

OUR ASTRONOMICAL COLUMN.

THE HOTTEST STARS.—Under this heading, Dr. Ant. Pannekoek communicates a short note to the *Astronomische Nachrichten*, No. 4657. It relates to the list of spectral-photometric measures made by Herr H. Rosenberg (see this column, May 29) of the temperatures of the hotter stars. Dr. Pannekoek states that from this list a regular increase of the figures takes places with the class-number of the spectra according to Miss Maury's classification. Whether this increase commences at the beginning or in which class the helium or the whitest or hottest stars are to be found cannot be clearly stated in consequence of the few stars discussed. Dr. Pannekoek utilises the large quantity of material available in the catalogue of colour-estimations by Osthoff, and while they give no results of absolute temperature, they are of value from a relative point of view. The comparison of these values with Miss Maury's types brings out the result that lowest colour number corresponds with her class IV. or IV.-V., or the typical helium stars. On either side of these classes the colour numbers increase, and the temperature decreases not only on the side of the Sirian stars of the first type, but also towards the Wolf-Rayet stars. The following is the complete table which he gives in the paper, but here Miss Maury's classes are preceded by the equivalents in Sir Norman Lockyer's classification for comparison:—

Class (Lockyer)	Class (Miss Maury)	Colour	No. of stars
Argonian	I	2.47	6
Alnitamian	II	2.36	10
Crucian	III	2.30	9
Crucian, Achernian	IV	1.94	14
—	IV-V	1.62	10
Taurian, Algolian	V	2.11	9
Rigelian, Algolian	VI	2.16	10
Algolian, Markabian	VII	2.27	23
Cygnian, Markabian	VIII	2.37	34
Sirian	IX	2.64	20
Sirian	X	3.11	14
Procyonian	XI	3.40	9
—	XI-XII	3.41	4
Polarian, Procyonian	XII	3.68	17
Polarian, Procyonian	XIII	4.12	13
Arcturian	XIV	4.45	12
—	XIV-XV	5.09	9
Arcturian	XV A	5.18	18
Arcturian	XV B	5.35	26
Arcturian	XV C	5.55	31
—	XV-XVI	6.34	5
Aldebarian	XVI	6.47	17
Antarian	XVII	6.80	15
Antarian	XVIII	6.74	15
Antarian	XIX	6.67	6

A PHOTO-VISUAL COMPARATOR FOR THE IDENTIFICATION OF MINOR PLANETS.—As the only means whereby a minor planet is distinguishable from a star of the same magnitude is its proper motion, its identification is often a matter of considerable labour proportional to the planet's magnitude and the uncertainty of the ephemeris. To this end M. J. Lagrula employs an ingenious arrangement which he describes in a note presented to the Paris Academy of Sciences (*Comptes rendus*, No. 15). It consists of a binocular combination of telescope and microscope, forming what is essentially a stereo-comparator, in which a coloured image of a photographic positive of the region to be examined is superposed on the image seen in the telescope. All objects visible in the field of the telescope, except small planets which have no counterpart on the photograph, are distinguished by the presence of a coloured disc. For use with the Gautier

equatorial of the Nice Observatory copies of the photographic charts of MM. Palisa and Wolf have been found eminently suitable. As an example of the rapidity and efficiency of operating with the device the author instances detecting within five minutes an error in the published ephemerides of (233) Asterope.

METEOR DUST AS A MEASURE OF GEOLOGIC TIME.—In *Science*, No. 957, Prof. Alfred C. Lane directs attention to the possibility of using the proportion of contained meteor dust as a measure of the rate of formation of strata, and hence as a criterion of geologic time. He calculates that the earth gains 20,000 grams of cosmically derived nickel per square kilometre per annum. From this figure and the nickel content of the abysmal red clay he estimates that a layer one metre thick of the latter requires 8700 years to accumulate. The professor urges members of proposed polar expeditions to complete Nordenskjöld's observations by determining the rate of deposition of cosmic dust, and optimistically anticipates that within this century there will be drilled a hole in the bottom of the sea which will give us the other datum to be determined.

THE ROYAL AGRICULTURAL SHOW.

THE extremely successful Royal Show held at Bristol, July 2-5, illustrated in a striking way the general progress being made in agriculture, horticulture, and forestry, but presented very little calling for comment from the scientific point of view. Among livestock, a remarkable novelty was the pen of primitive breeds of sheep—and crosses from the same—exhibited by Prof. Cossar Ewart and Mr. H. J. Elwes. This throws some light on the origin of domesticated sheep, and also suggests the possibility of establishing one or more new breeds capable of thriving on poor upland pastures in this country, and of yielding more valuable wool than that of the ordinary hill-breeds.

In the Agricultural Education Exhibition, Rothamsted showed an interesting series of tomato-plants in pots to demonstrate the advantage of partial sterilisation of soil in various ways. Wye College—as usual—exhibited a striking series of pests, fungoid (including a new disease of apple-buds) and insect (some in the living state). The University of Bristol was represented by the associated Royal Agricultural College (received in deputation by H.M. the King on July 4) and Long Ashton Fruit and Cider Institute. The chief feature of the former was a collection of wool-staples, including a series from the sheep in the above-mentioned exhibit of Ewart and Elwes. Long Ashton, as the chief British horticultural research centre, is evidently working with increased energy since its reconstitution and extension, and one of its most interesting exhibits consisted of specimens of a new disease of pear-blossoms, due to bacteria as yet unnamed, and causing the young fruits to fall early. The Nature-study Section, including exhibits from several western and south-western counties, was a decided improvement on past years, proving that school work is now more systematic than formerly. Gloucestershire is to be congratulated on classifying its material by subjects and not by schools.

The exhibit of British tobaccos attracted much notice, but most of those who sampled the specimens were not impressed by their quality, though no doubt home-grown material may prove useful for fumigation purposes. The Forestry Section was particularly

good, and demonstrated increasing interest in a neglected industry of national importance.

Among the implements, the increasing necessity for labour-saving contrivances is evidently continuing to produce continual improvements and new types. The set of milking machines attracted a great deal of attention, especially the Swedish Omega form, of vacuum type, which gained first place in trials held earlier in the year. The difficulty of cleansing milking machines has been one of their great drawbacks, but this is largely overcome in the Omega by employing short transparent celluloid tubes instead of long rubber tubes. Probably the most ingenious new appliance to be seen in the show was the "Erto" potato-planting machine. This, in one operation, digs trenches of the desired depth, plants the tubers at any distance apart, sows manure if required, and covers up the furrows. Novelties were not wanting among the exhibits of various well-known firms specialising in farm and garden plants. Suttons showed a new variety of sunflower with red centre, Marsters new varieties of wheat, and Gartons a new oat—the "Leader"—the first to yield five grains to a spikelet.

The most striking innovation on a large scale at the Bristol Show was the establishment of an Overseas Section, and it is to be hoped that this feature may be permanently retained. So many persons are emigrating overseas that it is important to give them every chance of seeing Colonial produce and studying Colonial methods. Readers of NATURE are mostly familiar with the kind of exhibits represented in this section, but large numbers of the populace last week were obviously keenly interested in the rubber series shown by the Federated Malay States, and the sugar samples from the West Indies and British Guiana, including food products for human and animal consumption, and even a sugar-cane plant in a living and healthy state. The time appears to have come when intending colonists should all have the opportunity of elementary instruction in Colonial or tropical agriculture before leaving the home country.

J. R. A.-D.

BEDFORD COLLEGE FOR WOMEN.

THE opening of the new buildings of the Bedford College for Women on July 4 by her Majesty Queen Mary was an important event in the history of university education.

A committee was formed in 1847 by Mrs. Reid and other ladies interested in women's education, lectures being given in Mrs. Reid's private house, and in 1849 the college was definitely started in a house of its own in Bedford Square, from which fact the college takes its name. In 1874 the college moved to Baker Street, and from that year its growth has been rapid. As time went on the accommodation at Baker Street was increased until every available square foot was covered; when it became evident that a move into larger and less noisy buildings was inevitable. For this purpose the council acquired the lease of South Villa, standing on land adjoining but outside Regent's Park. Three acres of the site were added to the park, about eight acres being left for the purpose of the college and its grounds. An appeal was issued for the necessary building fund, and a loyal response was given by old students and other friends of the college. Among other gifts may be mentioned a library and its furniture by Lady Tate, a dining-hall and common-rooms by Mrs. Oliver, a grant of 30,000*l.* from the London County Council, and an anonymous gift of 30,000*l.*

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The new college accommodates some 500 students, and (except for the library) was designed by Mr. Basil Champneys. It consists of four parallel rows of buildings: the library, a science block for chemistry, physiology, and physics, another science block for zoology, botany, and geology, and the hall and rooms for about eighty residents. These rows are connected at one end by corridors, by the Sir Julius Wernher reading-room, and by a block of buildings for administrative offices and for the rooms allotted to arts subjects and mathematics. This "arts" block also contains a large hall for public lectures.

In erecting these buildings the council has assumed a heavy responsibility, and in order to provide scholarships, to maintain the departments at a high level, and to keep up the fabric, an adequate endowment is urgently needed. An appeal has been issued for an endowment fund of 150,000*l.* A far humbler but very necessary appeal was also issued about a year ago for 2000*l.* to put the athletic clubs on a sound financial basis. The value of outdoor recreation to women coming from London homes, and engaged in severe mental work, can scarcely be over-estimated.

The Queen, who was accompanied by Princess Louise Duchess of Argyll and the Duke of Argyll, was received at the entrance of the college, and conducted by the Earl of Rosebery to the lecture-hall, where the council and staff were presented. She then proceeded to the two science blocks, where she inspected the students at work, and took the keenest interest in their experiments and exhibits. Afterwards she walked to the Tate Library, and then to the residents' block, where she visited some of the rooms. Meanwhile some 600 guests were awaiting her arrival in the dining-hall, the time being filled up by several speeches. The President of the Board of Education expressed strong appreciation of the work done by the college, and hopes of a great development of both school and university education in the future. In the absence of Sir John Simon, Miss Edgell (head of the department of philosophy) spoke next, and in an interesting speech outlined the progress of women's education during the last sixty years, and emphasised the great part played therein by the University of London. The Archdeacon of London pointed out the value of university education in the formation of national character. Then Lord Rosebery spoke until the Queen, having completed her tour of inspection, arrived in the hall, where she listened to a college song and received a bouquet from the students. She then said: "I have great pleasure in declaring the new buildings of this college open"; and left the college, after receiving thanks from Lord Haldane.

RUSSIAN GEOGRAPHICAL PAPERS.

Lake Balkhash.—Mr. B. F. Meffert, who visited this lake during a journey in Russian Asia in 1910, has given an account of its basin in the *Izvestiya* of the Imp. Russ. Geogr. Soc., Nos. i.-v., 1912. The basin is intimately connected with those of the lakes Sasyk-kul, Ala-kul, and Ebi-nor. The rocks are chiefly Palæozoic and eruptive rocks of various ages. Deposits dating no further back than the Tertiary are rare, and occur only in the eastern part of the basin. At some time or other before the Tertiary period the Palæozoic rocks were folded in various directions, chiefly north-west and west. When the faulting and upheavals which formed the horsts and troughs of the Tarbagatai, Dzungarian Alatau, the Chu-Ili watershed, &c., took place is not known, but