester.

On Thursday, September 6, there will be an all-day excursion by motor coach through the dales of Derbyshire and North Staffordshire. Papers to be presented for discussion will include:—

"The Corrosion of Tin and Its Alloys. Part I.—The Tin-Rich Tin-Antimony-Copper Alloys," by T. P. Hoar, M.A., Ph.D.; "Some (Magnetic) Properties of Heavily Cold-Worked Nickel," by H. Quinney, M.A.; "The Influence of Pickling on the Fatigue-Strength of Duralumin," by H. Sutton, M.Sc., and W. J. Taylor; "A Reflectivity Method for Measuring the Tarnishing of Highly-Polished Metals," by L. Kenworthy, M.Sc., A.R.C.S., and J. M. Waldram, B.Sc., A.C.G.I.; "Experiments in Wire-Drawing. Part IV.—Annealing of H.-C. Copper Wires of Varying Hardness—Elongation Values," by W. E. Alkins, M.Sc., and W. Cartwright, O.B.E., M.Sc.; "Crystal Orientation on Heating Drawn Copper Wires," by G. S. Farnham, B.A., M.Sc., and Hugh O'Neill, M.Met., D.Sc.

A Wide Range of Subjects

Other papers will be: "The Crystal Densities of Industrial Brasses from X-Ray Data," by Professor E. A. Owen, M.A., D.Sc., and Llewelyn Pickup, M.Sc., Ph.D.; "The Improvement of White Bearing Metals for Severe Service: Some General Considerations," by D. J. MacNaughton; "The Behaviour of White Bearing Metals when Subjected to Various Deformation Tests. Part I.—Indentation Tests," by A. S. Kenneford, M.Sc., and Hugh O'Neill, D.Sc., M.Met.; "The Behaviour of White Bearing Metals when Subjected to Various Deformation Tests. Part II.—Tensile Tests," by R. Arrowsmith, B.Met., M.Sc.; "The Behaviour of White Bearing Metals when Subjected to Various Deformation Tests. Part III.—Pounding Tests," by H. Greenwood, M.Sc.; "Some Properties of Tin Containing Small Amounts of Silver, Iron, Nickel or Copper," by Professor D. Hanson, D.Sc., E. J. Sandford, B.Sc., and H. Stevens, M.Sc.; "Elongation Values of Copper and Copper-Rich Alloys," Maurice Cook, M.Sc., Ph.D., and Eustace C. Larke; "Deformation Lines in Alpha Brass," by Carl H. Samans, Ch.E., M.S.; "The Spectrographic Detection and Estimation of Minute Quantities of Impurities in Copper," by M. Milbourn, B.Sc.; "The Spectrographic Analysis of Some Alloys of Aluminium," by Ernest H. S. van Someren, B.Sc.; "A Synthetic Spectrum Method of Analysis and Its Applications to the Quantitative Estimation of Small Quantities of Bismuth in Copper," by D. M. Smith, A.R.C.S., B.Sc.

United States Helium Supplies

Operating Cost at Amarillo Plant

THE acquirement of all gas rights in 50,000 acres comprising the Cliffside helium-bearing gas field, near Amarillo, Texas, has been completed by the United States Bureau of Mines. This field supplies the raw material from which all helium used by the United States military services is extracted at the Amarillo helium plant, operated by the Bureau of Mines.

When production and conservation of helium for Governmental use was delegated by Congress to the Bureau of Mines in 1925, the old supply was failing and extraction costs were high. From the world war period, when members of its staff suggested production of helium for aeronautical use to the Army and Navy and directed experimental work to develop processes for its extraction, the Bureau of Mines has continued its studies of helium. Through these studies the area now known as the Cliffside field was found to contain gas of about 1½ per cent. helium content.

Production of helium at the Amarillo plant was started in April, 1929. In five years of operation, this plant has produced more than 57,000,000 cubic feet of helium, or about one-half of all of that element ever recovered in the world. Operating costs have been less than one-third of the lowest cost at which helium was ever obtained by the Government from any other source. Investment in helium plant, gas lands, wells, and pipe lines near Amarillo is about \$2,100,000. Expenditures in operation over the five year period have been \$666,600, and \$159,000 has been returned to the Treasury of the United States from sale of residue gas. The net operating cost of producing 57,487,000 cubic feet of helium has therefore been only \$507,624, or \$8.83 per thousand cubic feet. The lowest average cost over a year's period at which helium was ever obtained by the Government from any other source was about \$34 per thousand cubic feet. At that rate the 57,487,000 cubic feet that has been produced by the Amarillo plant would have cost \$1,954,558. The difference between that amount and the net operating cost at Amarillo is \$1,447,134, or 71 per cent. of the total investment.

Some Priestley Memories

Did he Resign his Fellowship of the Royal Society?

PROFESSOR RONALD A. MARTINEAU DIXON OF THEARNE, F.R.S. (Edin.), author of the article on "Joseph Priestley, the Father of Modern Chemistry," which appeared in THE CHEMICAL AGE of March 18, 1933 (page 243), on the occasion of Priestley's bicentenary, has issued, in the form of pamphlets, reprints of two recent contributions to the American "Journal of Chemical Education," one comprising "Some Letters of the Reverend Dr. Joseph Priestley, F.R.S." and the other "Did Priestley resign his Fellowship of the Royal Society?" The former is a collection of six letters written by Priestley to Matthew Boulton between 1775 and 1786, reproduced by permission of Mr. Arthur Westwood, master of the Assay Office at Birmingham.

In the latter pamphlet the author discusses the question whether Priestley resigned his Fellowship of the Royal Society and gives a large number of quotations which prove, at all events, that the father of modern chemistry was, to use his own words, "regarded in so unfavourable a light by the more considerable members (of the Royal Society) that he never went near them." The author's conclusion is that Priestley almost seems to indicate that he resigned but does not definitely say so. He adds that Dr. Tenney L. Davis has drawn attention to the fact that Priestley, "long after his departure from England, long after the Birmingham riot days, right up to his very last days, wrote 'F.R.S.' after his name on the title pages of his last pamphlets." Dr. Davis suggests that the report that Priestley resigned before he left England is "probably false." The author says: "'False' is a harsh word in English ears. Let us change it to 'mistaken.' Then let us say Dr. Davis is quite right in his surmise and that the Priestley writers and those others who may have spread the report have been or are mistaken. Priestley did *not* resign his Fellowship of the Royal Society, either before or after the Birmingham riots, nor did he either before or after he left England."

A Record of Industrial Achievement

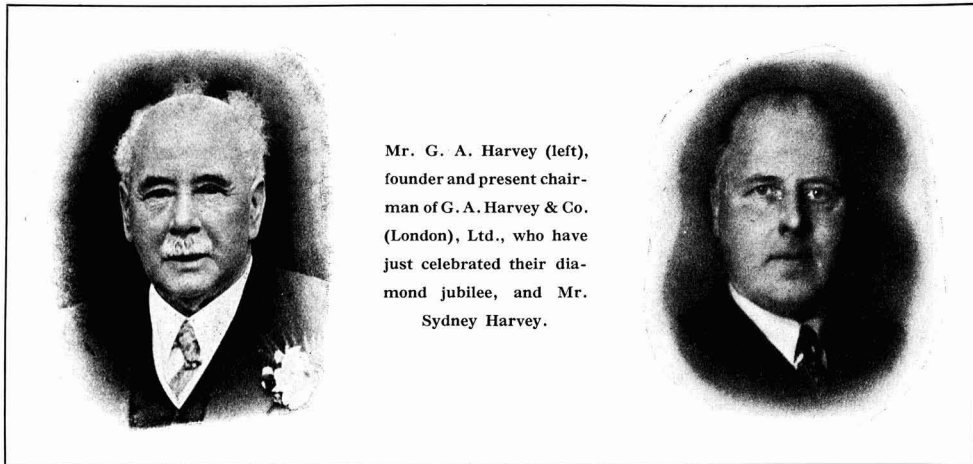
G. A. Harvey & Co. (London), Ltd., Celebrate Diamond Jubilee

SIXTY years of industrial progress—the growth of a manufacturing organisation from a one-man concern to a firm employing nearly 2,000 workpeople, and engaged in the equipment of a wide range of important industries all over the world—is the achievement which the well-known firm of G. A. Harvey and Co. (London), Ltd., celebrated on Saturday, July 7.

The actual form that the celebration took was purely of staff interest, but the record of consistent work and sustained

tion of pressure vessels, impregnating plant, fractionating towers, solvent recovery plant, etc. Separate departments exist for general engineering, galvanising, metal perforating, tank work, steel plate working, welding, wire-working and woven wire; and the machinery and general equipment of the factory is of the most modern description.

Perforated metal work was one of the earliest branches of production, and to-day it constitutes a highly important section of the firm's activities. The diversity of designs and



Mr. G. A. Harvey (left), founder and present chairman of G. A. Harvey & Co. (London), Ltd., who have just celebrated their diamond jubilee, and Mr. Sydney Harvey.

enthusiasm that have gone to the building of this progressive business contains the essentials of a story of much more than local concern. Success in the sphere of trade is usually the result of unflagging effort directed to a clearly-defined objective; more often than not, the impetus which leads to success is due to the urge of one man. The steady growth of G. A. Harvey and Co. is a case in point. The present chairman, Mr. G. A. Harvey, who founded the firm, brought into it a fine tradition of good workmanship and reliability in respect of goods and services, which is just as much in evidence to-day, now that he has relinquished direct control to his son, Mr. Sydney Harvey.

The firm began in the most inauspicious way imaginable. Sixty years ago Mr. G. A. Harvey started business by acquiring an old forge in Lewisham. This he converted into a workshop, and, with the assistance of one boy, carried on the business of a zinc worker, to which trade he had been apprenticed. In the short space of ten years Mr. Harvey had extended his field of supply to builders' merchants, ironmongers, etc., all over the country, and had launched out into other branches of production. Metal perforation—which has since assumed such immense proportions—commenced with the installation of a machine for turning out perforated zinc for household food safes. In addition to the factory at Lewisham, galvanising and tank-making works were established at Iron Wharf, Greenwich, in 1894. In 1913 the works in Woolwich Road, Greenwich, were acquired, and it is here that the present activities of the firm are concentrated.

On a visit to Harvey's works one may see fine wire cloth being woven, the resultant cloth, of the thinnest possible gauge of copper, bronze, or brass wire, being in consistency not much unlike a textile product. Wire of a thicker gauge is also woven on equally ingenious machines into lattice work; metals are perforated with every conceivable kind and size of perforation for innumerable industrial purposes. In addition a special section of the works is devoted to the construc-

sizes of perforation is amazing. Equally surprising is the number of purposes for which perforated metals are used, including basic processes such as the screening of coal, coke, ore, sand, and the sifting of food products and fine chemicals on the one hand, with ornamental work for radiator covers, electric heater covers, ventilators on the other hand. Every type of metal is now used, and one may mention as contrasting types of specialised production the making of filter floors for breweries and distilleries and plates for electric cables. Products from the woven wire department range from the finest woven wire cloth of as fine a mesh as 200 to the lineal inch, to the patent "Harco" Metalace, which is a comparatively recent achievement in ornamental wirework.

In the construction of heavy industrial plant G. A. Harvey and Co. have exceptional facilities. They do their own press work and possess a large range of standard dies for the production of dished and flanged ends of all sizes. Manufactures in this department include pressure vessels, vacuum drying, evaporating, and impregnating plant; tubular heaters, calandrias, heat exchangers and coolers; stills and condensers; agitators, digesters, extractors, filters, mixers, autoclaves and jacketed pans; food processing retorts and sterilisers, tar stills; storage tanks, up to 140 ft. diameter; water softening tanks; creosoting plant; solvent recovery plant; steel piping for ventilation and other pneumatic purposes; cyclones; tanks and hoppers.

SALES of Swedish chemical paper pulp were brisk during the first few months of the year, but have since fallen off somewhat. The statistical position is, however, satisfactory, as about 80 per cent. of the estimated yearly output for 1934 has already been sold. Further, a certain amount of sales for delivery in 1935 has been effected. The position for mechanical pulp has been favourable. The water shortage has, however, given rise to production difficulties in this branch of the pulp industry especially.

Institution of Chemical Engineers

Recent Movements of Members

THE following personal items are reported in the July issue of the "Quarterly Bulletin" of the Institution of Chemical Engineers:—

Professor H. E. Watson has been appointed to the Ramsay Chair of Chemical Engineering at University College, London, in succession to the late Professor W. E. Gibbs; Professor Watson was previously professor of general chemistry at the Indian Institute of Science, Bangalore. Mr. R. D. West has been appointed director and technical manager of Stockton Chemical Engineers and Riley Boilers, Ltd. Dr. H. D. H. Drane, formerly in charge of development work with the Thermal Syndicate, Ltd., and subsequently director of the Harcourt Butler Technological College, Cawnpore, is now established as a consultant in Liverpool. Mr. H. Morten has joined the staff of Messrs. Imperial Chemical Industries (India), Ltd. Mr. J. W. Phipps has been appointed chief engineer to British Drug Houses, Ltd. Mr. W. S. Richards is now with Imperial Chemical Industries (Rexine), Ltd. Dr. W. L. Wood has joined the Distillers Co., Ltd. Mr. W. J. R. Doran is now with John McNeill, Ltd., of Belfast. Mr. G. Finlayson has gone to the Gold Coast as assistant metallurgist to the Ashanti Goldfields Corporation. Mr. A. Gillies has accepted an appointment with the Grassmoor Co., Ltd., Chesterfield. Mr. D. R. Tunks has been appointed engineer to N. Terry and Co. (East Kent), Ltd. Mr. A. Webster has joined the staff of the Royal Naval Cordite Factory, Holton Heath. Mr. A. S. White has joined I.C.I., Ltd. (Dyestuffs Group), in Manchester. Mr. F. R. Wright has been appointed superintendent of the galvanising factory of Richard Johnson and Nephew. Mr. F. H. Choppin has received an appointment with Burroughs Wellcome and Co., Ltd. Mr. M. I. Freeman has joined the staff of the National Smelting Co., Ltd., at Avonmouth. Dr. E. H. T. Hoblyn is now with the British Xylonite Co., Ltd.

Italian Chemical Industry

Montecatini Continues to Show Profit

IN its annual report the Montecatini concern stated that its group gave employment 6 days per week to 25,346 workmen and 2,104 other employees in 1933, as against 21,186 workmen and 1,763 other employees in 1932 and 20,133 workmen and 1,603 other employees in 1931. Net profit for 1933 reached 65,672,000 lire, compared with 53,100,000 lire in 1932 and 64,296,500 in 1931. The Montecatini group, in addition to manufacturing some 100 chemicals, extends its activities into sulphur, pyrites, copper, zinc, lead, and lignite mines, marble quarries and marble works, sawmills, jute and rayon factories, hydroelectric power stations, electric railways, steamers, and aluminium works. Its properties are scattered over all Italy and Sicily.

National Physical Laboratory

Latest Publications

PAPERS read or published from the National Physical Laboratory during May and June included:—

"Condensed Tables for Colour Computation." By T. Smith, F.Inst.P., F.R.S. Published in the "Proceedings of the Physical Society," 46, 372.

"A Colour Correction Filter for Photoelectric Photometry." By J. S. Preston, A.M.I.E.E., and R. H. McDermott, B.Sc., A.R.C.S., D.I.C. Published in the "Journal of Scientific Instruments," 11, 150.

"Note on the Preparation of Pure Anhydrous Sodium Carbonate." By W. H. Withey. Published in the "Journal of the Society of Glass Technologists," 18, 69.

"Determination of Small Quantities of Fluorides in Water." By G. Barr, D.Sc., and A. L. Thorogood, B.Sc. Published in "The Analyst," 59, 378.

"Some Factors Affecting the Setting of a Dental Amalgam. Part 2." By Miss M. L. V. Gayler, D.Sc. Published in the "British Dental Journal," 56, 605.

Lawn Tennis Tournament

Cup Holder Beaten in Third Round

THE third round matches in THE CHEMICAL AGE Lawn Tennis Tournament are now in progress. The first result to reach us in this round was the defeat of C. G. Copp (Doulton and Co., Ltd.), holder of THE CHEMICAL AGE singles challenge cup, by L. Giltrow (Williams, Hounslow, Ltd.), the scores being 6-3, 7-5. R. N. B. D. Bruce (Gas Light and Coke Co.) has received a walk-over, his opponent, H. A. Hare (Grindley and Co., Ltd.), having scratched.

In the fourth round of the singles, Giltrow will meet either L. F. Grape (Borax Consolidated, Ltd.) or R. Welsh (British Oxygen Co., Ltd.), whose third round result had not reached us at the time of writing. Bruce will meet either H. R. Whittaker (Williams, Hounslow, Ltd.) or A. Collins (British Oxygen Co., Ltd.).

In the third round of the doubles, V. J. Prosser and A. Baxter (John Haig and Co., Ltd.) have defeated E. H. M. Badger and R. N. B. D. Bruce (Gas Light and Coke Co.) by 6-3, 6-4.

Czechoslovak Chemical Industry

A General Decline in Exports

THE Federation of the Czechoslovak Chemical Industry recently held its annual general meeting at Prague, when the report presented for 1933 stated that the chemical trade had been passing through a similar development as the other industries of the country. The improvement which was shown in world trade and production had not in 1933 found expression in Czechoslovakia. On the contrary, the past year had brought a further decline in the sales of the more important items of output. The decline in sales compared with 1932 was not so pronounced as in preceding years, but that fact represented neither a stabilisation of conditions nor an improvement. The chemical industry of Czechoslovakia had been able at least in certain places to make good the loss of sales in respect of existing products by turning out new categories of products. In the heavy chemical industry this introduction of new production had been successful at least in a partial increase of the total turnover as compared with the preceding year.

In export trade the various branches of the Federation showed considerable diversity. A whole series of important markets was lost, and despite intensive efforts to utilise all the possibilities of quota business and to gain new markets it was found impossible to increase exports of inorganic products. Only in the case of coal tar dyestuffs and organic intermediate products was it found possible to increase export trade. It was increasingly clear that export trade with the main markets in inorganic wholesale products (the Danubian and Balkan States) was steadily dying out. In those countries there was being systematically built up under the protection of high tariffs and import prohibitions a chemical industry which was destined to meet the needs of the newly-erected textile and other factories, as well as the demands arising for purposes of defence.

In the Little Entente countries the imports of chemicals were checked by the lack of quota arrangements. In Poland a chemical industry was being built up, and was being protected by prohibitive tariffs at a moment when the output of the domestic factories was inadequate to meet the country's own requirements. These unfavourable tendencies compelled the Czechoslovak industry to make good the loss in export trade by the production of special high-value wares, especially in the organic branch, that is, of chemicals which on account of the complicated process of manufacture cannot yet be made abroad, and thus still present certain prospects for export trade.

Export trade in chemicals to other parts of Europe and to overseas countries was exposed to keen competition, intensified in part by the decline in the dollar and sterling exchanges, and by the working of the German scrips. Low prices had frequently compelled the industry to renounce such export for the reason that it no longer paid. Not until just recently was there a hope that the crisis had passed its worst point, and that now a real, if very gradual, improvement was to be anticipated.

Petroleum—Whitehall Brand

The Privileged Position of Oil

COMMENTING on the debate on the Petroleum Bill in the House of Commons last week, reported in THE CHEMICAL AGE, "The Independent" of July 7 says: "It did nothing whatever to bring to the surface any oil which may be hiding beneath our island soil, but it gave to opposing parties the opportunity to unite against the measure. It was alleged on the one hand that Mr. Runciman was the tool of the oil magnates and was scheming on their behalf to establish the principle of monopolistic profit-making. On the other hand, there were those who saw in the proposal the acceptance, by the President of the Board of Trade, of the pure doctrine of Communism. We are not particularly impressed by either line of argument. In our view the Bill has no importance, for the chance of big oil developments in these latitudes is far too remote; but we are concerned with this further spread of the notion that economic progress is a proper Governmental function. No economic progress has ever yet come out of Government action, and we doubt if anything of the kind is likely to happen in the future. To have nationalised petroleum does not matter very much, but to have accepted the principle of nationalism matters a great deal more. If it should happen that a little oil can be squeezed out of this island, several other things will also happen. Oil, which is owned by the Government, will be in a privileged position, and the force of the Government will be applied not to the supply of oil to needy consumers, but to the safeguarding of the interest of the few people interested in the production of our own nationalised property."

Transport of Raw Rubber

Paper Cases to Cheapen Packing Costs

AN interesting experiment has just been made by shipping raw rubber in paper cases instead of wood. There have been many difficulties to contend with in the transportation of rubber so that it should arrive at the manufacturer's works clean and unaffected. Among these are freedom from wood chips, and as the weight of the package has always been a feature, plywood has been found satisfactory in this respect. When roughly handled, however, it is liable to splinter and although metal edges have been used, the necessary nailing of these has caused fractures. In some instances, indeed, the metal corners dropped on another case have burst the plywood and splintered the rubber. Japanese cases made from native woods have been cheaper, but the wood is still more liable to splinter. The average weight of a case of rubber does not exceed two hundredweights.

According to the current issue of the "Rubber Age," the new method is to pack the rubber in Kraft paper. The cases are made in two sections, somewhat similar to the two halves of a cigar case which close one over the other. The block of rubber sheets is inserted in one and the other half of the cover closes over it, an adhesive hermetically closing the package. These paper covers are made of four thicknesses of paper; one end of each half is closed by a special stitching which can be opened easily by pulling a red rip thread for sampling, inspection, or for the removal of the contents. The paper, not being stuck together, allows some air to remain between the layers, which acts as a cushion and permits of easier removal of the rubber.

The trial shipment, which has come from the Federated Malay States, has just been landed in London; it had been transhipped at Antwerp, and so had extra handling. In spite of this, it was in excellent condition. These packages weighed about one hundredweight each, being about half the weight of the usual cases. The rubber was smoked sheet, some of which had been treated on the outside layers with talcum powder. The advantages claimed for the paper packing are cheapness, the paper packing costing less than half that of plywood. These paper paper containers occupy very much less space than empty wooden cases, a bale of 250 measuring 20 in. by 20 in. by 25 in., which is obviously an enormous saving in freight to the plantations.

Memorial to Wollaston

A Pioneer in the Study of Platinum Metals

AN interesting ceremony was performed on July 4, when a memorial plaque to William Hyde Wollaston, chemist and natural philosopher, was unveiled at 14 Buckingham Street, London, W. 1, where Wollaston lived for 25 years.

Born at East Dereham, Norfolk, in 1766, Wollaston was educated at Charterhouse and Caius College, Cambridge, and was elected a Fellow of the Royal Society in 1793. His original work, which is of a very diverse nature, deals mainly with chemical subjects, and he made a special study of the platinum metals. He discovered how to work platinum on a practical scale, and was the first to detect palladium and rhodium. The latter, it may be noted, have been recently applied in the form of electro-deposited coatings to give an untarnishable finish to other metals; palladium, moreover, is becoming increasingly popular for jewellery and has important uses in dental alloys, for artificial silk spinnerettes, for electrical contacts and as a catalyst in chemical processes. On his death in 1828, Wollaston left a sum of money for "the promotion of researches concerning the mineral structure of the earth," in connection with which a medal, bearing his name, is awarded annually by the Council of the Geological Society of London.

An appreciation of Wollaston's scientific work was given in an address by Sir Frederick Gowland Hopkins, President of the Royal Society, who afterwards unveiled the plaque.

Ontario Nickel Industry

Quarterly Production Statistics

DURING the quarter ended March 31, 666,147 tons of nickel-copper ore were smelted in Ontario, as against 141,908 tons during the corresponding period of 1933 and 316,253 tons during the same months in 1932. Copper recovery in blister form aggregated 39,344,122 lb. as against 24,424,005 lb. during the first quarter of 1933 and 16,632,415 lb. during the same months in 1932.

Bessemer matte produced totalled 36,100 tons with a nickel content of 32,426,987 lb. and a copper content of 23,314,349 lb. Corresponding figures for 1933 and 1932 are respectively 8,704 tons of bessemer matte in 1933 (nickel content 6,798,197 lb., copper content 6,386,111 lb.); 13,666 tons in 1932 (nickel content 11,479,854 lb., copper content 10,167,536 lb.). Exports of matte rose from 7,992 tons in 1932 to 6,624 tons in 1933 and to 10,293 tons in 1934, whilst there was refined in Canada 12,996 tons as against 2,223 tons in 1933 and 782 tons in 1932.

Canadian Radium Situation

Prospects for Ore Concentration

SCARCELY four years after the initial discovery of radium ore at Great Bear Lake, the Northwest Territories, Canada, has become an important producer of radium, with Eldorado Gold Mines, Ltd., maintaining a steady production from its well-equipped refinery at Port Hope, Ontario, where the output already amounts to a few thousand milligrams. This company, which operates the Labine Point deposits at Great Bear Lake, is confident of its ability to continue to deliver a steady output of radium, according to a communication from the Federal Department of Mines, Ottawa. In addition to radium, the company produces important quantities of uranium compounds, which enjoy an active demand, with the bulk of the present output going to Great Britain.

Satisfactory arrangements have been made whereby ore will be shipped from Great Bear Lake to the railroad at Waterways, Alberta, by aeroplane during the winter months, thus avoiding any shut-down at the extraction plant. Tests are under way as to a method of concentrating the ore at the mine in order to step up the grade, and thus reduce freight costs. Such concentration, if feasible, will be carried out in the recently erected mill on the company's Labine Point property.

Continental Chemical Notes

THE CEODEUX CO., OF LINTGEN, Luxembourg, has embarked upon the manufacture of solid and liquid carbon dioxide.

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WITH A CAPITAL OF 2 MILLION LEI, the "Alba" concern has been established in Bucharest and will manufacture chemicals for the textile, leather and paper industries.

* * *

CZECHO-SLOVAKIA IS COMPLETELY DEPENDENT upon foreign sources for its electroplating salts, according to a writer in "Wirtschaft," of Prague. The manufacture of nickel, tin and chromium salts by home producers is therefore urged.

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DENATURED ALCOHOL SALES IN ITALY are suffering from keen competition of synthetic methanol, the output of which, as pointed out in the annual report of the Distillerie Italiane, is unabatedly increasing. Sales of anhydrous power alcohol declined from 115,000 hectolitres in 1932 to 83,000 hectolitres in 1934.

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THE HUNGARIAN DEMAND FOR SUPERPHOSPHATES fell off considerably during the past year owing to the critical position of agriculture, reports the "Hungaria" Artificial Fertiliser, Sulphuric Acid and Chemical Co., of Budapest, which closed the year with a small net profit (carried forward) of 4,920 pengo. To offset the disappointing results in the fertiliser department, new activities have been initiated. Encouraging results were achieved in respect of sulphuric acid and other acids and salts, including copper sulphate. Conditions in the glue market showed a slight improvement following on more activity in the building industry, but the company's stocks are still very large.

OIL-PROSPECTING OPERATIONS in Zisterdorf, Austria, have resulted in a strike at 925 metres depth.

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GOVERNMENT MEASURES aiming at an increase in the Lithuanian rosin production to over 2,000 tons per annum, will be initiated in the near future.

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FOLLOWING NEGOTIATIONS between Polish casein producers and the plywood industry, the price of casein is now reduced by 15 to 18 per cent. The f.o.r. price for casein (lump) has been fixed at 1.15 zloty per kilo. until October 1.

* * *

PRIMARY BASES WERE THE MAIN PRODUCTS of pitch distillation in recent experiments of Hofmann and Boente ("Brennstoff-Chemie," 1933, No. 20, p. 381), who isolated dimethyl pyridine (coking temperature not exceeding 190°C.), orthotoluidine (190°C. to 220°C.), quinoline, isoquinoline and quinaldine (220°C. to 260°C.).

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PAPER SUPERFICIALLY ESTERIFIED with chlorstearic anhydride is less hygroscopic and therefore more efficient for dielectric equipment. According to Soletchnik and Motovilova ("Boumujn. Prom.," 1933, No. 10, p. 39), the reaction mixture comprised 1 part paper, 10 parts quinoline, 11.5 parts of chlorstearic anhydride and 38 parts xylol. The percentage hygroscopicity before and after treatment was 11.3 and 2.2 and the paper underwent a weight increase of 173 per cent. The new material is claimed to offer advantages over insulating varnishes based upon the usual cellulose esters. No solvents or plasticisers are required owing to the fundamental flexibility of the cellulose esters of long chain fatty acids.

News from the Allied Industries

Sugar

THE CENTRAL SUGAR CO. (which is controlled by Tate and Lyle, Ltd.) has decided that capital should be adjusted in accordance with the assets and working capital. It is proposed to increase the nominal capital from £200,000 to £400,000, and the terms of an issue of new capital will be announced later in the current financial year. By that time, the directors state, the conditions under which the beet sugar industry in this country will continue to operate will have been settled.

Compressed Gases

ACTIVE DEALINGS have been reported in the ordinary stock units of the British Oxygen Co. These £1 units have been steadily advancing in price for some time past, and have now established a new high level. The reason for the demand is due partly to the news that certain interests "friendly to the company" are taking over British Industrial Gases, Ltd., and partly to reports of continued improvement in the company's business as a result of the increased activity in the steel and allied trades.

Disinfectants

SANITAS TRUST, LTD., held an extraordinary general meeting on July 5, to consider a scheme of arrangement. After Mr. W. K. Steedman, who presided, had explained the scheme, Mr. Robert S. Levy contended that it was unfair to the preference shareholders, and proposed that it should be referred back to the directors. The chairman ruled the proposition out of order. On a show of hands the resolution was lost. The chairman demanded a poll, the result of which was as follows: For the resolution, 474,930 votes; against, 29,317 votes. The chairman thereupon declared the resolution carried by the statutory majority. At the separate meeting of the preference shareholders which followed, the scheme was approved on a poll by 345,997 votes to 20,227.

Dyeing and Cleaning

THE SCOTTISH COUNCIL of the Amalgamated Society of Dyers and Kindred Workers at a conference held in Glasgow on July 7, agreed to amend their demands to harmonise with the proposals of the union in England. Employers in the piece-goods trade are to be asked for a conference to consider the amended proposals, which are:—Men, minimum base rates to be advanced from 30s. 3d. to 34s. per week of 48 hours; women, minimum base rates to be advanced from 18s. to 21s. per week of 48 hours. All piece-work rates are to be capable of yielding a minimum of 35 per cent. in excess of the recognised base rate of time workers. The base rate, with the cost-of-living addition plus the amount from the Macmillan award, bring the present wages of adult males to 45s. per week and of women to 26s. per week. About 3,000 employees in Glasgow, Lanarkshire, Dumbartonshire and Renfrewshire are affected.

Glue

SPEAKING at the 14th ordinary general meeting of British Glues and Chemicals, Ltd., held in London, on July 4, Mr. T. Walton, the chairman of the company, said their research department continues actively and progressively and, as members of an international association, the company has taken an active part in organising an exploration throughout the world to find new profitable uses for glue, with encouraging results. The outlook in regard to glues is a little brighter; productions in the more modern pearl or bead, and flake, powder, and liquid forms, are of high quality and are found in many cases to be far more convenient in use. The soap development has given the company the advantage of utilisation of some of their own production of special fats and greases, the market requirement of which has been small and the price low, and the outlook for which is not encouraging, the extraordinarily good results obtained by cattle feeding stuffs and fertilisers encourage anticipation of further increased trade in those directions.

Weekly Prices of British Chemical Products

Review of Current Market Conditions

PRICES for the chief nitrogen fertilisers which have been in force for March/June apply for all prompt business. Most sections of the chemical market have been moderately busy during the week and prices have been steadily maintained. Good business has been transacted in acetone, ammonium chloride, formaldehyde, formic acid and oxalic acid. Keen competition continues in respect of formaldehyde orders, and the price in London has been reduced from £27 to £26 per ton. Other products for which there has been a fairly active demand are acetic acid, anhydrous ammonia, sodium acetate and caustic soda. Only a limited inquiry has been received for barium chloride, potassium chlorate and sodium sulphide, and the arsenic market is still unsettled. Wood distillation products are in steady demand, considerable interest still being shown in charcoal, although stocks are now rather higher than during the past few months. In the coal tar products section demand for cresylic acid, creosote oil, and pyridine has been on a fairly active scale, but there has been very little new business in other products. Business in pharmaceutical chemicals has been about average for the time of year, and prices are maintained. Aspirin, benzoic acid, citric acid, cream of tartar, sodium benzoate and tartaric acid have been about the best items. There is less inquiry for bromides, and phenolphthalein is a dull item. The essential oils market has been fairly active, important price changes being increased rates for sweet orange and Wayne County peppermint, and reductions for English clove, lemon and lemon-grass.

LONDON.—Business in the London chemical market remains steady with prices firm generally. Apart from the reduction in the price of formaldehyde already referred to, the only price change reported is a rise of a farthing per lb. in potassium permanganate. The coal tar products market remains quiet, with no change in prices from last week.

MANCHESTER.—The test match at Manchester has been a strong counter attraction to the markets on the Royal Exchange here this week and business in chemicals seems to have been affected in common with most others. In addition, about a round score of Lancashire towns have been on holiday all this week, and as many of them contribute to no small extent to the consumption of chemical products in the district there has been a fairly substantial interference with deliveries, to say nothing of new business. On the whole, however, apart from these two major influences business has been fairly well maintained. Although there has been no very substantial forward contract buying reported here during the past week a moderate volume of spot and early delivery business has been put through and the market has been steady to firm in virtually every department. Certainly, there has been very little reaction compared with the values current last week although the weakness of the lead market is causing users to study the position of the acetates and other lead products.

SCOTLAND.—Business in the Scottish heavy chemical market is reported to be practically at a standstill at the moment. Prices remain unchanged.

Price Changes

General.—ACID, TARTARIC (Manchester), 1s. 0½d. per lb.; FORMALDEHYDE (London) £26 per ton; POTASH, CAUSTIC (Manchester) £38 per ton; POTASSIUM PERMANGANATE (London), 9½d. per lb.

Perfumery Chemicals.—CITRAL, 6s. per lb.; RHODINAL, 58s. per lb.

Essential Oils.—CLOVE, English, 90/92%, 3s. 8d. per lb.; LEMON, 4s. 3d.; LEMONGRASS, 4s. 3d.; ORANGE, sweet, 7s. 9d.; PEPPERMINT, Wayne County, 14s. 9d.

Coal Tar Products.—ACID, CARBOLIC (Manchester), crystals, 7½d. to 8d. per lb., crude, 2s. per gal.; CREOSOTE, B.S.I. specification, 4d. to 4½d. per gal.; PYRIDINE, 90/140, 7s. 6d. to 9s. per gal.

All other prices remain unchanged.

General Chemicals

ACETONE.—LONDON: £65 to £68 per ton; SCOTLAND: £66 to £68 ex wharf, according to quantity.

ACID, ACETIC.—Tech. 80%, £38 5s. to £40 5s.; pure 80% £39 5s.; tech., 40%, £20 5s. to £21 15s.; tech., 60%, £23 10s. to £30 10s. LONDON: Tech., 80%, £38 5s. to £40 5s.; pure 80%, £39 5s. to £41 5s.; tech., 40%, £20 5s. to £22 5s.; tech., 60%, £29 5s. to £31 5s. SCOTLAND: Glacial 98/100%, £48 to £52; pure 80%, £39 5s.; tech. 80%, £38 5s. d/d buyers' premises Great Britain. MANCHESTER: 80%, commercial, £39; tech. glacial, £52.

ACID, BORIC.—Commercial granulated, £25 10s. per ton; crystal, £26 10s.; powdered, £27 10s.; extra finely powdered, £29 10s. packed in 1-cwt bags, carriage paid home to buyers' premises within the United Kingdom in 1-ton lots.

ACID, CHROMIC.—10½d. per lb., less 2½%, d/d U.K.

ACID, CITRIC.—9d. per lb. less 5%.

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

ACID, FORMIC.—LONDON: £43 10s. per ton.

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

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

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

ACID, OXALIC.—LONDON: £47 17s. 6d. to £57 10s. per ton, according to packages and position. SCOTLAND: 98/100%, £48 to £50 ex store. MANCHESTER: £49 to £53 ex store.

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

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

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

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

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

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

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

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

AMMONIUM CHLORIDE.—£37 to £45 per ton, carriage paid. LONDON: Fine white crystals, £18 to £19. (See also Salammoniac.)

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

ANTIMONY OXIDE.—SCOTLAND: Spot, £26 per ton, c.i.f. U.K. ports. ANTIMONY SULPHIDE.—Golden 6½d. to 1s. 1½d. per lb.; crimson, 1s. 3d. to 1s. 5d. per lb., according to quality.

ARSENIC.—LONDON: £16 10s. c.i.f. main U.K. ports for imported material; Cornish nominal, £22 10s. f.o.r. mines. SCOTLAND: White powdered, £23 ex wharf. MANCHESTER: White powdered Cornish, £21 ex store.

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

BARIUM CHLORIDE.—£11 per ton.

BARYTES.—£7 to £8 10s. per ton.

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

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

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

CADMIUM SULPHIDE.—2s. 7d. to 2s. 11d.

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

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

CARBON BLACK.—3½d. to 5d. per lb. LONDON: 4½d. to 5d.

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

CHROMIUM OXIDE.—10½d. per lb., according to quantity

d/d U.K.; green, 1s. 2d. per lb.

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

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

CREAM OF TARTAR.—LONDON: £4 2s. 6d. per cwt.

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

DIPHENYLGUANIDINE.—2s. 2d. per lb.

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

LAMPBLACK.—£45 to £48 per ton.

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

per ton less. MANCHESTER: White, £34; brown, £31 10s.
LEAD NITRATE.—£28 per ton.
LEAD, RED.—SCOTLAND: £25 10s. to £28 per ton d/d buyer's works.
LEAD, WHITE.—SCOTLAND: £39 per ton, carriage paid. LONDON: £37 10s.
LITHOPONE.—30%, £17 10s. to £18 per ton.
MAGNESITE.—SCOTLAND: Ground calcined, £9 per ton, ex store.
METHYLATED SPIRIT.—61 O.P. Industrial, 1s. 6d. to 2s. 1d. per gal. 'Pyrimidised industrial, 1s. 8d. to 2s. 3d. Mineralised, 2s. 7d. to 3s. 1d. 64 O.P. ld. extra in all cases. Prices according to quantities. SCOTLAND: Industrial 64 O.P., 1s. 9d. to 2s. 4d.
NICKEL AMMONIUM SULPHATE.—£49 per ton d/d.
NICKEL SULPHATE.—£49 per ton d/d.
PHENOL.—8½d. to 9d. per lb. without engagement.
POTASH, CAUSTIC.—LONDON: £42 per ton. MANCHESTER: £38.
POTASSIUM BICROMATE.—Crystals and Granular, 5d. per lb. net d/d U.K. Discount according to quantity. Ground 5½d. LONDON: 5d. per lb. with usual discounts for contracts. SCOTLAND: 5d. d/d U.K. or c.i.f. Irish Ports. MANCHESTER: 5d.
POTASSIUM CHLORATE.—LONDON: £37 to £40 per ton. SCOTLAND: 99½/100%, powder, £37. MANCHESTER: £37 to £38.
POTASSIUM CHROMATE.—6½d. per lb. d/d U.K.
POTASSIUM NITRATE.—SCOTLAND: Refined granulated, £23 per ton c.i.f. U.K. ports. Spot, £30 per ton ex store.
POTASSIUM PERMANGANATE.—LONDON: 9½d. per lb. SCOTLAND: B.P. crystals, 9d. MANCHESTER: Commercial, 8½d.; B.P., 9½d. to 9½d.
POTASSIUM PRUSSIAN.—LONDON: 8½d. to 8½d. per lb. SCOTLAND: Yellow spot material, 8½d. ex store. MANCHESTER: Yellow, 8½d.
RUPRON (MINERAL RUBBER).—£16 10s. per ton.
SALAMMONIAC.—First lump spot, £41 17s. 6d. per ton d/d in barrels.
SODA ASH.—58% spot, £5 15s. per ton f.o.r. in bags.
SODA, CAUSTIC.—Solid 76/77% spot, £13 17s. 6d. per ton d/d station. SCOTLAND: Powdered 98/99%, £17 10s. in drums, £18 5s. in casks, Solid 76/77%, £14 10s. in drums; 70/73%, £14 12s. 6d., carriage paid buyer's station, minimum 4-ton lots; contracts 10s. per ton less. MANCHESTER: £13 5s. to £14 contracts.
SODA CRYSTALS.—Spot, £5 to £5 5s. per ton d/d station or ex depot in 2-cwt. bags.
SODIUM ACETATE.—£22 per ton. LONDON: £23.
SODIUM BICARBONATE.—Refined spot, £10 10s. per ton d/d station in bags. SCOTLAND: Refined recrystallised £10 15s. ex quay or station. MANCHESTER: £10 10s.
SODIUM BICROMATE.—Crystals cake and powder 4d. per lb. net d/d U.K. discount according to quantity. Anhydrous, 5d. per lb. LONDON: 4d. per lb. net for spot lots and 4d. per lb. with discounts for contract quantities. SCOTLAND: 4d. delivered buyer's premises with concession for contracts.
SODIUM BISULPHITE POWDER.—60/62%, £18 10s. per ton d/d 1-cwt. iron drums for home trade.
SODIUM CARBONATE (SODA CRYSTALS).—SCOTLAND: £5 to £5 5s. per ton ex quay or station. Powdered or pea quality 7s. 6d. per ton extra. Light Soda Ash £7 ex quay, min. 4-ton lots with reductions for contracts.
SODIUM CHLORATE.—£32 per ton.
SODIUM CHROMATE.—4d. per lb. d/d U.K.
SODIUM HYPOSULPHITE.—SCOTLAND: Large crystals English manufacture, £9 5s. per ton ex stations, min. 4-ton lots. Pea crystals, £15 ex station, 4-ton lots. MANCHESTER: Commercial, £9 5s.; photographic, £15.
SODIUM META SILICATE.—£16 per ton, d/d U.K. in cwt. bags.
SODIUM NITRATE.—LONDON: Spot, £18 to £20 per ton d/d station in drums.
SODIUM PERBORATE.—LONDON: 10d. per lb.
SODIUM PHOSPHATE.—£13 per ton.
SODIUM PRUSSIAN.—LONDON: 5d. to 5½d. per lb. SCOTLAND: 5d. to 5½d. ex store. MANCHESTER: 4½d. to 5½d.

Coal Tar Products

ACID, CARBOLIC.—Crystals, 8½d. to 8½d. per lb.; crude, 60's, 2s. 1½d. to 2s. 2½d. per gal. MANCHESTER: Crystals, 7½d. to 8d. per lb.; crude, 2s. per gal. SCOTLAND: 60's, 2s. 6d. to 2s. 7d.
ACID, CRESYLIC.—90/100%, 1s. 8d. to 2s. 3d. per gal.; pale, 98%: 1s. 6d. to 1s. 7d.; according to specification. LONDON: 98/100%, 1s. 6d.; dark, 95/97%, 1s. 3d. SCOTLAND: Pale, 99/100%, 1s. 3d. to 1s. 4d.; dark, 97/99%, 1s. to 1s. 1d.; high boiling acid, 2s. 6d. to 3s.
ANTHRACENE OIL.—Strained, 4½d. per gal.
BENZOL.—At works, crude, 9d. to 9½d. per gal.; standard motor, 1s. 3½d. to 1s. 4d.; 90%, 1s. 4d. to 1s. 4½d.; pure, 1s. 7½d. to 1s. 8d. LONDON: Motor, 1s. 6½d. SCOTLAND: Motor, 1s. 6½d.
CREOSOTE.—B.S.I. Specification standard, 4d. to 4½d. per gal. f.o.r. Home, 3½d. d/d. LONDON: 3½d. f.o.r. North; 4d. LONDON. MANCHESTER: 3½d. to 4½d. SCOTLAND: Specification oils, 4d.; washed oil, 4½d. to 4½d.; light, 4½d.; heavy, 4½d. to 4½d.

NAPHTHA.—Solvent, 90/160%, 1s. 6d. to 1s. 7d. per gal.; 95/160%, 1s. 7d. to 1s. 8d.; 99% 11d. to 1s. 1d. LONDON: Solvent, 1s. 3½d. to 1s. 4d.; heavy, 11d. to 1s. 0½d. f.o.r. SCOTLAND: 90/160%, 1s. 3d. to 1s. 3½d.; 90/190%, 11d. to 1s. 2d.
NAPHTHALENE.—Purified crystals, £9 15s. per ton in bags. LONDON: Fire lighter quality, £3 to £3 10s.; 74/76 quality, £4 to £4 10s.; 78/78 quality, £5 10s. to £6. SCOTLAND: 40s. to 50s., whizzed, 70s. to 75s.
PITCH.—LONDON: £3 to £3 1s. per ton f.o.b. East Coast port for next season's delivery.
PYRIDINE.—90/140, 7s. 6d. to 8s. per gal.; 90/180, 2s. to 2s. 3d. per gal.
TOLUOL.—90%, 2s. 2d. per gal.; pure, 2s. 5d.
XYLOL.—Commercial, 2s. 2d. per gal.; pure, 2s. 4d.

Nitrogen Fertilisers

SULPHATE OF AMMONIA.—Home: £7 5s. per ton delivered in 6-ton lots to farmer's nearest station. Export: Nominal £5 17s. 6d. per ton f.o.b. U.K. ports in single bags.
CYANAMIDE.—£7 5s. per ton carriage paid to any railway station in Great Britain in lots of 4 tons and over.
NITRATE OF SODA.—£7 18s. 6d. per ton delivered in 6-ton lots to farmer's nearest station.
NITRO-CHALK.—£7 5s. per ton delivered in 6-ton lots to farmer's nearest station.
CONCENTRATED COMPLETE FERTILISERS.—£10 15s. to £11 6s. per ton according to percentage of constituents.
NITROGEN PHOSPHATE FERTILISERS.—£10 5s. to £13 15s. per ton according to percentage of constituents.

Latest Oil Prices

LONDON, July 11.—LINED OIL was very firm. Spot, £22 10s. (small quantities, 30s. extra); July, £21; Aug., £21 2s. 6d.; Sept.-Dec., £21 5s.; Jan.-April, £21 2s. 6d., naked. SOYA BEAN OIL was steady. Oriental (bulk), July-Aug. shipment, £12 15s. per ton. RAPE OIL was quiet. Crude extracted, £27; technical refined, £28 10s. naked, ex wharf. COTTON OIL was quiet. Egyptian crude, £12 10s.; refined common edible, £15 10s.; deodorised, £17, naked, ex mill (small lots 30s. extra). TURPENTINE was steady. American, spot, 41s. 9d. per cwt.
HULL.—LINED OIL, spot, £21 7s. 6d.; July-Aug. and Sept.-Dec., £20 17s. 6d.; Jan.-April, £20 15s. COTTON OIL, Egyptian crude, £12 10s.; edible refined and technical, £14 10s.; deodorised, £16 10s. naked. PALM KERNEL OIL, crude, f.m.q., spot, £14, naked. GROUNDNUT OIL, extracted, spot, £18 10s.; deodorised, £22 10s. RAPE OIL, extracted, spot, £26; refined, £27 10s. SOYA OIL, extracted, spot, £15; deodorised, £18 per ton. COD OIL (industrial), 25s. per cwt. barrels. CASTOR OIL, pharmaceutical, barrels, spot, 35s. 6d.; first, 30s. 6d.; second, 27s. 6d. TURPENTINE, spot, 43s. 9d. per cwt.

Company News

Belliss and Morcom.—The net profit to March 31 last, after depreciation, amounted to £8,284, against £4,226 in the previous year. A final dividend is announced on the ordinary shares of 5 per cent., making 10 per cent., tax free, for the year.

W. and T. Avery, Ltd.—A net profit of £102,925, is reported for the year to March 31, 1934, compared with £95,512 for the previous year. The ordinary dividend is maintained at 15 per cent. and £10,000 against nil is placed to reserve, making that fund £360,000, and leaving £59,590, compared with £59,124, to go forward.

Distillers Co., Ltd.—The accounts for the year to May 15, 1934, after providing for interest on the debenture stocks, show a balance of £2,140,622, an increase of £16,494 on the balance shown in the previous year's accounts. The ordinary dividend is increased from 17½ per cent. to 20 per cent.; £250,000 is placed to reserve, and £100,000 is transferred to superannuation and provident fund, leaving £316,330, compared with £263,421 to go forward.

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).

Austria.—An agent established at Vienna wishes to obtain the representation, on terms to be agreed, of United Kingdom exporters of all kinds of shellac. (Ref. No. 38.)

Argentina.—An agent in Buenos Aires wishes to obtain the representation, on a commission basis, of United Kingdom manufacturers of industrial chemicals for the soap, battery, accumulator, glass, paint and varnish industries, fine chemicals and raw materials used in the manufacture of cosmetics, perfumes, toilet preparations, tooth pastes, etc. (Ref. No. 49.)

Inventions in the Chemical Industry

Patent Specifications and Applications

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

Complete Specifications Open to Public Inspection

DEODORISATION of noxious gases, process and apparatus.—Soc. du Gaz de Paris. Dec. 27, 1932. 33548/33.
 INDIGOID DYESTUFFS, manufacture.—Soc. of Chemical Industry in Basle. Dec. 27, 1932. 36129/33.
 DIBENZANTHRONE SERIES, manufacture of compounds.—E. I. du Pont de Nemours and Co. Dec. 27, 1932. 36207/33.
 DYESTUFFS of the benzanthrone series, manufacture.—E. I. du Pont de Nemours and Co. Dec. 27, 1932. 36209/33.
 ORGANIC OXIDATION PRODUCTS, preparing.—J. R. Short Milling Co. Dec. 27, 1932. 36333/33.
 ALKALI SULPHIDES, manufacture.—Naamlooze Vennootschap Stukstofbindings-Industrie Nederland. Dec. 28, 1932. 36489/33.
 ORGANIC CARBOGEN COMPOUNDS and their application.—Grasselli Chemical Co. Dec. 29, 1932. 36656/33.
 PARASITICIDAL AND LIKE COMPOSITIONS, manufacture.—Grasselli Chemical Co. Dec. 29, 1932. 36658/33.
 DIOXAZINE COMPOUNDS, manufacture.—I. G. Farbenindustrie. Dec. 31, 1932. 80/34.
 REACTION PRODUCTS.—I. G. Farbenindustrie. March 2, 1932. 19137/34.

Specifications Accepted with Dates of Application

DRYING-OIL COMPOSITIONS, and polyhydric alcohol-polybasic acid resins prepared therewith.—American Cyanamid Co., and T. F. Bradley. Sept. 24, 1932. 412,558.

NITROGENOUS CONDENSATION PRODUCTS, manufacture and production.—J. Y. Johnson (I. G. Farbenindustrie). Dec. 28, 1932. 412,586.

FRACTIONAL DISTILLATION processes and apparatus.—Bakelite, Ltd. (Bakelite Corporation). Dec. 29, 1932. 412,594.

ADHESIVE MATERIALS from rubber latex, manufacture.—Imperial Chemical Industries, Ltd., H. M. Bunbury, R. B. F. F. Clarke and W. J. R. Evans. Jan. 5, 1933. 412,634.
 VULCANISATION OF RUBBER.—I. G. Farbenindustrie. Jan. 5, 1932. 412,635.

MAGNESIUM, continuous distillation.—Oesterreichisch Amerikanische Magnesit A.-G. Feb. 11, 1932. 412,664.

CELLULOSE ESTERS, manufacture or treatment.—British Celanese, Ltd. March 14, 1932. 412,710.

GLUCONIC ACID LACTONES, preparation.—Rohm and Haas Co. April 13, 1932. 412,723.

CONCENTRATED INDIARUBBER LATEX, production.—Dunlop Rubber Co., Ltd., D. F. Twiss and E. W. B. Owen. May 20, 1933. 412,752.

PRODUCTION OF PITCH by cracking coal tars.—C. Still (trading as C. Still (firm of)). June 30, 1932. 412,765.

FATTY ESTERS, process for manufacturing.—Proctor and Gamble Co. Aug. 22, 1932. 412,766.

CAUSTIC POTASH and oxalic acid, production.—R. Koepf and Co. Chemische Fabrik A.-G. July 9, 1932. 412,776.

CARBONIC ANHYDRIDE at low pressure, process and apparatus for storing and transporting.—H. Dehottay. Oct. 12, 1932. 412,814.

2-KETO-5-OXY- β -PERICYCLO-CAMPHANE from 2:5-diketo-camphane, process of manufacturing.—Zaidan Hojin Rikagaku Kenkyujo. May 9, 1933. 412,866.

Applications for Patents

June 21 to 27 (inclusive).

CHLORINATED NAPHTHALENES, production.—Imperial Chemical Industries, Ltd., and K. S. Jackson. 18555.

ORGANIC SILICON COMPOUNDS, production.—Imperial Chemical Industries, Ltd., J. P. Baxter and D. W. F. Hardie. 18759.

TEXTILE ASSISTANTS.—Imperial Chemical Industries, Ltd. 18760.

MATERIAL comprising a polyamide in sheet form, manufacture. Imperial Chemical Industries, Ltd., and H. J. Tattersall. 18967.

RESINOUS CONDENSATION PRODUCTS, manufacture.—J. Y. Johnson (I. G. Farbenindustrie). 18386.

AZO DYESTUFFS, manufacture.—J. Y. Johnson (I. G. Farbenindustrie). 18387, 18388.

COLOURING WATER-INSOLUBLE PLASTIC MASSES.—J. Y. Johnson (I. G. Farbenindustrie). (March 26.) 18705.

CHRYSENE DERIVATIVES, manufacture.—J. Y. Johnson (I. G. Farbenindustrie). 18996.

ORGANIC COMPOUNDS of high-molecular weight, production.—J. Y. Johnson (I. G. Farbenindustrie). 18997.

POTASSIUM NITRATE, production.—Kali-Forschungs-Anstalt Ges. (Germany, July 25, '33.) 18869.

PURIFYING NAPHTHALINE, ETC.—Soc. Industrielle des Carburants et Solvants. (France, June 24, '33.) 18611.

GUALACOL COMPOUNDS, production.—Syngala, Fabrik für Chemisch-Synthetische und Galenische Arzneimittel Ges. (Austria, June 28, '33.) 19019. (Austria, Feb. 21.) 19020.

June 28 to July 4 (inclusive).

WETTING, ETC., AGENTS, manufacture.—A. W. Baldwin, Imperial Chemical Industries, Ltd., and H. A. Piggott. 19127.

SULPHUR COMPOUNDS.—A. W. Baldwin, H. M. Bunbury, H. A. Piggott, and Imperial Chemical Industries, Ltd. 19128.

INTERMEDIATES FOR DYESTUFFS, manufacture.—A. W. Baldwin, Imperial Chemical Industries, Ltd., and A. H. Knight. 19130.

DERIVATIVES of unsaturated acids, manufacture.—R. Burns, Imperial Chemical Industries, Ltd., D. T. Jones and P. D. Ritchie. AZO DYESTUFFS, manufacture.—Deutsche Hydrierwerke. (Germany, June 28, '33.) 19142.

CELLULOSE DERIVATIVE COMPOSITIONS.—E. I. du Pont de Nemours and Co. (United States, July 15, '33.) 19126.

SIZING OF ABSORBENT MATERIALS.—E. I. du Pont de Nemours and Co. (United States, July 1, '33.) 19521.

WATER-IN-OIL EMULSIONS, manufacture.—E. I. du Pont de Nemours and Co. (United States, July 1, '33.) 19522.

AQUEOUS EMULSIONS, manufacture.—E. I. du Pont de Nemours and Co. (United States, July 1, '33.) 19523.

EMULSIFYING, wetting and detergent agents.—R. Greenhalgh, Imperial Chemical Industries, Ltd., and S. H. Oakeshott. 19516, 19517.

SAFETY-GLASS, manufacture.—W. W. Groves (Deutsche Celluloid-Fabrik). 19467.

CARBOXYLIC ACID ESTERS, manufacture.—W. W. Groves (Merrimac Chemical Co.). 19108.

SYNTHETIC DYESTUFFS.—N. H. Haddock, Imperial Chemical Industries, Ltd., and C. H. Lumsden. 19129.

GLYCERIDES OF FATTY ACIDS, manufacture.—T. P. Hilditch, J. G. Rigg and Imperial Chemical Industries, Ltd. 19518.

REACTION PRODUCTS, manufacture.—I. G. Farbenindustrie. (Germany, March 2, '32.) 19137.

POROUS FILTER BODIES, manufacture.—I. G. Farbenindustrie. (Germany, July 12, '33.) 18582. (Germany, Sept. 28, '33.) 19583.

ARYLAMINES, manufacture.—Imperial Chemical Industries, Ltd. and H. A. Piggott. 19311.

ORGANIC COMPOUNDS, manufacture.—Imperial Chemical Industries, Ltd., and M. Polyanyi. 19312.

SULPHUR COMPOUNDS, manufacture.—Imperial Chemical Industries, Ltd., and H. A. Piggott. 19313.

ALDEHYDES, manufacture.—J. Y. Johnson (I. G. Farbenindustrie). 19366.

COARSELY CRYSTALLINE AMMONIUM SULPHATE, production.—J. Y. Johnson (I. G. Farbenindustrie). 19464.

PHENOL-FORMALDEHYDE CONDENSATION PRODUCTS, manufacture. L. Nast, and J. C. Vredenburg. 19632.

TREATMENT OF ZINC OXIDE.—S. Percival (Grillo Handelsges). 19262.

MONOOXYCHRYSENE, manufacture.—Soc. of Chemical Industry in Basle. (Switzerland, June 30, '33.) 19107.

LAMP BLACK, production.—United Lamp Black Works, Ltd. (K. Hessler). 19621.

CARBON BISULPHIDE, extraction.—E. W. Yeoman. 19658.

New Companies Registered

Mitchell-Houston Co., Ltd.—Registered July 6. Nominal capital, £1,600. To acquire the business of a manufacturer of and dealer in water softeners of all kinds as formerly carried on by Harry P. Mitchell, as "Mitchell Houston Co.," at Windsor House, Victoria Street, S.W. Provisional directors: Richard G. Birmingham, 18 Victoria Street, London, S.W.1, Harry P. Mitchell.

The Irish Oil & Cake Mills, Ltd.—Registered in Dublin as a "public" company on July 4. Nominal capital £50,000. To carry on the business of manufacturing, refining, hardening, boiling, producing, importing and exporting, storing, distributing and marketing vegetable and mineral oils and their by-products, etc. Directors: Uneco J. Reinders, Nieuwe Haven, Zivolle, Holland, Willem Stubben, James J. Halpin, William H. Freeman, John V. McDaniel, Cecil P. Warham.

From Week to Week

AN INDEX TO VOLUME XXX OF THE CHEMICAL AGE is published with this issue. It will be found inside the back cover, whence it can readily be detached for binding purposes.

THE MERCERS' SIDE of the Gresham Committee have appointed Dr. J. Alison Glover to be Gresham Lecturer in Physics, in succession to Sir George Newman, who has resigned.

MR. WILLIAM PONTIN, who has retired after 22 years' service with Nobel's Explosives Co., Ltd., Ardeer Factory, Stevenston, was recently the recipient of a presentation from his colleagues.

ONE MAN WAS KILLED and five were seriously hurt when fire broke out at the cork factory at Washington, County Durham, chemical works on Wednesday. The dead man, Mr. Herbert Shaw, was assistant manager. He was injured by falling masonry, and died a few hours after admission to the infirmary.

THE WAR OFFICE ANNOUNCES that Dr. R. C. Bowden, Ph.D., M.Sc., M.I.Chem.E., F.I.C., F.C.S., chemical engineer under the Director of Ordnance Factories, has been appointed superintendent, Royal Gunpowder Factory, Waltham Abbey, in succession to Lieutenant-Colonel P. H. Evans, Royal Artillery, who retired on July 12.

DR. G. F. NEW, senior physicist and deputy director of the Paint Research Station at Teddington, has resigned to take up a commercial position at Billingham. There will be several staff changes at Teddington as a result. Dr. J. O. Cutter, senior chemist at the station, has been appointed second in command, with Dr. Hanstock as senior physicist. Mr. F. H. G. Pitt and Mr. R. R. Williams have been appointed junior physicists.

AT THE ROYAL SANITARY INSTITUTE EXHIBITION now being held at Bristol, the premier award of the Rogers Field Medal has been awarded to Imperial Chemical Industries, Ltd., for an exhibit of Chloros. The Rogers Field gold medal is awarded for an exhibit of pre-eminent merit from the point of view of hygiene, and added interest is lent to the award this year because of the importance which Chloros is likely to assume in view of the danger of contamination of water supplies arising from the long drought.

IN VIEW OF THE PUBLICITY given to the Press by Mr. Dvorkovitz, the directors of Motor Fuel Proprietary, Ltd., wish to announce that shortly after Mr. Stephenson joined the company it was decided to discontinue further research on the process covered by the Dvorkovitz patents, and entirely new patents were taken out. It is on these new patents that such satisfactory results have been obtained at Slough. The directors wish to reassure the shareholders that arrangements are being made to commercialise these patents.

APPLICATIONS FOR LICENCES under the Dyestuffs (Import Regulation) Acts, 1920 to 1934, during June totalled 733, of which 616 were from merchants or importers. To these should be added two cases outstanding on May 31, making a total of 735 for the month. The Dyestuffs Advisory Licensing Committee granted 726 licences and referred seven applications to British makers of similar products, leaving two cases outstanding on June 30. Of the total of 735 applications received, 729, or 99 per cent., were dealt with within seven days of receipt.

INTERNATIONAL COMBUSTION, LTD., announce that following the acquisition by British interests of all its shares hitherto held in America, a scheme of amalgamation of the company and its various subsidiaries has been sanctioned by an order of the court. Under this order the following subsidiary companies will become merged under the one organisation:—The Underfeed Stoker Co., Ltd.; Combustion Steam Generator, Ltd.; Mining and Industrial Equipment, Ltd.; Combustion Engineering, Ltd.; and the Detrick Arch Co., Ltd. Mr. G. R. T. Taylor (chairman), Mr. B. H. Binder, Mr. Noel H. Docker, and Mr. George C. Usher (managing director) remain on the board, and Lt.-Col. Sir Wyndham R. Portal, Mr. Frank Hodges and Mr. Leslie W. Farrow have been elected directors.

DETAILS HAVE BEEN CIRCULATED of an emergency organisation which Imperial Chemical Industries, Ltd., with the approval of the Ministry of Health, has set up to assist local authorities which may be experiencing difficulties with their supplies of drinking water. In many instances, owing to a shortage of the regular supply, water has to be obtained from other sources, the purity of which may be doubtful and below the usual standard. Such emergency supplies may, however, be rendered quite safe for domestic purposes provided they are first adequately treated and sterilised. Treatment with chlorine in some form is that generally employed, as it is efficient and comparatively simple in application, the four agents generally used being liquid chlorine, "chloros," chloramine and ordinary chloride of lime. Imperial Chemical Industries, Ltd., has accordingly posted a staff of experts trained in water sterilisation at its divisional offices in London, Newcastle, Manchester, Oldbury and Bristol, whose services will be at the disposal of any local authority desiring them for advice and assistance, which will be given free.

THE PRIVY COUNCIL, in pursuance of the Pharmacy and Poisons Act, 1933, has appointed Sir Erley Blackwell to be chairman of the statutory committee of the Pharmaceutical Society.

THE TELEPHONE NUMBER of the London head offices of Burroughs Wellcome & Co., is changed as from to-day (Saturday) from City 6000 to Central 4000.

THE IMPORT DUTIES ADVISORY COMMITTEE has received applications for the addition to the Free List of oxalic acid. Representations should be addressed in writing to the secretary, Import Duties Advisory Committee, Caxton House (West Block), Tothill Street, Westminster, London, S.W.1, not later than August 4.

ROBERT STEWART AND SONS, LTD., gum and chemical importers and exporters, 163 Fenchurch Street, E.C.3, have increased their nominal capital by the addition of £1,000 beyond the registered capital of £2,000. The additional capital is divided into 500 8 per cent. cumulative preference and 500 ordinary shares of £1 each.

THE SHALE DUMPS OF WEST LOTHIAN may be removed in time as the result of a new industry about to be started by Scottish Oils, Ltd. A brick works plant is being erected to make bricks from the spent shale. This material represents 80 per cent. of the shale mined. The plant is expected to begin production before the end of the year.

AT A MEETING of the Disciplinary Committee of the Law Society, constituted under the Solicitors Act, 1932, held in London on July 6, Arthur Ramsay Patey, formerly of Imperial Chemical House, Millbank, London, who was convicted at the Central Criminal Court in February, 1934, of obtaining money by false pretences and was sentenced to 18 months' imprisonment, was struck off the Roll.

THE WIDNES WORKS of Turner and Newall, Ltd., which already comprises forty acres and employs a record total of over a thousand operatives, will shortly be extended to include the land and premises formerly belonging to H. D. Pochin and Co., Ltd. Every branch of the factory is working to full capacity, and the completion of the extension recently sanctioned by the board is being urged forward so that full advantage can be taken of the present favourable conditions.

SCOTT BADER AND CO., LTD., announce that a new company has been formed, viz., Albert Products, Ltd., for the purpose of manufacturing the Albertol copals, Alftalates, Albertate, 100 per cent. phenolic resins, ester gums, etc., supplied in the past by Dr. Kurt Albert G.m.b.H., Wiesbaden-Biebrich. The works at Erith will enable the Albertol products to retain the position they hold in the field of synthetic resins. Scott Bader & Co., Ltd., will continue to act as sole concessionaires for the new company, for the United Kingdom and Ireland.

THE BRITISH COLOUR COUNCIL has now completed its dictionary of colour standards, by means of which, once for all, colours, whether in paint, textiles, or other material, are named, grouped, and numbered, so that those who order by name or number may be certain of getting the exact shade for which they asked. The task of reducing the colours to 220 must have required extraordinary patience as well as close eyesight, for, when the dyers and the textile industries were asked for samples of their wares the Council received, among others, 80 different sky-blues, 60 different whites, and 40 different blacks.

A PRELIMINARY AGREEMENT has been entered into between Thos. Firth and John Brown, Ltd., and the English Steel Corporation, Ltd., for the formation of a new company to acquire as from October 1, 1934, their respective businesses as producers of stainless and Staybrite steels. The agreement will require the consent of the debenture stockholders of Thos. Firth and John Brown, Ltd. The new company will be called Firth-Vickers Stainless Steels, Ltd., and Thos. Firth and John Brown, Ltd., and the English Steel Corporation, Ltd., will each hold one-half of the subscribed capital. The board of the new company will be appointed by the two parent companies, and Mr. A. J. Grant will be the first chairman. This arrangement is confined to stainless and Staybrite steels, and will not affect the other activities of the parent companies.

PRESIDING AT THE SIXTH ANNUAL MEETING of the Cellulose Acetate Silk Co., Ltd., at Lancaster, on Wednesday, Sir Donald Horsfall, chairman, said there was a substantially increased trading profit for the past year of £150,453. The net profit for the year was £97,174, representing net earnings of approximately 10 per cent. on the total issued capital. The productive capacity of the plant had been increased by more than 60 per cent. to meet the demand earlier in the year. The new duties still did not give adequate protection against foreign goods manufactured under unfair labour conditions, or against further depreciation of foreign currencies relative to sterling. The reduction of 6d. per lb. in Excise duty would inevitably cause serious losses on stocks, failing equitable compensation by the Government. It was, however, hoped that the reduced prices would eventually create demand.

British India Imports

Chemical Customs Tariff and Valuations

THE "Board of Trade Journal" for June 28, contains a reprint of the Customs Tariff for British India, in which the following items are of interest to the chemical and allied industries:—

Names of Articles.	Tariff Values.	Standard Rate of Duty.	Preferential Rate of Duty for the United Kingdom.	Names of Articles.	Tariff Values.	Standard Rate of Duty.	Preferential Rate of Duty for the United Kingdom.
<p>Barks for tanning Free</p> <p>GUMS, RESINS AND LAC.</p> <p>Stick or Seed Lac Free</p> <p>Gums, Arabic, Benjamin (ras and cowrie) and Dammer (including unrefined bats) and rosin <i>ad val.</i> 30%</p> <p>Tariff values:—</p> <p>Dammer batu, unrefined ... per cwt. 5 8 0</p> <p>Gum Arabic, other than ground ... 21 0 0</p> <p>Gum Benjamin, ras ... 22 0 0</p> <p>Gum Benjamin, cowrie ... 51 0 0</p> <p>Gum Dammer (or Copal) ... 23 2 0</p> <p>Rosin ... 8 8 0</p> <p>Gums, Resins and Lac, all sorts not otherwise specified <i>ad val.</i> 25%</p> <p>Tariff values:—</p> <p>Gum Ammoniac ... per cwt. 28 0 0</p> <p>Gum Bysabol (coarse myrrh) ... 19 4 0</p> <p>Gum olibanum or frankincense ... 10 12 0</p> <p>Gum, Persian (false) ... 10 5 0</p> <p>Myrrh ... 19 12 0</p>							
<p>ESSENTIAL OILS AND VEGETABLE OILS.</p> <p>Natural Essential Oils of citronella, cinnamon and cinnamon leaf <i>ad val.</i> 30% 20%</p> <p>Tariff value:—</p> <p>Citronella oil, natural, from Ceylon, Straits, China, Japan and the Far East per lb. 1 5 0</p> <p>Natural Essential Oils, all sorts not otherwise specified <i>ad val.</i> 30% 20%</p> <p>Tariff value:—</p> <p>Cassia oil, natural, from Ceylon, Straits, China, Japan and the Far East per lb. 0 14 6</p> <p>Essential Oils, synthetic <i>ad val.</i> 30% 20%</p> <p>Vegetable Non-essential Oils of coconut, groundnut and linseed* <i>ad val.</i> 35%</p> <p>Tariff values:—</p> <p>Coconut oil ... per cwt. 12 8 0</p> <p>Linseed oil, raw or boiled per imp. gallon 2 2 0</p> <p>Vegetable Non-essential Oils not otherwise specified <i>ad val.</i> 35% 25%</p> <p>OIL SEEDS.</p> <p>Oil-seeds imported into British India by sea from the territories of any Prince or Chief in India Free</p> <p>Oil-seeds, non-essential, all sorts not otherwise specified, including copra or coconut kernel† <i>ad val.</i> 30%</p> <p>Tariff value:—</p> <p>Copra or coconut kernel ... per cwt. 9 0 0</p> <p>TALLOW, STEARINE AND WAX.</p> <p>Beeswax <i>ad val.</i> 30%</p> <p>Tallow Free</p> <p>All sorts of stearine, wax, grease and animal fat not otherwise specified <i>ad val.</i> 25%</p> <p>Tariff values:—</p> <p>Lubricating grease ... per lb. 0 3 6</p> <p>Petroleum jelly, white ... 0 6 0</p> <p>Petroleum jelly, all other sorts ... 0 2 6</p> <p>CHEMICALS, DRUGS AND MEDICINES.</p> <p>Bleaching Paste and bleaching powder Free</p> <p>Camphor <i>ad val.</i> 50%</p> <p>Tariff values:—</p> <p>Camphor, refined, other than powder per lb. 1 8 0</p> <p>Camphor, powder, other than synthetic ... 1 6 0</p> <p>Camphor, synthetic, tablets and slabs ... 1 6 0</p> <p>Camphor, synthetic, powder ... 1 0 0</p> <p>Coppers, green (ferrous sulphate) <i>ad val.</i> 2½%</p> <p>Opium and its alkaloids and their derivatives per seer of 80 tolas Rs. 30 or 18½% <i>ad val.</i></p> <p>Cinchona Bark and the alkaloids extracted therefrom, including quinine and alkaloids derived from other sources which are chemically identical with alkaloids extracted from cinchona bark Free</p> <p>Heavy Chemicals:—</p> <p>(1) Alum (ammonia alum, potash alum and soda alum) <i>ad val.</i> 25% or Re. 1-6 per cwt.</p> <p>(2) Magnesium sulphate or hydrated magnesium sulphate <i>ad val.</i> 25% or Re. 1-4 per cwt.</p> <p>Heavy Chemicals:—</p> <p>Magnesium chloride ... per cwt. — Re. 1-5 or 25% <i>ad val.</i></p> <p>Sulphur Free</p> <p>Cadmium sulphide, cobalt oxide, selenium, uranium oxide and zinc oxide <i>ad val.</i> 25% 15%</p> <p>Acetic, carbonic, citric and oxalic acids, naphthalene, potassium chlorate and potassium cyanide, bicarbonate of soda, borax, sodium silicate, arsenic, calcium carbide, glycerine, lead, magnesium and zinc compounds not otherwise specified, aloes, asafetida, cocaine, sarsaparilla, and storax <i>ad val.</i> 25%</p> <p>Tariff values:—</p> <p>Acetic acid ... per lb. 0 5 0</p> <p>Arsenic (China mansil) ... per cwt. 45 0 0</p>							
<p>Borax, granular, powdered or crystalline (in bulk) per cwt. 10 0 0</p> <p>Calcium carbide 14 0 0</p> <p>Chlorate of potash 23 0 0</p> <p>Glycerine 32 8 0</p> <p>Naphthalene balls 11 4 0</p> <p>Oxalic acid 32 8 0</p> <p>Sodium bicarbonate 7 6 0</p> <p>Sodium silicate (in liquid form) 7 10 0</p> <p>Chemicals, drugs and medicines, all sorts not otherwise specified‡ <i>ad val.</i> 30% 20%</p> <p>Tariff values:—</p> <p>Alkali, Indian (sajji-khar) ... per cwt. 2 6 6</p> <p>Ammonia gas, anhydrous, including compressed or liquefied gas ... per lb. 0 9 0</p> <p>Ammonium carbonate or bicarbonate ... per cwt. 21 0 0</p> <p>Ammonium chloride:—</p> <p>Muriate of ammonia, crystalline ... 12 8 0</p> <p>Salammoniac, sublimed ... 25 0 0</p> <p>Other sorts, including compressed ... 18 0 0</p> <p>Boric acid (in bulk) ... 14 0 0</p> <p>Calcium chloride ... 4 6 0</p> <p>Carbonic acid gas, including compressed or liquefied gas ... per lb. 0 5 0</p> <p>Chloride of potash ... per cwt. 26 0 0</p> <p>Chlorine ... per lb. 0 5 0</p> <p>Copper sulphate ... per cwt. 13 4 0</p> <p>Menthol (peppermint) crystals per oz. 9 6 0</p> <p>Potassium bichromate ... per cwt. 33 0 0</p> <p>Soda ash, including calcined natural soda and manufactured sesqui-carbonates ... per cwt. 5 8 0</p> <p>Soda, caustic, flake ... 13 10 0</p> <p>Soda, caustic, powdered ... 14 4 0</p> <p>Soda, caustic, solid ... 10 12 0</p> <p>Soda crystals ... 6 8 0</p> <p>Sodium dichromate ... 26 8 0</p> <p>Sodium hydrosulphite ... 48 0 0</p> <p>Sodium hyposulphite (in bulk) ... 10 2 0</p> <p>Sodium sulphide ... 6 8 0</p> <p>Tartaric acid in kegs or in bulk ... 65 0 0</p> <p>Trona or natural soda uncalcined ... 4 0 0</p> <p>DYES AND COLOURS.</p> <p>Cutch and Gambier, all sorts <i>ad val.</i> 30%</p> <p>Tariff values:—</p> <p>Gambier, block and cube ... per cwt. 13 0 0</p> <p>Gambier in flakes or circular pieces ... 38 0 0</p> <p>Dyes derived from coal-tar and coal-tar derivatives, used in any dyeing process <i>ad val.</i> 10%</p> <p>Tariff values:—</p> <p>Alizarine, moist:—</p> <p>(a) Not exceeding 16 per cent. per cwt. 65 0 0</p> <p>(b) Over 16 per cent., not exceeding 20 per cent. ... per cwt. 80 0 0</p> <p>(c) Exceeding 20 per cent. ... 160 0 0</p> <p>Alizarine, dry:—</p> <p>(a) Not exceeding 40 per cent. per lb. 1 13 0</p> <p>(b) Exceeding 40 per cent. ... 3 10 0</p> <p>Congo red ... 10 6 0</p> <p>Coupling dyes of the naphthol group:—</p> <p>(a) Naphthols ... 5 0 0</p> <p>(b) Rapid fast colours (rapid salts) ... 8 0 0</p> <p>(c) Bases ... 4 0 0</p> <p>(d) Other salts ... 2 1 0</p> <p>Vats:—</p> <p>(a) Indigo ... 1 8 0</p> <p>(b) Carbazole blue ... 3 13 0</p> <p>(c) Other sorts:—</p> <p>(i) Paste ... 3 4 0</p> <p>(ii) Powder ... 15 0 0</p> <p>Sulphur black ... 0 7 0</p> <p>Metanil yellow ... 1 2 0</p> <p>Auramine of concentration of 15 per cent. or less ... per lb. 0 12 6</p> <p>Rhodamine of concentration of 15 per cent. or less (Carthamines) ... per lb. 0 12 6</p> <p>Aniline salts ... 0 6 6</p> <p>All others ... 1 12 0</p> <p>Dyeing and Tanning Substances, all sorts not otherwise specified <i>ad val.</i> 25%</p> <p>Tariff values:—</p> <p>Cochineal ... per lb. 0 15 6</p> <p>Gallnuts, Persian ... per cwt. 46 0 0</p> <p>Paints, colours and painters' materials:—</p> <p>Red lead, genuine dry, genuine moist and reduced moist ... <i>ad val.</i> 30% or Rs. 4-12 per cwt.</p> <p>White lead, genuine dry ... <i>ad val.</i> 30% or Rs. 5-12 per cwt.</p> <p>Zinc white, genuine dry ... <i>ad val.</i> 30% or Rs. 6 per cwt.</p> <p>Red lead, reduced, dry ... <i>ad val.</i> 25% or Rs. 4-12 per cwt.</p> <p>White lead, genuine, moist and reduced, dry or moist ... <i>ad val.</i> 25% or Rs. 5-12 per cwt.</p>							

* Under Government of India, Finance Department (Central Revenues) Notification No. 14, dated April 9, 1932, as amended subsequently, the duty leviable on linseed oil at the standard rate is 25 per cent. *ad valorem*.

† Under Government of India, Finance Department (Central Revenues) Notification No. 14, dated April 9, 1932, tung oil seeds are exempt from payment of import duty for a period of three years from October 17, 1931.

‡ Under Government of India, Finance Department (Central Revenues) Notification No. 14, dated April 9, 1932, calcium acetate and radium salts are exempt from payment of import duty.

Zinc white, genuine, moist	ad val.	25% or Rs. 8 per cwt.	—
Zinc white, reduced, dry or moist	ad val.	25% or Rs. 4.4 per cwt.	—
The following paints, colours and painters' materials, namely, barytes, turpentine, turpentine substitute, and varnish not containing dangerous petroleum within the meaning of the Indian Petroleum Act, 1899			
Plumbago and Graphite	ad val.	25%	—
Paints, Colours and Painters' Materials, all sorts not otherwise specified, including paints, solutions and compositions containing dangerous petroleum within the meaning of the Indian Petroleum Act, 1899	ad val.	30%	20%
Tariff values			
Gamboge	per lb.	1 0 0	
Vermilion from China	"	2 4 0	

French Import Quotas

List of Renewals

THE French "Journal Officiel" of July 1 contains a series of Orders dated June 30, fixing the quotas for the import of a number of industrial products into France during the period July 1 to September 30. We publish below particulars of those quotas in respect of which the allocation among the various supplying countries is announced, showing in each case the total quota for the quarter and the portion allotted to the United Kingdom, or, where the United Kingdom does not receive a separate share, the portion allotted to "other countries" in which the United Kingdom participates.

		Kg. (net weight).
Tariff No. 055—Crude iodine ... ..	.. ..	308
Share for "other" countries, including United Kingdom	Nil
Tariff No. 056—Refined iodine—all from Germany	300

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'Phone 1 Regent 6611

Tariff No. 057—Iodides of ammonium, lithium, potassium, sodium and strontium	109
Share for countries other than Japan ... ..	.. ..	66
Quintals.		
Tariff No. 073—Commercially pure acid ... ..	.. ..	316
Share for "other" countries, including United Kingdom ... ..	.. ..	20
Acid not commercially pure ... ..	.. ..	54,672
Share for "other" countries, including United Kingdom ... ..	.. ..	11
Quintals.		
Tariff No. 179—China clay ... ..	.. ..	152,731
United Kingdom share ... ..	.. ..	120,000
United Kingdom china clay may only be imported if accompanied by a certificate from the "Federation des syndicats des produits chimiques, engrais et produits connexes, 11, rue Portalis, Paris," to which applications should be addressed before July 31. Quantities of china clay may be admitted in excess of the quotas fixed if recognised as necessary for the national economy.		
Quintals.		
Tariff No. 325—Glue made from bones, sinews, skin, etc., in slabs, sheets, or powder, liquid, in jelly or in paste ... ..	.. ..	2,957
United Kingdom share ... ..	.. ..	482
As hitherto, United Kingdom glue will only be admitted if accompanied by certificates issued by the Federation of Bone Users and Allied Trades, Ltd., Central House, 45, Kingsway, London, W.C.2.		
Tariff No. 0377—Sumach, chestnut and other vegetable tanning extracts, solid or liquid ... ..	.. ..	2,794
United Kingdom share ... ..	.. ..	319
The above goods may only be imported under licences issued by the Customs on the advice of the "Office des produits chimiques et pharmaceutiques, 101, rue de Grenelle, Paris," to which applications should be addressed by August 1.		
Quintals.		
Tariff No. 060—Peroxide of hydrogen ... ..	.. ..	1,302
Share for "other" countries, including United Kingdom ... ..	.. ..	1
Metric tons.		
Tariff No. 036—Carbon bisulphide—from Belgium, Germany and Italy only ... ..	.. ..	337
As hitherto, imports are subject to licence.		

Books Received

The Electronic Structure and Properties of Matter. By C. H. Douglas Clark. London: Chapman and Hall. Pp. 373. 21s.

FOR SALE

(1s. per line; minimum charge 5s. Sixpence extra is charged when replies are addressed to Box Numbers.)

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C IRCULAR type Horizontal Dryer with Agitator, also Gas Heated Drying Machine with brass internal fittings and revolving agitators. Box No. 1604, THE CHEMICAL AGE, 154 Fleet Street, London, E.C.4.

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

HYDRAULIC PRESSES AND PUMPS. Large stock in London. Price quoted for adapting and erecting.—THOMPSON AND SON, Maria Street, Millwall.

HORIZONTAL Cone Grinding Mill, with Fast and Loose Pulleys, by Follows and Bate. In good working order. Box No. 1614, THE CHEMICAL AGE, 154 Fleet Street, E.C.4.