

ment or observation of any kind in the domain of this wonderful science which would not forcibly appeal to us. Some beautiful experiments with a vacuum tube concluded the lecture.

### UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

CAMBRIDGE.—The Observatory Syndicate have prepared a report with respect to the future work of the Cambridge Observatory.

They are of opinion that in the present condition of Astronomy provision must be made for photographic work, so that their inquiries have been directed to the discovery of the best scheme for rendering the Northumberland Equatorial available in connection with the project for a photographic establishment. The primary question as to the respective merits of reflectors and refractors for the photographic instrument had of course to be considered. On this issue there is considerable difference of opinion. For producing representations of astronomical objects, where great detail is required, reflectors are the most suitable. But where accurate measurement of the photographic plates is the object in view the balance of opinion seems clearly to show that the refractor is better adapted than the reflector. As it seems obvious that the work undertaken at the Cambridge Observatory should be based on accurate measurement the Syndicate have come to the conclusion that the refractor is the photographic telescope that should be employed. They think it right, however, to draw the attention of the University to the kindness of Mr. Common who offered to make and present to the Observatory a suitable silvered glass mirror if it were decided to employ the reflecting instrument.

It may be well to add that the Newall Telescope is devoted in the main to spectroscopic work and further that this instrument having been made for visual observation is not adapted to the special photographic work to which it is now proposed to direct the energies of the Observatory.

The scheme which the Syndicate suggest is that a new objective of eighteen inches aperture corrected for the photographic rays be provided; that the focal length of this should be about the same as that of the Northumberland objective, for which a new tube will be required; and that the two objectives, united as a pair like the present instruments at Greenwich and Oxford, should be erected on a new mounting, under a new dome, in the building at present occupied by the Northumberland Equatorial.

It will be observed that, by this scheme, the Northumberland objective will still be useful for every purpose for which it has been hitherto employed, with the great additional advantages of an excellent mounting and a good clock work. For example, such observations of comets as have been previously made here can be conducted under circumstances of much greater convenience than before. As to the special work to be undertaken by photography, it appears to the Syndicate that for the present under the particular conditions in which work here can be conducted there is no subject so promising as stellar parallax. The Director of the Observatory desires to undertake a systematic search with the aid of photography for stars which have measurable parallax, and of course so complete an apparatus as is now proposed would be available for many other researches besides that just suggested.

A preliminary estimate for the new telescope and mounting complete makes the cost £2450. To this must be added £500 for the new dome, and £150 for the measuring apparatus. If £100 be added for extras this makes a total of £3200. There is now a sum of about £1500 in the Special Sheepshanks Fund available for the purchase of instruments. In view of future contingencies, to exhaust the Sheepshanks Fund would be unadvisable and indeed it would not suffice for the purchase of an 18-inch equatorial. As such an instrument would contribute largely to the astronomical services of the Observatory the Syndicate think that an appeal to the public for subscriptions would probably be successful and such an appeal they are prepared to make.

It is therefore recommended that they be authorised to obtain estimates and plans for a new instrument as above described.

Dr. Hill, Master of Downing College, has been appointed a representative of the University at the International Medical Congress to be held at Rome next September.

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### SCIENTIFIC SERIALS.

*American Meteorological Journal*, May.—The following are the principal meteorological articles:—Meteorology as the physics of the atmosphere, by Prof. W. v. Bezold. This is a translation by Prof. C. Abbe of the first part of an important paper from *Himmel und Erde*. It describes the problems which at present are the subject of theoretical investigation, and points out what new problems have grown from looking at observational meteorology from a theoretical point of view. During the last decade attention has been chiefly devoted to the development of the so-called convection theory, which is principally based on observations at the earth's surface, but which, at higher elevations, is found to have defects. It has therefore become necessary to try and connect this theory with that of the old trade-wind theory, which for several decades has been entirely set aside. More attention is required to observations made in the higher regions of the atmosphere, together with the application to them of the principles of general mechanics, as well as of thermo-dynamics.—Charts of storm frequency, by Prof. Abbe. The author has plotted in a tabular form the number of storm centres that pass over each quadrangular degree between lat. 20° and 49° N., and long. 99° and 63° W., deduced from the tri-daily Signal Service charts, from March, 1871, to February, 1873. He states that the chart from which the table is prepared clearly shows that the storm tracks, which move from Alberta and Assiniboin south-eastward over the United States and then north-eastward towards the gulf of St. Lawrence, describe a system of parabolic curves whose tendency is to have a common point of intersection, and therefore a region of maximum storm frequency, in, or to the north-west of Nebraska.—Six and seven day weather periodicities, by H. H. Clayton. The author, who has studied the subjects of periodicities for several years, found a striking regularity between the intervals of many of the temperature maxima of the Blue Hill observations, and that almost all the maxima could be arranged in such a way that they followed each other at intervals of six or seven days. He thinks that, for a large part of the year, forecasts of temperature, on the assumption of regular rhythmic oscillations, and a knowledge of the time of their beginning and ending, may be made for a week or two in advance with nearly as much accuracy as they are now made by the Weather Bureau for thirty-six hours.

*American Journal of Mathematics*, vol. xv., No. 2. (Baltimore, April, 1893).—The opening memoir is one entitled "Hyperelliptische Schnittsysteme und Zusammenordnung der Algebraischen und Transcendenten Thetacharakteristiken," by H. D. Thompson (pp. 91–123). There are numerous figures and an index of contents.—On the determination of groups whose order is a power of a prime, by J. W. A. Young (pp. 124–178), considers in some detail groups of the order specified in extension of the work on groups by Cayley (*Am. J. of Math.*, vol. i.), Kempe (*Phil. Trans.*, vol. clxxvii.), Netto (Substitutionentheorie, pp. 133–7), and Kronecker. The author's aim has been "to presuppose no knowledge of the theory of groups on the part of the reader."—The third paper, the projection of four-fold figures upon a three-flat, by T. P. Hall (pp. 179–189), is an interesting contribution to the literature of higher space, and the last page (190) contains a note on a geometrical theorem by C. N. Little. It gives a property of a Pascal line, and a Brianchon point of 6 gons formed in a specified manner.

*Wiedemann's Annalen der Physik und Chemie*, No. 5.—On electrical discharges: production of electrical oscillations and their relation to discharge tubes, by H. Ebert and E. Wiedemann. This portion of the work investigates the manner in which the properties of the conducting circuit determine the sensibility of the discharge-tube when placed in a given position with regard to the terminal condenser. Among the conditions thus studied were the distance between the plates of the primary condenser, the D.P. in the primary spark-gap, and the frequency of the sparks; also the influence of bridges across the wire system, the D.P. required to make the tubes glow, and the effects of the presence of other glowing tubes in the field. As regards the last, it was found that if a glowing gas was present in a portion of the condenser field the distribution of energy was quite different from that in a homogeneous field; the tubes of energy were attracted towards the gas and passed through it, showing that the gas in the state of glow has a greater per-