

ammeter is adequate for the measurement of sustained tube currents, it is best to use some form of ballistic meter for currents lasting less than about a second.

Structure of Cellulose. One of the difficulties in correlating the physical and chemical properties of cellulose is the peculiar, almost self-contradictory, nature of this substance. Thus, the tensile strength of an artificial silk fibre may correspond weight for weight with that of a wire made from a light metal such as duralumin, although so far as transparency and conductivity of electricity and heat are concerned, cellulose has no semblance of metallic properties. A combination of X-ray and chemical methods will probably ultimately provide the explanation of these difficulties, and it is from this point of view that Prof. M. J. Duclaux describes the results of recent work on the subject in *La Papeterie* (Nos. 18 and 19; 1932).

The X-ray diagrams are best explained on the assumption that the greatest length of the cellobiose molecule is equal to that of the crystal lattice (10.3 Å.). This, in fact, is the foundation of the theory proposed by Mark and Meyer, namely, that the lattice takes the form of an oblique prism, and it involves the orientation of a cellobiose molecule at each corner and one joining the horizontal faces; two such molecules would then be common to each of four continuous lattices. Opposed to this is Staudinger's suggestion that the cellobiose molecules may form a long chain, and this is supported by the progressively increasing viscosity and decreasing solubility of chain complexes built up from simple molecules. One is left with the impression that the arguments in favour of each type of structure are equally potent, but that once the question of the length of the chains is settled a big step will have been taken in the direction of a solution of the problem.

Astronomical Topics

Occultation of Regulus on April 6. Extensive preparations were made to observe this occultation at stations near the northern boundary, which crossed England from Liverpool to Dover. Both in the neighbourhood of Canterbury and in that of Hitchin, parties of astronomers occupied posts about a mile apart along lines at right angles to the boundary; but clouds prevented any useful results from being obtained. The only time-observation to hand was made by Rev. O. Walkey at St. Buryan, Cornwall; long. $5^{\circ} 36' 18''$ W., lat. $50^{\circ} 4' 58''$ N.; in a letter to the *Morning Post* he gave the time of disappearance as $20^{\text{h}} 35^{\text{m}} 23^{\text{s}}$ U.T., but did not give the time of reappearance, though he stated that the star was hidden for 45^m, which is the maximum for any point in the British Isles. The phenomenon was seen as a spectacle from Worthing, but no times were recorded. It is worth while to remind the public that they can do useful work by timing the disappearance of stars, using the wireless time-signals to find the errors and rates of their clocks. The times must be given to seconds, and the position of the station determined from a large-scale ordnance map.

A Remarkable Short-Lived Nova. A photograph taken at Uccle by MM. Delporte and Arend on the evening of March 20 showed an image of a star of magnitude 13.2 (the first announcement gave mag. 11.0, but this was corrected to 13.2) of which no trace could be seen on earlier plates, one of which was taken in 1927, four in 1932 and one on March 18, 1933; this last showed stars to mag. 17.0. The position of the star for 1933.0 is $7^{\text{h}} 18^{\text{m}} 29^{\text{s}} \cdot 13^{\text{s}}$, N. $28^{\circ} 38' 1 \cdot 7''$. The following further observations were made at Uccle on the evenings of the dates named: March 21, mag. 13.5; March 22, mag. 14.5; March 23, mag. 17.0; on March 24 it was invisible, but the observing conditions were bad (U.A.I. Circs. 430, 431, 432). Further information is contained in Harvard Cards 264 and 265; the star was not found on Harvard plates taken on March 17 and March 22, which show stars to mag. 12; but plates taken by Prof. G. van Biesbroeck with the 24-inch reflector at Yerkes show it of mag. 14.5 on March 23.17 U.T., and of mag. 16.5 on March 24.19 U.T. The rapid rise and fall is thus confirmed. The star would seem to belong to a different category from ordinary novæ; also long-period variables generally remain

at maximum for several days. The region should be scrutinised from time to time in case of a reappearance.

Report of the Director of Leyden Observatory for 1932. This report gives evidence of a large amount of valuable work carried out not only at Leyden but also at Johannesburg, at an equatorial station in Kenya, and at the Perkins Observatory in Ohio. At the latter station Dr. Oort received permission to take a number of plates of extragalactic nebulae with the new 69-inch reflector; these are to study the surface luminosity and the distribution of light in different portions. The observers at the Perkins Observatory have promised to continue the series; the plates will be measured at Leyden. The work of Dr. Hins and Mr. van Herk in Kenya is nearly completed. Its object is to obtain fundamental declinations by observations of the azimuths of stars when they are moving vertically in the east and west. The results should be free from the uncertainty due to refraction. The time spent at the station was too short to give a complete catalogue of fundamental declinations; all that was aimed at was to give a full test to the possibilities of the method, in the hope that it may be carried out on a larger scale.

Plates for the determination of proper motions in the Pleiades continue to be taken under the direction of Prof. Hertzsprung; Mr. Uitterdijk examined the proper motion of the star 190 in the cluster N.G.C. 1647; it was suspected that this was a white dwarf accidentally superposed on the cluster, but the observations show no appreciable relative motion, so that it belongs to the cluster and is not a dwarf.

Several members of the staff went to America for last year's solar eclipse and the meeting of the International Astronomical Union at Harvard; Prof. Hertzsprung took advantage of his visit to Harvard to obtain estimates of the magnitude of variable stars from the immense series of plates that are now rendered easy of access by the new buildings erected for them. A 16-inch equatorial is being constructed for the observatory by the firm of Sir Howard Grubb, Parsons and Co. This will be erected in the grounds of the Union Observatory, Johannesburg, by kind permission of the latter, which has for many years been carrying on a scheme of joint work with Leyden.