Our Astronomical Column.

AN INTERESTING METEORITE.—Vol. lvii. of the Proceedings of the United States National Museum contains an analysis by Mr. G. P. Merrill of a meteorite that was seen to fall at Cumberland Fells, Kentucky, on April 9, 1919. It is stated that if the object had not been seen to fall, its meteoric character would not have been suspected. It is a "meteoric breccia composed of fragments of two quite dissimilar stones." The lighter-coloured portion contained 55 per cent. silica, 39 per cent. magnesia, 3 per cent. ferrous oxide, with traces of some seventeen other compounds. The darker portion, which more closely resembles other analysed meteors, contains 42 per cent. silica, 9 per cent. ferrous oxide, 28 per cent. magnesia, 12 per cent. iron, etc. "Apparently the admixture of the two kinds of fragments took place prior to the evident compression."

The author conjectures that it is evidence of the destruction of some pre-existing planet, but the suggestion seems more reasonable that it is an earth-born meteor expelled in a mighty eruption in long-past ages. Sir Robert Ball was a strong advocate of the terrestrial origin of meteors, and it appears tenable in cases where the relative velocity is not very high. A lunar origin was suggested by Prof. Sampson; this also is preferable to the postulate of some purely hypothetical planet.

THE UNION OBSERVATORY, JOHANNESBURG.—Circular No. 47 of this observatory contains a search for proper motions by the blink method on two plates taken at Paris in 1887 and 1914. The region is R.A. 18h. 35m., N. decl. 31° 10′. The plates have already been measured at Paris, and the region is included in the Greenwich 1910 Catalogue, so the research was intended as a test of the comparative efficiency of the blink method. The result shows that it is undoubtedly the most rapid way of detecting all the displacements, but, of course, the method is purely differential, and absolute motions can be found only by using meridian observations of the reference stars on the plate. In the present case comparison with the Greenwich catalogue shows that the stellar background is moving 3·8″ per century towards 113°, so that the blink results are referred to an origin moving in this manner. It is found that each of the three methods of examining the region has revealed some motions not shown by the others, so that they all have their use. Mr. Innes gives the following summary of his results:—Two stars moving more than 20″ per century, eight between 20″ and 10″, seven between 10″ and 8″, twenty-seven between 8″ and 6″, and forty-nine (probably incomplete) below 6″.

GALACTIC CONDENSATION.—The results of an examination of stellar density at different galactic latitudes, derived from plates taken at Sydney, are given in Circular No. 47 of the Union Observatory, Johannesburg. The plates are fairly complete down to magnitude 15; there are very few of these faintest stars in the regions remote from the galaxy; the galactic condensation of the fainter stars is greater than that deduced at Groningen. Incidentally, Mr. Innes criticises Prof. Eddington's statement in "Stellar Movements" that the depth of the stellar system is about three times as great towards the galaxy as towards its poles, and also that the stellar density in the galactic regions is greater than in the polar ones. Mr. Innes shows that, granting, as he does, the latter statement, the ratio of depths becomes very much less than three to one; in other words, the stellar system is more spherical than previously stated.

The British Empire Forestry Conference.

THE Forestry Commission, constituted in November, 1919, has not been long in bringing about what promises to be one of the most important events in the history of forestry in the British Empire. We allude to the British Empire Forestry Conference which, with intervals for visits to certain selected forest areas in England and Scotland, held its sittings in London on July 7–22 under the chairmanship of Lord Lovat. The delegates included representatives from the United Kingdom, Australia, Canada, India, Newfoundland, New Zealand, South Africa, the Sudan, and most of the Crown Colonies. The main objects of the conference were to bring together such information as exists at present regarding the forest resources of the Empire, and to devise means of forming a more accurate estimate of these resources and of developing them to the utmost; to focus attention on the necessity for a more rational forest policy in the various parts of the Empire; to bring to light some of the more salient problems connected with technical forestry; and to consider certain important questions relating to forestry education and research.

No more opportune time could have been selected for such a conference. Of the many forcible lessons taught us by the Great War there are few which require to be taken more to heart than the lesson taught us in regard to the maintenance of our timber supplies. The view once held, that the timber resources of the Empire are inexhaustible, is no longer tenable, for we are already faced with a probable world-shortage of timber which will become more and more acute if steps are not taken to prevent reckless waste and to ensure that production keeps pace with exploitation. In the affairs of our Empire the scientific aspect of forestry has been too long relegated to the background, largely owing to misapprehension as to its true aims. For forestry, no less than agriculture, is an industry based on the productive capacity of the land, with this important difference: that whereas agricultural crops are harvested within a year, forest crops may take a century or more to mature. Hence in forestry, far more than in agriculture, the State must take a direct interest in the growing of the crops concerned, for the success of which continuity of management based on scientific principles is the keynote.

Among the most important proposals approved of by the conference was that relating to the formation of an Imperial Forestry Bureau to be located in London. This Bureau, constituted somewhat on the lines of the Imperial Mineral Resources Bureau, would act as a clearing-house of information on all subjects connected with forestry and forest products. It would undertake to collect, co-ordinate, and disseminate information on forest education, research, policy and administration, and the resources, utilisation, consumption, and requirements of timber and other forest products. In this way the Bureau cannot fail to prove a valuable link in forest matters between the various parts of the Empire.

Among the more important specific questions which it is hoped the Bureau will lose no time in taking up are the standardisation of technical terms used in forestry and the correct identification of timbers in commercial use. with the standardisation of their trade names so far as this is possible.

The question of forest research work was fully considered. The conference held that this work, for various reasons, is primarily the concern of the State. Speaking generally, forest research is divisible into two main branches: (1) that dealing with the grow-

ing of forest crops, and (2) that dealing with the utilisation of timber and other forest products. Each of these two main branches can be considered from two points of view, namely, the general and the local, the former being concerned with the principles and methods governing research work, and the latter with the application of principles to a limited range of conditions. General research may, consequently, be conducted at one centre for very wide areas, while local research must be conducted on the spot. Although the two main branches of research are intimately connected, from their nature they cannot always be conducted at the same institution; it is, however, impossible to lay down any hard-and-fast rule in the matter, and, provided adequate co-ordination is secured, there is no reason why the two branches of research may not be conducted successfully either together or apart, as circumstances may dictate. Most of the research problems of outstanding importance fall under the head of sylvicultural, statistical (that is, the collection and collation of data dealing with rate of growth and production), or technological. The conference recorded the opinion that in no part of the Empire is sufficient attention paid to the investigation of sylvicultural and statistical problems, considering their great importance in connection with the future maintenance and economic working of the forests; accordingly it recommended that each part of the Empire should include in its forest service at least one research officer, and that adequate funds should be placed at his disposal to ensure progress in these branches of research.

Specific proposals were made in respect of forest research work in different parts of the Empire, and it may be of interest to note the views of the conference in regard to the organisation of work in the United Kingdom. It was held that requirements would be met by the establishment of (1) a research institute to deal with problems connected with the growing of forest crops, and (2) a research organisation which should include a central institute to deal with problems connected with the utilisation of forest products. It was proposed that the latter should be governed by a research board composed of official and non-official members, the board being an executive body similar to the research boards established by the Department of Scientific and Industrial Research. Such a board, which would have definite sums allotted to it for research on forest products, would decide where any particular problem should be investigated, and distribute the funds at its disposal accordingly.

The question of forestry education in its various aspects was fully discussed, and although this question presented numerous difficulties the conference succeeded in clearing the ground to a considerable extent. In approaching this question sufficient discrimination is not always shown between the training of forest officers for service in different parts of the Empire and the training in forestry of owners and managers of private woodlands and others who do not desire to take the course of instruction required for the various forest services. In the United Kingdom the training of owners and managers of private woodlands is a matter of great importance in view of the large proportion of such woodlands existing in the British Isles. Such training, however, must be carried out on somewhat different lines from the training of forest officers for the various parts of the Empire. So far as concerns the latter, the conference held that one institution should be established in Britain for the training of forest officers for the United Kingdom and for those parts of the Empire which, for climatic or other reasons, may be unable to establish such an institution of their own, or desire to send students to Britain for training. Students would be selected from graduates who have taken honours in science at any recognised university. An integral part of the work of the institution would be to arrange supplementary courses at suitable centres for students requiring special qualifications, and also special courses for forest officers from any part of the Empire, whether at the institution itself or at centres of training in other parts of the world. A department of research into the formation, tending, and protection of forests would be associated with the training institution.

In view of the success of the conference just held, and of the far-reaching results likely to follow, it is proposed that this should be only the first of a series of similar forestry conferences to be held at intervals of a few years in different parts of the Empire. Such conferences cannot fail to stimulate public opinion in regard to what is a very important national question or to advance the cause of scientific and economic forestry, which has hitherto been too much neglected by the Empire at large.

Colloidal Electrolytes.

COLLOIDAL electrolytes are defined as solutions of salts in which one ion has been replaced by a heavily hydrated multivalent "micelle," or cluster of ions, carrying an electrical charge equal to the sum of the charges of the constituent ions, and (by reason of its reduced resistance to movement through the fluid) serving as an excellent conductor of electricity. This new class of electrolytes probably includes most organic compounds, containing more than eight carbon atoms, which are capable of forming ions—*e.g.* proteins, dyes, indicators, sulphonates, and soaps; it may also include inorganic compounds, such as chromium salts, tungstates, silicates, etc., which have a marked tendency to form highly complex ions. Work on this subject has been in progress in the laboratory of physical chemistry at the University of Bristol during a period of several years, and the results of the investigation have recently been published by Prof. J. W. McBain in papers communicated to the Royal Society (Proc. R.S., 1920, A, 97, 44–65), to the Chemical Society (Trans C.S., 1919, 115, 1279–1300), and to the American Chemical Society.

The earlier experiments at Bristol showed that soap solutions possess a high degree of electrical conductivity, not only in dilute, but also in concentrated, solutions. This electrical conductivity could not be attributed to hydrolysis, since the absence of all but mere traces of free alkali could be demonstrated by measurements both of rate of catalysis and of electro-motive force. The high conductivity of the solution must therefore be due to the soap itself. Experiments on the depression of the freezing-point of soap solutions, and later experiments on the lowering of vapour-pressure, showed that, whilst the salts of the simpler fatty acids have an osmotic activity diminishing steadily as the concentration increases, salts of the higher homologues (from C_{12} upwards) have an osmotic activity which passes through a minimum and then through a maximum before finally diminishing to a low value in the most concentrated solutions. The high osmotic activity of the soaps in concentrated solutions, coupled with the remarkable electrical conductivity of these solutions, is explained most satisfactorily by the theory of the ionic micelle. In its simplest form this micelle might be merely a polymer of the negative radical, in a strongly hydrated condition, but it is possible, and even