The Liverpool Meeting of the British Association.

THE meeting of the British Association which concluded on September 19 was in many ways notable, and marked the successful introduction of various changes in the local and scientific proceedings. In point of numbers it was the third largest meeting (Australia in 1914 excepted) in the long history of the Association, but the actual number of tickets taken is not the only criterion for success. Figures are, however, of some value; for one of the objects of the Association, namely, to spread knowledge of science and what it stands for, can be most successfully accomplished by an appeal to the public receiving ready response.

While the membership numbered 3296, not less than 15,000 people attended the free public lectures in Liverpool and the surrounding boroughs, while more than 7000 paid admission to the Scientific Exhibition held under the auspices of the Association in the Central Technical School on September 10-22, and this number does not include members of the Association itself, who were admitted free.

Further, the sectional meetings were almost all not merely well attended but often overcrowded, a condition which spoke well for the enthusiasm for scientific knowledge among the members, but also illustrated the attractiveness of the programmes.

The inaugural meeting, when the president delivered his address, was remarkable for the fact that the whole proceedings were broadcasted, and in two halls in Liverpool the wireless version was accompanied by lantern illustrations identical with and shown simultaneously with the originals shown during the address itself in the Philharmonic Hall. The address was well heard in most parts of the British Isles, and was even picked up so far away as Switzerland. This is, indeed, an example of the development of physical science since the last Liverpool meeting held in 1896.

The place of the customary second evening lecture was taken by a most successful scientific soirée given by the Local Committee at the University. A wonderful series of experimental and other exhibits had been arranged and a most comprehensive programme had been prepared, but unfortunately, owing to the awkward lay-out of the University Buildings, it must have been nearly impossible for very many of the large and enthusiastic gathering to see properly one-half of all the interesting things on view or to hear many of the excellent series of lecturettes. Such a soirée, however, is full of value and was greatly appreciated, and the excellence of all the arrangements at it reflected the greatest credit on all those concerned in its organisation.

A delightful reception was given by the Lord Mayor and Lady Mayoress in the splendid suite of buildings comprised by the Walker Art Gallery, Picton Reading Room, Hornby Library, and the Museum, which for the purpose were all thrown *en suite*. Seldom if ever have these rooms been seen to better advantage, and the arrangements for dealing with such a large gathering left nothing to be desired.

Important points in the work of the various Sections will be dealt with in special articles, but, as already mentioned, sectional activity was more pronounced than at any recent meetings.

In the physical and chemical sciences this was no doubt partially due to the presence of a remarkably large number of the most brilliant workers in these fields. With Sir Ernest Rutherford as president of the Association, Prof. McLennan as president of Section A, and Prof. Donnan of Section B, and the presence of Sir William Bragg, Sir Oliver Lodge, Profs. Bohr, Langevin, G. N. Lewis, Coster, Hevesy, and a host of other well-known names, these Sections could scarcely fail to be of unusual importance and interest. Indeed, Sections A and B represented an extraordinarily representative gathering of the great men of all countries. Other sections were equally happy in the importance of the subjects they presented, and possibly to the lay mind proved an even greater attraction than the recent developments of atomic theory and the electrical constitution of matter.

It was most satisfactory to find the true scientific interest of the meeting as undiminished as in pre-War years, and this Liverpool meeting a worthy successor to the very successful one of a quarter of a century ago.

The fifty-five general and sectional excursions arranged this year were all well patronised, the number of applications for many exceeding the possible number for the excursion. As practically all the excursions at this meeting had a more or less definite scientific interest as distinct from mere picnics, it is clear that members are as keen to follow science afield as in the lecture room.

At the close of the meeting a party went for four days on a visit to the Isle of Man. Granted good weather they should have seen all that is most interesting in the Island to archæologists, geologists, botanists, and marine biologists.

In conclusion a word must be said about the Reception Room. Few cities possess a hall at once so commodious, convenient, or beautiful as St. George's Hall. The fine tessellated floor (unknown to most even of Liverpool citizens, since it has not been on view for nearly twenty years) was greatly admired, and with the comfortable furnishing and floral decorations made a charming central meeting-place for members. The Reception Room was rarely empty, and helped in no small measure the success of the meeting by forming a convenient and comfortable rendezvous.

The Liverpool Meeting of 1923 will certainly be handed down as one of the really successful meetings of recent years. ALFRED HOLT.

The International Meteorological Conference at Utrecht.

SINCE the first steps were taken in 1853 towards international co-operation in meteorology, the International Meteorological Organisation has had a varied career, its meetings sometimes taking the form of congresses of plenipotentiaries appointed by Governments and convened through diplomatic channels, and sometimes of conferences of directors of meteorological services and observatories meeting without official aid.

Until 1919 the Organisation had no written constitution, but at the first Conference held after the War, at Paris in 1919, " Règlement de l'organisation météorologique internationale " was formally adopted. According to these rules the International Meteorological Organisation comprises: (1) Conferences of Directors; (2) the International Meteorological Committee; (3) Commissions. The Conferences are to meet every six years and to consist of " all heads of Réseaux of stations in each country and the Directors of Meteorological Observatories which are official and independent of one another," to whom are added a number of directors of private institutes and representatives of Meteorological Societies.

The International Meteorological Committee is

appointed by each Conference to act until the meeting of the next Conference, and is to all intents and purposes the executive body of the Conference, for it carries out the decisions of the past Conference and prepares the business of the next. Each member of the Committee must belong to a separate country and must be the director of an independent meteorological establishment. Commissions are appointed by the Committee " to advance the study of special questions," and members are appointed simply from the point of view of their personal qualifications to assist the work of the Commission. In this way the assistance of men of science and private gentlemen unassociated with official services is made available and freely used.

When the Conference met in Paris in 1919 the political state of the world was so abnormal that invitations could not be sent to some countries, and many other countries were not able to be represented. It was therefore felt that another Conference should be called as soon as conditions became more favourable and all countries without exception could meet in council. When the International Meteorological Committee met in London in 1921 it was considered that such a time was rapidly approaching, and the invitation of Prof. van Everdingen, director of the De Bilt Observatory, Holland, for a meeting of the Conference in Utrecht during 1923 was accepted. The return to normal political relationship has not been so rapid as was expected, and the troubles of the early months of 1923 made it look at one time as if the Conference would have to be postponed, but it was finally decided not to cancel the invitations which had been despatched in December 1922, and this course has been justified by the successful meetings of the Conference held in Utrecht on September 7–14.

The meetings of the Conference were preceded and followed by meetings of several Commissions. The Commissions for Agricultural Meteorology, Solar Radiation, Terrestrial Magnetism and Atmospheric Electricity, Weather Telegraphy and Maritime Meteorology were held before the Conference (September 3–6), and the Commission for the Study of Clouds and the Commission for the Upper Air met after the Conference (September 14). For the meetings of the Commissions and Conference fifty members were present from Argentine (1), Austria (1), Belgium (2), Brazil (1), Denmark (1), Spain (2), Finland (1), France (5), Great Britain (5), India (1), Japan (4), Norway (3), Holland (11), Poland (2), Portugal (1), Russia (2), Sweden (3), Switzerland (2), Czecho-Slovakia (2).

At the first meeting of the Conference on Friday, September 7, Sir Napier Shaw (Great Britain) was elected president, and Dr. Hesselberg (Norway) secretary-general. After the president's address had been delivered and certain business matters disposed of, it was decided to remit all reports and resolutions submitted to the Conference to five sub-commissions for preliminary consideration and the preparation of suitable recommendations. This distribution occupied the greater part of the meeting on Friday afternoon, when the Conference adjourned until the following Tuesday to give the commissions time to prepare their reports. When the Conference reassembled on Tuesday it worked very hard for three days considering the sixty odd resolutions submitted for its approval.

The great development of the use of wireless telegraphy in the dissemination of meteorological data has necessitated very intricate co-operation between meteorological services all over the world, especially in Europe. As the information is distributed broadcast for the use of any one who cares to receive it, it is highly desirable that the messages issued in the various countries should be of the same form and in the same code. As the result of untiring work of the Weather Telegraphy Commission under the guidance of its energetic president, Lieut.-Col. Gold, the New International Code is now used by twenty-two meteorological services. The arrangement of the times of issue of the wireless messages to prevent interference is also a difficult matter and necessitates close co-operation. It is not surprising, therefore, that twenty resolutions were submitted to the Conference by the Weather Telegraphy Commission. These dealt with such questions as the wording and interpretation of the code, times of issue, description of the stations, reduction of pressure to sea-level, additional observations, and the establishment of sub-commissions to watch the working of the code and to study proposals for improvements. A new departure was the agreement to add a new group of figures to certain messages, to allow experiments to be made of a new method of forecasting, based on a close study of cloud forms, which has recently been developed by the French Meteorological Office. It was very gratifying that it was not found necessary to alter the International Code, for it is extremely difficult to carry through a change when so many services are concerned, and it would jeopardise all the progress made towards the use of a uniform message if changes were made by some and not by others.

The resolutions submitted by the Commission for Maritime Meteorology were less numerous, but they contained references to several remarkable advances towards the extension of synoptic methods to ships at sea. The Commission recommended the adoption of a code to be used for wireless weather messages sent out from ships. The code consists of eight groups of figures, the first four of which are called universal groups and will be the same for all ships in all parts of the world; the second four, called national groups, will be different according to the office which organises the issue, and will be designed to meet the different needs of the various services. This proposal, which was accepted by the Conference, marks a great advance in international co-operation in all parts of the world. The Conference also recorded its appreciation of the work performed on board the *Jacques Cartier*. This is a French ship which has made experiments during voyages between America and Europe of collecting meteorological information by wireless telegraphy from ships and shore, preparing a meteorological chart of the Atlantic, and then broadcasting forecasts for the use of ships. The *Jacques Cartier* carries an officer of the mercantile marine trained in the French Meteorological Office, who is assisted by a clerk lent by that office. Further developments along these lines are to be expected.

The power of the method of " correlation " when applied to meteorological data is now generally recognised by meteorologists. The success of Dr. G. T. Walker, who employs this method in his forecasts of the Indian monsoon, is well known. Such work, however, fails unless homogeneous data extending over a long period are available. Prof. Exner, of Vienna, brought this matter before the Conference, and a resolution was adopted expressing the opinion that the publication of long and homogeneous data from a number of stations at distances of about 500 or 1000 kilometres from one another would be of great value. Not content with expressing this opinion, the Conference asked Dr. G. T. Walker to supervise the working of the resolution so far as Asia is concerned, and similarly Prof. F. M. Exner for Europe, Mr. H. H. Clayton for America,

and Dr. G. C. Simpson for Africa, Australia, and the ocean generally.

The Conference was unable to solve the problem submitted to it by the Commission for the Upper Air regarding the international publication of upper-air data. That these data should be collected and published in a uniform manner is highly desirable, but all the efforts of Sir Napier Shaw, the president of the Commission, to find a possible way of doing so have been unavailing. Such an undertaking would be expensive and would require financial aid from all countries concerned. In present circumstances it is not surprising that such aid is not forthcoming, and all the Conference could do was to make suggestions for meeting temporarily the pressing need for the rapid circulation of results obtained by means of sounding balloons. The data obtained by the use of aeroplanes and pilot balloons are too numerous to be handled internationally at present, and the Conference therefore recommended that each country should publish its own data.

Many resolutions dealing with agricultural meteorology, terrestrial magnetism, atmospheric electricity, solar radiation, and the upper atmosphere were adopted, but space does not allow of further details here.

One of the most important questions dealt with by the Conference was its relationship to the International Union of Geodesy and Geophysics. The great growth of the official weather services of all civilised countries has provided so many questions of administration and organisation for international consideration, that this side of the activities of the International Meteorological Organisation has swamped the scientific side. At recent meetings of the Conference and Committee there has been no time for scientific discussion, and therefore little to attract the members of the Organisation other than those connected with the great official meteorological services. A resolution was therefore considered to alter the rules in such a way as to limit membership of the Conference to directors of meteorological services. There was practically no opposition, and the rule governing the membership of the Conference now reads as follows :—

" The Officers of the Committee shall invite to the Conference all heads of Réseaux of stations in each country which are official (d'état) and independent of one another."

It was generally understood that this would remove from the work of the Organisation all questions of pure science, and that the science of meteorology would be considered only in so far as it is applied to the needs of the meteorological services. Practically, this is no change in the work of the Organisation, but it makes a clear distinction between the sphere of the International Union of Geodesy and Geophysics and the sphere of the International Meteorological Organisation. There should now be no material overlap between the work of the Union, which considers meteorology from the scientific side, and the work of the Organisation, which " studies only those questions which are of interest to all national meteorological services and which necessitate the utilisation of their own network of stations."

At the last meeting of the Conference, when the new International Meteorological Committee had been elected and Sir Napier Shaw was about to terminate his long connexion with international meteorology, Col. Delcambre, the head of the French Meteorological Office, rose and in a short eloquent speech expressed the regard every member of the Conference felt for Sir Napier Shaw and the debt which meteorology owed to him. He then proposed that Sir Napier should be elected an honorary member of the International Meteorological Committee, an honour never before bestowed. The proposal was accepted with prolonged applause and much feeling, for all felt that this was a happy way of marking their appreciation of the great work done by Sir Napier Shaw for international meteorology.

The newly elected Committee met the next day and appointed Prof. van Everdingen president, and Dr. Hesselberg secretary. The office of vice-president was left vacant for the present.

The general feeling at the end of the meetings, frequently expressed, was that good work had been done and much progress made. Good feeling between members from all countries was very marked throughout.

The Emerald Table.

By E. J. HOLMYARD.

ONE of the most famous of alchemical tracts is the Emerald Table (" Tabula smaragdina "), ascribed to the almost mythical " founder of chemistry," Hermes Trismegistos. Not merely is it regarded as a masterpiece by the medieval alchemists themselves, but later historians of chemistry have written innumerable articles in a vain attempt to solve its perennial mystery. The Latin text of the Tabula has been printed so many times that it is unnecessary to reproduce it here; it may be seen in Kopp's " Beitr. zur Gesch. der Chemie," p. 377, while an English translation is given by Thomson in his " History of Chemistry," p. 10.

The problems presented by the Tabula are shortly as follows: (1) In what language was it originally written? (2) What is its age? (3) Has it anything whatever to do with alchemy? The third of these problems need not be discussed in this place: it is sufficient to remark that it has always been considered alchemical in nature, and in that judgment we may reasonably acquiesce.

The question of the age of the work needs a fuller treatment. It was first printed at Nuremberg in 1541, under the title " Hermetis Trismegisti Tabula smaragdina, in ejus manibus in sepulcro reperta, cum commentatione Hortulani," but according to Kircher (" Oedipus Aegyptiacus," 1653, II. ii. p. 428) it is mentioned by Albertus Magnus in his " Liber de secretis chymicis," which is, however, probably spurious. Kriegsmann (" Hermetis Trismegisti . . . Tabula smaragdina," 1657) maintained that the work was originally written in the Phœnician language, and says that, according to some, the Emerald Table was taken by a woman called Zara from the hands of the dead body of Hermes in a cave near Hebron. Other authors inform us that Alexander the Great, on one of his journeys, discovered the sepulchre of Hermes and in it the tract inscribed upon a table of emerald. These obviously legendary accounts led many historians of chemistry to doubt the great age of the Tabula, and Thomson (*op. cit.* p. 13) says that " it bears all the marks of a forgery of the fifteenth century." Kopp, however, showed that it was well known to European alchemists in the middle of the thirteenth century, and that it was mentioned by Albertus Magnus (1193–1282) in a work which is