

them have to be taken into account in determining the two-thirds majority, so that a small group of dissentient votes may suffice to prevent a resolution being carried; or, as in the present case, a unanimous vote of those present may be insufficient to obtain the necessary majority. The serious inconvenience of this state of things was emphasised by several of the delegates at the present meeting, and the Executive Committee was requested to consider the situation, which must increase in difficulty as the membership of the Council is more widely spread over the world, with the view of suggesting a remedy.

The Council was not in favour of a proposal to rescind a resolution adopted at the meeting in 1922 requiring a country to join the Research Council before becoming a member of a Union.

A Committee which had been nominated provisionally by the Executive Committee in order to study the relations between solar and terrestrial phenomena was formally appointed by the Council for a period of three years, with power to add to its membership. The Committee will enter into communication with scientific men who are interested in the subjects to be studied by the Committee, especially those of countries which are not represented on the Committee. The

constitution of the Committee is: Prof. S. Chapman (chairman), Prof. G. Abbetti, Dr. C. G. Abbot, Dr. C. Chree, M. H. Deslandres, General G. Ferrié, Dr. C. E. St. John, Dr. G. C. Simpson, and Prof. C. Störmer. The Committee held several meetings at Brussels on the present occasion. The Council had also before it a proposal from the International Mathematical Union advocating intimate co-operation between the Union and the Committee of Intellectual Co-operation of the League of Nations. As probably affecting other Unions also, the proposal was referred to the Executive Committee of the Council for consideration and report.

The period for which the president of the Council, M. E. Picard, had been elected having come to an end, his re-election was proposed by Prof. Lorentz and was unanimously agreed to. Dr. G. E. Hale and M. Lecoqte being unable for reasons of health to serve on the Executive Committee, Dr. V. Kellogg and M. P. Pelseneer were elected to fill these vacancies.

The Union of Pure and Applied Physics, and that of the Biological Sciences, held meetings at Brussels during those of the Research Council. In the Union of Physics the desirability of full internationality being attained at the earliest possible date was urged, and a resolution to this effect was passed unanimously.

Industrial Chemistry at Wembley.

THE visitor to the British Empire Exhibition who takes it *au sérieux* will find a plethora of good things to stimulate his mind, and if his bent is towards science or its applications he will revel in the exhibits of the Government Pavilion and in many of the attractions of the Palace of Industry. In the latter the signs and portents of chemical enterprise should convince him that the days of "dogmatic slumber" are fast disappearing, and that although British chemical industry cannot compare in magnitude with such industries as engineering, mining, shipping, and textiles, they are nevertheless of equal fundamental importance. As in 1924, the chemical exhibits have been organised by the Association of British Chemical Manufacturers, and the same commanding position in the Palace of Industry has been utilised.

Comparing the chemical section with that of last year, the visitor will notice the same excellent lay-out, though he may regret the absence of exhibits from a number of well-known manufacturers. This absence does not, however, seriously impair interest, and in some ways is an advantage, because undue multiplication of similar exhibits is avoided, and there is more space available for effective display. On the other hand, the presence of rather an excessive number of vendors of "cures," perfumes, hair-washes, and other proprietary toilet articles is apt to confirm the man in the street in his prepossession that chemistry begins and ends with pharmacy. Another noticeable absence, both this year and last year, is that of chemical exhibits from the Dominions Overseas. Nowhere in the Exhibition do we find any tangible evidence that our sister nations are striving to realise their war-time aspirations of industrial independence and of security against physical aggression through the medium of a well-organised and effective chemical industry.

Although many of the exhibits are the same as those shown last year, there are a number of interesting

novelties. The exhibit of Messrs. Burroughs Wellcome and Co. is a model of clear and attractive presentation, and its educational value is very high. Not only are medicinal and photographic chemicals displayed in artistic form and, where possible, in logical array, but concise information is also given concerning raw materials, methods of extraction, and preparation by synthetic methods; manufacturing operations are outlined, intermediate products are described, and miniature models of apparatus are exhibited. To attract the public there are crystals of various substances illuminated by coloured lights; and there is a very interesting display of historical relics—medicine-chests and first-aid outfits—carried by famous explorers, as well as dioramic views of the scenes of their activities.

Acids, alkalis, and other main products of the heavy chemical industry are so familiar that it must be difficult to devise new modes of display. Messrs. Brunner, Mond and Co., with their associated firms, have overcome this difficulty, partly by means of an attractive setting, and partly by exhibiting some up-to-date applications of well-known substances. Thus a number of new uses have been found for sodium silicate (of various composition), which has long been used in large quantities as a filling for soap (though it is said to have a slight detergent action). When mixed with powdered limestone it is now successfully used for hardening the concrete surfaces of roads, and the soft porous chalky limestone, which has hitherto been found useless for road-construction, has now found a valuable application. The mixture is sprinkled on to the prepared surface and then worked in with a soft broom. Three coats are applied, and the surface of calcium silicate so produced is more durable and more free from dust than surfaces made with the aid of coal-tar. Messrs. Brunner, Mond and Co. are also showing specimens of "grey pressed bricks," made of calcium silicate, which, though relatively heavy, are stronger and much less

pervious to water than common bricks, whilst their prepared surface renders unnecessary the use of plaster. Sodium silicate is coming into use as a means of preventing corrosion of water-pipes and cisterns, and of enabling aluminium utensils to withstand the action of hot solutions of soda. It is also used as an adhesive. Calcium chloride, a heavy chemical which for long awaited an adequate market, is used, *inter alia*, for spraying rubble tennis-courts to prevent the rising of dust.

The firm, Synthetic Ammonia and Nitrates, Ltd., shows a small case containing specimens of the products made in the nitrogen factory at Billingham-on-Tees. These consist of calcium nitrate, sodium nitrite, ammonium nitrate (not yet marketed), ammonium sulphate, and "agricultural chalk," which is calcium carbonate containing two per cent. of ammonium sulphate. In view of the enormous potential importance of this industry, the exhibit is disappointing. The mere display of products, most of them very familiar, gives the public no idea of the nature of the nitrogen problem and how chemists in all civilised countries are trying to solve it; and it should be possible to give the student and the technical man satisfying information without disclosing vital secrets of manufacture.

An interesting feature of the Brunner-Mond display is a continuous automatic-lantern exhibition depicting bird's-eye views of factories, the loading and unloading of goods, methods of transport, offices, etc., connected with this firm's world-wide activities. Messrs. Chance and Hunt, Ltd., are showing, in addition to their staple products, specimens of ferrous chloride, which is now used in making jointless magnesite flooring. The Castner-Kellner Alkali Co. has a small exhibit relating to the use of liquid chlorine and of chlorine derivatives of ethane and ethylene, bleaching agents, etc., whilst Electro-Bleach and By-products, Ltd., makes a special point of its sesquicarbonate of soda, which is a very concentrated form of soda for cleaning and other purposes.

Messrs. Albright and Wilson, Ltd., well known for their manufactures of phosphorus, show interesting exhibits relating to the fire-proofing of wood and the preservation of stone. By means of the "Oxylene" (secret) process, owned by the Timber Fire-proofing Co., Ltd., of Market Bosworth, wooden safes and their contents can now be protected from the effects of exposure to high temperatures. A deal fire-proof door is shown, one side of which became covered with adherent non-conducting charcoal on exposure to flames at a temperature above 900° C., whilst the other side barely became hot. The merits of Prof. A. P. Laurie's "silicon ester" as a means of preventing decay of building-stone are effectively indicated by specimens of treated and untreated materials. "Silicon ester" is made by the interaction of alcohol and silicon tetrachloride, and it acts by depositing silica in the pores of the stone, thereby strengthening it but not affecting its permeability. One of the chief attractions in the stand of the United Alkali Co. is an educational exhibit of "intermediates" derived from coal-tar, so executed as to bring out their genetic relationships. The Salt Union, Ltd., shows that it is moving with the times by displaying a table-salt which, as the name

"Salodine" suggests, contains an iodine compound; and the British Cyanide Co., Ltd., exhibits a new colourless and odourless synthetic resin, made from thiourea, which is well adapted for making insulating materials and moulded articles like cups and saucers.

This year the dyestuff-makers have largely discarded strictly technical exhibits, and have co-operated in presenting artistic displays and colour schemes. Instead of being met with the usual array of bottled products, the eye is at once attracted by two large tents, with revolving tops, and a long corridor, all draped with coloured fabrics. Around are displayed articles, from carpets to candles, coloured with British dyes. Fine chemicals are well represented by Messrs. A. Boake Roberts and Co., the Graesser-Monsanto Chemical Works, Ltd., the Clayton Aniline Co., Ltd., Thomas Tyrer and Co., Ltd., B. Laporte, Ltd., and a number of others. In the exhibit of the first-named there is a good model of a three-column distilling plant by Messrs. Blair, Campbell and McLean.

Our two largest gas companies are, as usual, to the fore with luxurious displays, and there is an attractive co-operative exhibit by tar-makers of a rustic scene with an inn, garden, bridge, a tree with mechanical singing-birds, and a country road made up with "Tarmac." Unfortunately, the recent report of the Standing Committee on Rivers Pollution has severely condemned the use of tar on roads, because the washings are toxic to fish, particularly when the road surface is broken up, and it enjoins the use of bitumen instead. By way of counterblast there is shown in the scientific section a shallow tank containing live fish and plants supplied by water running over channels prepared with "specially refined" tar. Although the conditions in the tank are scarcely comparable with those in a stream, the exhibit is ingenious and attractive to the passer-by.

The scientific section is hidden away in the midst of the industrial chemistry exhibit. Its position may perhaps be justified as indicating that scientific research is the "heart" of chemical industry. The exhibit this year is devoted to educational exhibits relating to coal, salt, and food. The coal exhibit is the most comprehensive, containing excellent models of plant, but all are good. A small exhibit illustrating the properties, etc., of viscose and cellulose "silks," and that of some products obtained in the "Berginisation" of coal, increase the interest of this valuable section.

In the above account it has not been possible to mention more than a few of the exhibits, but there are many more of a high order. Those who are responsible for the success achieved during the two sessions will doubtless use the experience gained to do even better in the future. The tendency, already shown, to find substitutes for "bottled" products should be encouraged; there should be more models of plant and apparatus, and—what is entirely lacking in the present exhibition—economic information conveyed in the form of charts and diagrams. Those who stand for science in industry appreciate the fine efforts which so many chemical manufacturers have made in connexion with this exhibition; they would be even more appreciative if their thirst for knowledge could be assuaged by conversation with a few technical men who might be specially detailed to explain or demonstrate the processes and products displayed.