

determinations of the declinations of the stars involved in this work was also strongly urged.

A research survey for all the minor planets, giving a record of available fundamental investigations on the perturbations of minor planets, was approved by the Union on the suggestion of Prof. Leuschner.

Observatories with suitable instruments were asked to arrange to secure annually photographs of the meteors of the three annual showers, the Perseids, Orionids and Geminids.

Welcome news was given by Prof. Turner as to the progress of the *Carte du Ciel*. France and Italy hope to complete their zones in eight years' time or sooner. The chief delays are at Tacubaya and Sydney, and the Union appealed to the two governments concerned for more rapid prosecution of the work.

In parallax work it was recommended that observers of trigonometric parallaxes should shape their programme, so far as possible, to meet the needs for spectroscopic and dynamical determinations. Faint stars of large proper motion are especially important. It was also agreed that photometric observers should be urged to determine carefully the magnitudes and colour equivalents of these stars.

Prof. von Zeipel reported through the Committee on Photometry that at Upsala it is proposed to determine the photographic and photovisual magnitudes of the 11,700 stars in the A.G. catalogue between $+35^\circ$ and $+40^\circ$.

A grant of 6000 francs was made to Dr. Aitken at the Lick Observatory for the clerical work of the Double Star Bureau, in connexion with the extension of Burnham's General Catalogue. The use of the reversing prism in determining position angle in double stars was also approved.

During the meeting co-operative work on the important Cepheid variables was arranged. As to notation, the Union supported that of Chambers—André—Nijland. A list of variable stars needing special attention, drawn up by Prof. Nijland, was published in the report of the Committee on Variable Stars.

It was agreed that a new catalogue of the brighter and larger nebulae should be drawn up, illustrated by plates and including globular clusters. The system to be adopted for classification is to be purely descriptive. It was also recommended that in published work on nebulae the N.G.C. or I.C. number should always be used, and that steps be taken to divide the sky into zones allotted to different observatories for work on agreed lines on nebulae. It was also agreed that observatories should be encouraged to publish, whenever possible, copies of their best spectrograms.

This would be of assistance for the next stage in stellar spectral classification. A small catalogue of some 20 to 25 stars is to be prepared to serve as standards in radial velocity work.

Important resolutions were adopted amending the forms, times and modes of emission of radio time signals. For the international time system at certain times it was agreed to replace the present three dashes by six dots.

The above brief summary of the more interesting resolutions indicates that a large volume of work was got through in the various committees. In addition, much valuable material is incorporated in many of the reports of the committees, especially in the accounts of recent work. It is to be hoped that the volume of proceedings may shortly be available to the public. The reports of the committees were for the most part taken without discussion at the general assembly in its closing meetings, the one fight being over the question of the hour of commencement of the Julian day. By a large majority it was agreed that this should remain at noon. The failure of the International Research Council at its recent meeting at Brussels to make any change in the statutes governing the conditions of national adherence led to a number of statements being made by the various national delegations. The United States, Italy, Japan, Spain, Denmark, Sweden, and Canada urged that all restrictions should be removed, while Belgium, France, Poland, Czecho-Slovakia, Portugal, and Rumania contented themselves with asking the International Research Council not to block the admission of the Central Powers when they became members of the League of Nations.

The next meeting of the Union was arranged, on the invitation of the Dutch government, to take place in Holland in 1928. The committees of the Union were appointed for the next three years, including new committees on stellar statistics and on solar parallax. Officers of the Union for the next three years were elected as follows:—Prof. De Sitter (president); Profs. Cerulli, Deslandres, Hirayama, Eddington, and Schlesinger (vice-presidents); Lieut.-Col. Stratton (general secretary).

A very successful meeting closed on July 22. Generous hospitality was shown throughout by the Colleges. Amongst many interesting points referred to in the side meetings was an announcement that Prof. Adams has measured the Einstein shift in the spectrum of the companion to Sirius. The result is consistent with the theoretical view already announced, that this star, though 2000 times as dense as platinum, obeys the gas laws.

The Field Museum of Natural History, Chicago.

THOSE connected with museums in Great Britain generally read the annual reports of museums in the United States with some envy. This is partly because those reports are produced in a style to interest the reader and to do credit to their institutions, partly because of the vigorous work they reveal. The chief factors, no doubt, are brains and enthusiasm, but these cannot operate without the other factor—sufficient funds. The report of the Field Museum of Natural History, Chicago, for 1924, which is just to hand, illustrates these points. It consists of 115 pages, of which half give a readable account of progress, and it is illustrated by 16 photogravure plates prepared in the Museum, as are all the Museum publications. That is how it is possible for the volume to bear the date January 1925.

The Field Museum corresponds to our own Natural

History Museum plus a department of anthropology. Its scientific staff, exclusive of the Director, numbers only twenty, but its expenditure last year was about 117,370*l.* The expenditure of our Natural History Museum for last year was about 97,925*l.*, and the scientific staff numbers forty-three permanent and thirteen temporary members.

The extension work of the Field Museum in public schools, the reproduction of living plants in models, and the pensions to employees are provided for by separate funds. Setting those activities aside, one notes that about 5000*l.* was spent during the year on expeditions; then there are three guide-lecturers, who, besides conducting visitors, give regular lectures illustrated by lantern and cinematograph; the printing has already been mentioned, but it should be added that this includes a large number of coloured posters

and advertisement folders. Such are a few of the lines of work in which British museums of similar size and character cannot compete. This expenditure, however, cannot be regarded as wholly unproductive, for it must certainly attract a large number of subscribing members. In Great Britain most museums are maintained by compulsory imposts, and free gifts of money are harder to come by. Whatever may be the relative advantages or disadvantages, it is certainly creditable to the citizens of the United States that they support so many admirable museums by private generosity.

From the body of the report a few items may be selected as continuing the contrast. Leakage through the roof of the top-lighted halls has been remedied in drastic fashion by coating the 38,500 square feet of skylights with a double thickness of Celotex overlaid with Ruberoid roofing. This has involved a change in the lighting of the halls from daylight to electric light. Making a virtue of necessity, it is claimed that artificial lighting is more suitable for the exhibited material because the illumination is more uniform and avoids the fading effects of sunlight. Since many American museums have long surpassed those in Britain in the use of electric light, we may be sure that some of the "dazzle headlight" effect recently introduced into one of our largest metropolitan museums has been avoided; but we are not so sure about the fading.

A somewhat full account is given of the re-erection of two Mastaba tombs from Egypt. The blocks arrived in 206 cases weighing 96 tons. The lower courses and missing stones have been replaced by cement blocks. The stones are bedded in lead, joined by dowels and metal clamps, and each secured to a bracketed upright steel channel. The ceiling has been raised 18 in. above the walls, and hidden lights are in a trough on the top of the wall. Every

care has been taken to prevent humidity, and the room at the back of the tombs is mechanically ventilated. These and other details are given in the report "in the hope that the information may prove useful to other institutions." The use of terms unfamiliar, at least in Great Britain, and the absence of illustrations will, it is to be feared, frustrate this hope.

A poisoning and storage room, apparently in five sections, for the preservation of perishable material, has been constructed of compressed steel and equipped with storage bins of cedar wood. Formaldehyde candles have been used for poisoning with good success.

Many British provincial museums have long experienced the popularity of a wild flower exhibit, but none of them has attempted to show living and growing wild plants on anything like the scale attempted last year in the Field Museum. The case was a kind of large flower-box, and soon proved so successful that it was replaced by one four times the size, permitting of an approximately ecological grouping, which ranged from sand-dune plants to water plants. During the season about 500 species were shown, with full labels and guide leaflets.

Though not of such interest to the public, the numerous paragraphs revealing what careful attention is paid to storage, unpacking, sorting, and general office equipment will be read with appreciation by all museum curators. Nothing is more difficult to impress upon governors, committees, architects, and providers of funds than the fact that the life of a museum is in its workrooms and workshops, and that in any plans for development the first attention should always be paid to those unseen but indispensable offices. What is a banqueting hall without its kitchen? We can better dispense with the toast-master than with the cook.

F. A. BATHER.

The Sixth International Conference of Pure and Applied Chemistry.

SOME seventy foreign delegates, representing twenty different countries, attended the conference which was held recently in Bucharest. The decoration of railway stations and of public buildings and the more than generous hospitality provided by private individuals, public officials and organisations throughout the duration of the conference, indicated how important the event was considered in Roumania, and demonstrated the sympathetic attitude of its people towards chemistry.

The actual business of the conference was transacted on June 22 - June 25 under the presidency of Sir William Pope, and the other British delegates were Prof. J. C. Drummond and Prof. C. S. Gibson. The prestige of British chemistry can scarcely be said to have been adequately maintained since Denmark, the United States, Spain, France and Italy were each represented by a larger number of delegates than Great Britain. At the opening official reception, H.R.H. the Crown Prince of Roumania was present and, later, representative delegates were entertained by their Majesties the King and Queen at the Royal Palace at Sinaia.

Apart from the work of the special committees which met in the mornings and afternoons, a discussion on "The Nitrogen Problem," in which Prof. F. Giordani of Naples and Prof. D. Staehelin of Bucharest took part, was of special interest in connexion with the natural resources of Roumania. Public lectures were also delivered by Prof. Charles Moureu and Prof. Ernest Fourné on "Autoxidation and Catalytic Phenomena" and "The Relationships between the Chemical Constitution of Substances and their Physiological Properties" respectively.

At the closing meeting, Prof. Ernst Cohen of Utrecht was unanimously elected president of the Conference in succession to Sir William Pope, who, like his predecessor, Prof. Moureu, has held this important office during three years. Mr. Jean Gérard was re-elected secretary and the following were appointed vice-presidents for the ensuing year: Profs. Bertrand (France), Minovici (Roumania), Nasini (Italy), Norris (America), Pictet (Switzerland) and Swarts (Belgium). The invitation from the United States to hold the next conference in Washington in September 1926, on the occasion of the fiftieth anniversary of the American Chemical Society, was cordially accepted.

An unique opportunity of seeing something of the enormous natural resources of Roumania was afforded to the delegates by the visits to the factories at Medias and Dicosanmartin, where natural methane is used not only as a source of heat and power, but also for the production of cyanamide. At the present time, the economic development is in its infancy, and there are still great possibilities for the scientific exploitation of methane of 99 per cent. purity issuing from the earth at a pressure of 20 to 30 atmospheres. The oil refinery of the Steaua Romana Company and the famous salt mines at Slanic were also inspected, and at all these places the same kindness and hospitality were freely extended to the delegates.

The Bucharest conference was a model of efficient organisation, and Prof. Minovici and his committee have earned the sincere thanks of those privileged to attend and to join in the excursion to Constantinople, which was a *grand finale* to a most wonderful experience.

C. S. GIBSON.