

Astronomy and International Co-operation

IN his presidential address to the Royal Astronomical Society at its annual meeting on February 9, Prof. F. J. M. Stratton sketched the development of schemes of international co-operation in astronomy during the last hundred years. The first such scheme was that of the Berlin Academy for a chart and catalogue of stars down to the 10th magnitude, to be completed by a number of continental astronomers by 1828; it was actually not completed until 1858. Along the same lines were the plan of the *A.G.* zone catalogues drawn up in 1869, and later still the more ambitious photographic "Carte du Ciel" set on foot in Paris in 1887 and not yet completed. The founding of the "Centralstelle" for astronomical telegrams and the various activities of the *Astronomische Gesellschaft* kept the Germans for many years the chief organisers of joint astronomical schemes, but after the Permanent Commission of the *Carte du Ciel* had been established with its occasional gatherings of astronomers at Paris, the headquarters for international astronomy of position shifted to France.

In Paris were held conferences on fundamental stars and on co-operation in the work of preparing national ephemerides; there too were established the *Bureau de l'Heure* and the *Bureau des Poids et Mesures*. The United States became active in this sphere at the Washington Conference of October 1884, when the meridian passing through the centre of the transit instrument at the Observatory of Greenwich was adopted as a single prime meridian for all nations. From the United States, too, came the impetus which founded the International Solar Union; this body performed for solar and stellar physics the same function as that of the Permanent Commission of the *Carte du Ciel* for the older astronomy.

The War cut right across the older organisations, and in 1919 the International Astronomical Union was founded in an attempt to start once again the sadly crippled forces of co-operation. The new body set up more than thirty committees to deal not only with the work inherited from the earlier organisations but also with many branches of astronomy, such as double stars, which had remained unprovided for owing to the casual way in which the earlier schemes had come into being. Over the whole field of astronomical research the Union, without in any way interfering with individual liberty, has endeavoured to provide a common meeting ground for the discussion of problems and the preparation of schemes of mutual co-operation. Valuable reports from the various committees have been published, notably on standard wave-lengths, stellar photometry and stellar classification; these have been published in the volumes of transactions freely distributed to observatory libraries.

Grants in aid have been made by the Union for the publication of tables and observations, for printing volumes of the "Carte du Ciel", for the *Bureau de l'Heure* at Paris and the *Bureau of the Variation of Latitude* at Mizusawa, for computations in connexion with the recent opposition of Eros. (The *Astronomer Royal* gave an account of the progress of this work at the same meeting of the Royal Astronomical Society—a valuable illustration of the work of the Union.) In all, grants of more than £14,000 have been made by the Union to its committees. The present financial world crisis has not left the Union unscathed, but it is continuing "alive and responsive to new needs and changing conditions, a powerful support of astronomy in all its branches and a centre of co-operative good-will among the astronomers of the whole world".

History and Management of the Hope Farm, Jamaica

TO the British Empire, the problem of milk production in the tropics is of paramount importance. It is a problem which at the present moment faces both the administrators and their agricultural advisors in each one of the British tropical dependencies and in India. The "History of the Hope Farm and Part 1 of the Jamaica Herd Book of Pure Bred Cattle" by H. H. Cousins, is an outstanding contribution to this subject (Pp. vi+308+59+54 plates. Kingston, Jamaica: Government Printing Office, 1933). This Jamaican estate, becoming derelict, passed in 1909 into the hands of the Government and represents a somewhat unusual incident in Government operations by which an officer was called upon to justify, as a commercial concern, the acquisition of land as public property, practically without capital and dependent upon the earnings of the enterprise for its development. The assets of the Farm now show a gain of nearly £16,000, or an annual increase averaging £751 from 1910 until 1931.

What will mostly appeal to livestock men in the tropics is the detail which has been put forward concerning the productivity of cows of many pure breeds and of their crosses. Many of the imported cows were of British breeds and came from Great Britain or North America. From India came

the Nellore, Sahiwal and other Zebu cattle. The lifetime history of each cow is clearly set out. Several experiments in inbreeding were attempted, but the only one which appears to have had any measure of success involves the mixture of the Zebu with the Jersey. The excellent photographs, studied in conjunction with the records of the animals concerned, provide useful information.

An interesting point in the organisation of this farm, and one which may be commended to the attention of Colonial administrators, relates to its finances. It was recognised from the start that this enterprise should be operated on a separate account at the Treasury. The approval of the Secretary of State was obtained for this departure from the usual system of departmental finances, whereby expenditure was 'debited' and the revenue 'credited' to the general account without any direct connexion between the two. The method adopted for Hope Farm allows that freedom of decision which is essential for the proper conduct of a farm.

More important still is that where genetic experiments with cattle are concerned, the financial establishment of a farm should be along these lines, in order that there may be continuity in method over that period of years which is demanded by the nature of the investigation. Too often has a change in the

policy of the Government resulted in the 'axing' of an inquiry of this nature. Twenty-five years is not too long for such an experiment, upon which it may be a waste of time and money to embark unless there is some guarantee that the work will be carried forward. Mr. Cousins has achieved this and it is greatly to his credit and to his foresight at the time the Farm was established. After serving the Colony for a quarter of a century, he is now retiring from the post of Director of Agriculture. This report represents an important section of his work and he must indeed be a proud man who can leave such a memorial of service behind him.

University and Educational Intelligence

CAMBRIDGE.—Dr. P. E. Vernon, of St. John's College, has been appointed to the Pinsent-Darwin studentship for three years.

J. A. Steers, of St. Catharine's College, has been appointed to represent the University at the International Congress of Geography to be held in Warsaw in August–September of the present year.

At Pembroke College, J. W. F. Rowe, University lecturer in economics, has been elected to a fellowship.

SHEFFIELD.—Mr. Arthur Pool has been appointed lecturer in mental diseases.

The Council has received a gift from Dr. Foggo of old medical books, anatomical plates, surgical instruments, etc., belonging to the late Dr. Rooth, of Dronfield.

DR. H. E. C. WILSON, lecturer in physiology in the University of Glasgow, has, with the approval of the Government of India, been appointed professor of biochemistry and nutrition at the All-India Institute of Hygiene and Public Health, Calcutta.

APPRAISEMENT of fitness for admission to secondary schools is a task which each year taxes the ingenuity of local education authorities. The technique evolved in grappling with its difficulties in the West Riding of Yorkshire is set forth in some detail in a report by the Education Officer, on the examination for county minor scholarships of some fourteen thousand children of ages 10–12 years, of whom about one seventh were successful. To the written examination in English and arithmetic there was added this year a group intelligence test taken by all candidates in place of an oral test. This was favourably reported on by Prof. G. H. Thomson and was found helpful in dealing with 'border line' cases. The chief examiner's report includes a careful estimate of the evidence afforded by the answer papers in arithmetic of divergence in mental capacity between boys and girls and an expression of a fear "that too often the girls' natural clinging to painstaking methods is reinforced by their training, instead of being to some extent supplanted by the development of that initiative so necessary—even for women—in every walk of life". The report on the examination in English quotes a number of surprising and psychologically interesting 'howlers'. The following essay on "The Importance of Little Things" affords (with many others) evidence, the examiner believes, of ill-assimilated health talks: "An atom is a small animal. It has no legs or arms but has a mouth and means of indigestion. Without these we cannot live: scientists have proved it".

Science News a Century Ago

Baldwin's Locomotive *E. L. Miller*

On February 18, 1834, Matthias W. Baldwin, the founder of the Baldwin Locomotive Works, Philadelphia, completed his second locomotive, the *E. L. Miller*. His first locomotive, *Old Ironsides*, completed in November 1832 for the Philadelphia, Germantown, and Norristown Railroad, was a four-wheeled engine modelled on the plan of Stephenson's engines. The *E. L. Miller*, built for the Charleston and Hamburg Railroad Co., however, was a six-wheeled engine with two driving wheels $4\frac{1}{2}$ ft. in diameter and four smaller wheels attached to a swivelling or 'bogies' truck similar to that first introduced into the locomotive *Experiment* in 1832 by John B. Jervis. The *E. L. Miller* had two cylinders of 10 in. diameter, 16 in. stroke, and it weighed about $7\frac{1}{2}$ tons. Baldwin, who was born in Elizabeth, New Jersey, on December 10, 1795, began life as a jeweller and silversmith. In 1825 with David Mason he set up as a machinist and soon began the construction of small stationary steam engines. With the advent of the steam railway in England, Franklin Peale, the proprietor of the Philadelphia Museum, commissioned Baldwin to make a miniature locomotive. With imperfect sketches of the engines which had taken part in the famous Rainhill trials of 1829, Baldwin made a small engine which drew two cars around a track in the Museum, and it was the success of this model which led to his receiving the order for the *Old Ironsides*. Baldwin died in 1866, by which time he had built more than 1,000 locomotives.

Prediction of the Tides

In 1833 our knowledge of the tides was very imperfect. Bernouilli and Laplace had attempted to formulate rules for prediction on theoretical grounds but without much practical success, and although several tide-tables were published annually, they differed considerably from one another. Sir John William Lubbock had for nineteen years been collecting tide observations for the Port of London, and on February 20, 1834, in a paper "On the Tides" read before the Royal Society, he included tables for the prediction of the tides at London, far more accurate than any previously available. He also described numerous observations on the influence of the wind, which is of considerable importance in limiting the accuracy with which tides can be predicted. The analysis of Lubbock's great mass of data was mainly due to the Rev. William Whewell, who introduced new mathematical methods into the problem. His results were published in a paper read before the Royal Society on January 9, 1834: "On the empirical Laws of the Tides in the Port of London, with some Reflections on the Theory".

Anniversary Meeting of the Geological Society

The anniversary meeting was held on February 21 at the Society's apartments in Somerset House; Mr. Greenough was continued president, and R. I. Murchison and H. Warburton were elected to succeed Dr. Fitton and Prof. Sedgwick, the retiring vice-presidents. It was announced that the proceeds of the Wollaston donation fund had been awarded to M. Agassiz in testimony of the high opinion entertained of his work on fossil fishes, and to encourage him in the prosecution of his important undertaking. The Society dined at the Crown and Anchor Tavern,