Velocity of Light in a Magnetic Field.—It has been established with considerable accuracy by C. C. Farr and C. J. Banwell (*Proc. Roy. Soc.*, August) that the velocity of light in a vacuum of approximately one hundredth of a millimetre of mercury is unaffected by a transverse magnetic field. The optical system employed was a Jamin interferometer, in which the light paths were in fields of different strengths, one very small and the other of the order of 20,000 gauss. The whole apparatus was set up so as to minimise spurious shifts of the fringes, the position of which was watched by a number of observers as the field was established and switched off. The sensitivity of the apparatus was such that a relative change in speed of 1 part in 2×10^7 could have been apparent. By working with polarised light it was further shown that it was immaterial whether the direction of vibration lay in or at right angles to the applied magnetic field.

Diamagnetism of Bismuth.—Bismuth, which has always been of interest from its generally anomalous physical properties, has been the subject of much study recently in the form of single crystals. Goetz has confirmed in this way very strikingly the presence of an intermediate structure between the atomic lattice and the macroscopic crystals, giving for the average size of the discontinuities with which it is associated a few thousandths of a millimetre. In the April number of the *Indian Journal of Physics* it is pointed out by S. M. Rao that the existence of these sub-units of structure is in accord with the magnetic properties of the substance. Bismuth is diamagnetic, but the susceptibility depends upon the size of the particles used. Colloidal bismuth, when melted and recrystallised, shows an increase of up to thirty per cent in susceptibility, the change persisting even when allowance is made for contamination with oxide. The change of susceptibility with particle diameter is small for particles greater than about 1μ in diameter, but below this size falls off rapidly to the lower values, and for the smallest particles considered is still decreasing. The change in susceptibility thus occurs from about the particle size associated from other experiments with the mosaic structure, and affords confirmatory evidence for the reality of this.

Astronomical Topics

The Lunar Eclipse of Sept. 14—This was the first lunar eclipse of considerable size that was observable in London under clear skies for a good many years. Lunar eclipses are of interest from the fact that they give a good idea of the general state of the earth's atmosphere, or at least of the portions of it over the regions where the moon is on the horizon. The amount of illumination within the shadow varies to a notable extent. In 1884 the moon could be seen only with great difficulty, while in 1895 the maria and other surface markings could be observed with ease. The late eclipse did not attain either of these extremes, but was perhaps somewhat darker than the average eclipse. The limb was discernible in the telescope without difficulty at all the stages of the eclipse, also the crater Aristarchus, which is the brightest point of the disc. The outlines of the maria, however, were not easily seen until the maximum phase was nearly reached; *this is an effect of the darkening sky*; when there is bright sky light over the eclipsed region, contrasts are more difficult to detect.

The part of the disc that was nearest the centre of the shadow was coppery in tint, but the parts nearer the edge of the shadow tended rather to bluish grey. There was a specially bright region at the north-east limb of the moon. As the moon traversed the northern portion of the earth's shadow, there was not much opportunity to test whether the air in the southern hemisphere was rendered opaque by dust from the recent eruptions in the Andes. The southern region of the moon was carefully watched; it did not appear that there was any greater darkening there than that to be expected from deeper immersion in the shadow. The next total eclipse at which the moon will be high, in Great Britain, is on Nov. 7, 1938.

Capture of Comets by Planets.—The theory that all the comets of short period have had their orbits changed from parabolas to ellipses by near approaches to the great planets has been subjected to adverse criticism lately; in particular, Mr. S. Vsessviatsky, in the *Observatory* for May last, indicated many points in which the theory gave results that did not accord with observed facts. M. Jean Bosler contributed another paper on the subject to the *Journal les Observateurs* for January last. It examines what roportion of the comets that make close approaches to Jupiter would have their orbits transformed into ellipses and hyperbolas respectively. He finds that the ratio between the two is nearly one of equality, but with a slight preponderance for hyperbolas. This is clearly a further argument, though not a very strong one, against the theory; for it had already been shown that even if all the close approaches had led to elliptical orbits, there would not be enough to maintain the supply of short-period comets; reduction of the number of ellipses by more than half would render the insufficiency still more marked

It is not, of course, denied that such approaches may at times take place; but merely that they are insufficient to explain the large family of short-period comets. In fact, a case seems to have taken place recently; Ryves's comet, that was under observation a year ago, was shown to have approached Jupiter within a few million miles about a year earlier. A definitive orbit of Ryves's comet has not yet been computed; but those that are to hand make it somewhat probable that the orbit, after passing Jupiter, was hyperbolic.

A New Stellar Photometer.—Dr. W. H. Steavenson describes, in *Monthly Notices, R.A.S.*, for June, a simple form of photometer which has lately been inserted in his reflector. A plate of glass about a tenth of an inch thick is placed in the focal plane. Some small dents in its surface were made with a diamond, and illuminated by an electric bulb placed at the side of the tube, in the plane of the glass. The remaining light of the bulb is totally reflected in the plate, and does not reach the eye. The illuminated dents have a stellar appearance; their brightness can be adjusted by a rheostat to approximate equality with the star to be measured; the remaining difference is measured by a sliding wedge. The wedge projects beyond the eyepiece; *its position for equality of light* is recorded by marking on a card the distance of the end of the wedge from the tube, so that no artificial light is needed during the comparison. Ultimately the artificial star is compared with a known star in the north polar sequence. The different dents in the glass plate appear of different brightness, so that one can be selected near the magnitude of the object to be measured. Dr. Steavenson's extensive work on old novæ, etc., is well known. The new photometer should render the comparisons still more accurate.

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