

IMPERIAL EDUCATION CONFERENCE.

BY invitation of the Chief of the Imperial General Staff, the universities, together with various institutions concerned with technical, commercial, and agricultural education, sent representatives to a conference held at Australia House on June 11 and 12 for the purpose of discussing problems which have presented themselves to the War Office in connection with the working of the educational schemes within the British Army and the Forces of the Dominions. Sir Henry Wilson described Lord Gorell's work as an effort to weave education into the life of soldiers, to make use of all special knowledge and skill possessed by enlisted men, and to hand back the soldiers on their return to civil life better citizens than they would have been but for their experience in the Army.

Mr. Fisher, President of the Board of Education, said that the great war from which we are just issuing has been, in a sense never before equalled, a war of science. Marvellous discoveries have been made in connection with aerial warfare, warfare against German submarines and German gas, but the most surprising invention of all was the invention of education in the Army. It was an invention scarcely second in importance to the invention of fire-arms. Referring to the calling together for the first time of young men from every Dominion overseas and the inclusion of many of them after the war in the home universities, he said that he would like every Englishman who went to the Dominions, and every member of our Dominions who settled in any other part of the Empire, to feel that his children would have the best educational opportunities that the Empire could afford. He would like to see the most promising students, whatever might be their special aptitudes, able to migrate to the university, in which they could attain to the best opportunity of development in their particular subjects.

Interchange of students and the need for a greatly strengthened Universities Bureau were two subjects which largely occupied the attention of the conference. The directors of education for the several overseas Forces emphasised the great need which they had experienced of a central office at which they could obtain information regarding the regulations, the activities, and the *personnel* of the various universities. Their demand for closer centralisation and uniformity of procedure led to a good deal of friendly banter. The diversity of the British universities, Sir Donald MacAlister pointed out, is their glory. They are able in an exceptional degree to adapt themselves to local conditions, to seize opportunity, and to make experiment. He contrasted them in this respect with the universities of France, from a visit to which, as one of the guests of the French Republic, he had just returned. All the speakers, however, agreed that co-operation amongst the universities is greatly to be desired. As Sir William Ashley put it, "the more they become dependent upon State support, the more desirable will it be that they should take counsel together."

The functions which might be undertaken by the Universities Bureau, if it were adequately staffed and endowed with funds, were defined by many speakers. President Tory would have it an office from which he could obtain information about men suitable for employment by the universities overseas. Prof. Ramsay Muir desired that it should undertake very great responsibilities in connection with the universities of India—work which no Government Department could perform to the complete satisfaction of our Indian fellow-subjects, because the Government must always be suspected of an ulterior aim, whereas the Universities Bureau would be managed by a federation, of which the Indian universities themselves would form a part.

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Sir Henry Hadow, who presided over the session of Thursday morning, emphasised the importance of encouraging a free interchange of students for research work, and especially of young teachers. If migration is to be made popular and successful, the university laboratories will need to be well equipped, especially on the technological side. Technological courses should be widened and made to include as much general mental training as can be introduced into the curriculum. Mr. A. P. M. Fleming, speaking on behalf of the Federation of British Industries, urged that heads of departments are needed who are well educated in a general as well as in a technical sense. For many years to come the demand for men capable of undertaking research will greatly exceed the supply.

Lord Bledisloe at the afternoon session described agriculture as the industry most dependent upon science, and at the same time the most backward in recognising its obligation. He announced that the Board of Agriculture is prepared to participate in organising in London an Imperial Bureau of Agricultural Information. Dr. J. W. Robertson, ex-Principal of Macdonald College in the McGill University, described the successful working of "illustration" farms. The conference closed by adopting a resolution proposed by Sir Percy Fitzpatrick:—"That there is a general desire throughout the Empire that means shall be found to give practical effect to the policy, aspirations, and suggestions expressed during the four sittings of the Conference, and, in order that this may come about, the conference requests the Imperial Education Committee to submit to the Prime Minister of the United Kingdom a report of its proceedings, with a request that it be brought to the notice of all the Prime Ministers of the Empire, either at the Imperial Conference, or in such other manner as may be deemed appropriate to ensure early and practical results."

THE ROYAL OBSERVATORY, GREENWICH.

THE report of the Astronomer Royal of the work done at the Royal Observatory during the year ended on May 10 was presented to the Board of Visitors on Saturday, June 14. Some of the details of the report are here summarised.

One of the two Chief Assistants, Mr. Jones, who had been engaged in optical work at Woolwich for nearly three years, resumed his duties at the observatory soon after the armistice. Mr. Jackson, the other Chief Assistant, five members of the permanent staff, and eleven temporary computers who have been serving with the armies abroad in various capacities, returned to the observatory on different dates since February 1. With so many members of the staff absent it is not surprising that the work of the observatory has had to be curtailed in several ways, and the number of transits recorded with the transit-circle during the year was 3224, of circle observations 2818, which figures may be compared with an annual average number of 12,000 before the war. The sun, moon, planets, and fundamental stars have been observed on the meridian throughout, but other stars only to a limited extent. The observations of the moon with the transit-circle and with the altazimuth show that the increase of the error of the moon's place in the "Nautical Almanac," which has persisted since 1883, when Newcomb's empirical correction to Hansen's tables was introduced into the "Almanac," has now ceased, for the mean correction to the tabular right ascension, +0.92s., shown by the observations in 1918, is practically identical with that found in 1916 and 1917. The corresponding correction required by the "Connnaissance de Temps," which depends on Delaunay's tables as revised by Radau and Andoyer, is +0.28s.

The observations with the Cookson floating zenith-telescope have been carried on throughout the war, and the result of a discussion of seven years' observations with the instrument was presented to the Royal Astronomical Society on June 13. Besides a determination of the variation of latitude at Greenwich, which may be considered trustworthy, as the discordances from a smooth curve rarely exceed a few hundredths of a second of arc, the observations also furnish a value of the aberration constant, which, deduced from the seven years' observations, is $20.442''$, corresponding to a solar parallax of $8.815''$. The values derived from the observations of individual years show rather a large range, and the possibility of systematic disturbing causes is being investigated.

Turning to the equatorials, the 28-in. refractor was at the disposal of M. Jonckheere until he returned to his home in Lille in January last. The observations of double-stars made by M. Jonckheere have been published in the *Astronomical Journal*. The object-glass of the 26-in. refractor, which had been dismantled in September, 1917, was replaced on October 15, 1918, and photographs of the Galilean satellites of Jupiter were taken on twenty-six nights during the apparition of last winter for Dr. de Sitter, who is making a research on the elements of their orbits. Photographs for stellar parallax have also been taken with this instrument. The 13-in. object-glass of the astrographic telescope is now in Brazil, having been used in observation of the eclipse of May 29. With this instrument a series of photographs were taken of the nova which appeared in Aquila in June, 1918, to determine its variation of magnitude in the subsequent months. The work of the Astrographic Catalogue is being supplemented by determination of the proper motions of the stars contained in it by comparison with earlier catalogues, and also by direct comparison of pairs of plates taken at an interval of about twenty years.

The record of the sun-spots has been continued, and photographs of the sun were obtained on 208 days. The measurement and reduction of the sun photographs for 1917, the series being completed by photographs taken at the Cape, is in progress. During the period covered by the report the activity of the sun has been considerable, but there has been, on the whole, a perceptible decline since the great disturbances of August, 1917.

The mean values of the magnetic elements for 1918 and three previous years are as follows:—

	Dec. W.	Horizontal force	Vertical force	Dip
1915 ...	14 56.5	0.18508	0.43315	66 51.8
1916 ...	14 46.9	0.18494	0.43313	66 52.7
1917 ...	14 37.0	0.18477	0.43305	66 53.6
1918 ...	14 27.2	0.18462	0.43290	66 54.2

The annual diminution of declination increased considerably about 1910, its average value from 1900-10 being $4.9'$. The horizontal force which had been increasing since measurements were begun at Greenwich in 1846 reached a maximum about 1910, and is now diminishing. The dip which had been diminishing since measurements were begun in 1843 reached a minimum about 1913, and is now increasing.

The principal meteorological features reported for the year ended April 30, 1919, are:—The mean temperature was 49.5° , or 0.1° below the average of the seventy-five years 1841-1915. The highest temperature in the shade was 89.8° on August 22, and the temperature exceeded 80° on six days. The lowest temperature was 15.5° on February 9, and on fifty-five days it fell as low as 32° .

The duration of bright sunshine registered was 1436 hours out of a possible 4456 hours. The rainfall was 31.14 in., or 6.90 in. above the average for the

period 1841-1915. The number of rainy days (0.005 in. or more) was 194, the largest number for thirty-six years; 7.34 in. of rain fell in July, 1918.

The work of rating and issuing the chronometers for use of the Navy has been excessive. During the year 8631 chronometers and watches were received and 6713 issued. The number sent for repair was 2990. The corresponding figures in the report of 1914 were 2094, 2110, and 934 respectively. The wooden time-ball on the observatory is to be replaced by one of aluminium, and the work is now in progress.

The report ends with a reference to the system of time-zones for time-keeping at sea, which the Lords of the Admiralty have decided to establish in H.M. Navy; also to the substitution of a day beginning at oh. midnight for the astronomical day in all nautical publications. The Admiralty has decided that the alteration shall be made in the "Nautical Almanac" beginning in the year 1925, and in the "Admiralty Tide-Tables" for 1920.

THE SOUTH-EASTERN UNION OF SCIENTIFIC SOCIETIES.

THE twenty-fourth annual congress of the South-Eastern Union of Scientific Societies was held in the Guildhall, London, on June 11-14, under the presidency of Dr. A. Smith Woodward. In his opening address the president referred especially to the pioneer work of Mantell in discovering the fossil giant reptiles in the Sussex Weald, and showed how the later finds in Belgium and North America had partly modified, partly extended, his conclusions. He mentioned that Mr. Reginald W. Hooley had recently found in the southern cliffs of the Isle of Wight a skeleton of an iguanodon which rivalled those from Bernissart, Belgium, in perfection. The specimen showed a finely granulated skin. The sudden ending of the "geological age of reptiles," as Mantell named it, still awaited explanation, for the distribution of the giant reptiles was almost world-wide at the time. The mammals found the land practically vacant for occupation, and none of them attained a larger size than a tapir until the Middle Eocene period.

Mr. L. W. Chubb described the woodlands of London, and showed the importance of the work of the Commons and Footpaths Preservation Society. The congress passed a resolution urging the London County Council to secure Castle Wood on Shooter's Hill, Woolwich, as a public resort. Dr. A. B. Rendle, in an address to the botanical section, referred to the facilities for research at the South London Botanical Institute, which was founded by the late Mr. A. O. Hume. It was important to compare the British flora in detail with that of the European continent, and much remained to be done in studying growth-stages. Mr. C. C. Fagg reported on progress with the regional survey, and showed several maps on which he had plotted records in the neighbourhood of Croydon. Mr. Reginald A. Smith exhibited a map of London on which he had marked the finds of Palæolithic implements in their relation to the river-terraces. The Rev. T. W. Oswald-Hicks showed a series of lantern-slides illustrating the life of mosquitoes, which he had prepared, to be lent to the societies of the union. In this way he hoped to spread an interest in the subject and enlist the help of more observers and collectors of mosquitoes. Mrs. Plomer Young mentioned that several thousand lantern-slides illustrating natural history were now at the disposal of the union, and could be borrowed by the constituent societies. Sir Edward W. Brabrook was elected president of next year's congress, which is to be held at Eastbourne.