Our Astronomical Column.

SATURN.—This planet is now very favourably situated for telescopic study. The luminous rings are now only slightly inclined, as seen from the earth, and present but a small extent of surface and detail. The ball, however, with its various dusky bands and bright zones of different intensities, will furnish interesting features under high magnifying powers. Occasionally, white spots and other irregularities are to be seen in the belts, and markings of this kind are important and should be utilised for redetermining the rotation period. Mr. W. F. Denning points out that Saturn is akin to Jupiter in presenting a number of surface currents which differ considerably in their relative velocities. In 1903 a number of light and dark spots became visible in the north temperate region of the planet, and these indicated a rotation period of 10 hours 37 minutes and 52 seconds.

Saturn will be in opposition to the sun on March 25, and situated at a distance of 794 millions of miles from the earth.

METEORIC FIREBALLS.—A magnificent fireball is described as having passed over the southern hemisphere on January 11 last. Its flight was witnessed from the Liverpool liner *Vauban*, which arrived at New York on February 20. The fireball is described as being as large as the full moon and moving very slowly from 10 degrees above the western horizon to the eastern horizon. It occupied three and a half minutes in its flight and all the while emitted a blaze of light sufficiently powerful to illumine the sea and ship in an extraordinary degree.

On February 17, at 11·32, a brilliant meteor was observed from many places, including London, Barnet (Herts), Stowmarket, Droitwich, and Scunthorpe, Lincolnshire. As seen from places not remote from the object it appeared to be many times brighter than Venus, and its flight was fortunately witnessed by several observers who apply themselves to celestial studies, including Mr. A. King, Mr. J. P. M. Prentice, Mr. A. N. Brown, Mr. Gheury de Bray, and others. Computation shows that the meteor had a radiant at about 125° +13° in Cancer, and that its height was from 62 to 29 miles from over Yarmouth to Winchester, Hants. Its luminous course extended over 41 miles and its velocity was 14 miles per second. It is remarkable how many fireballs displaying exceptional characteristics have appeared during the period from February 7 to 22 in different years.

COMPARISON OF SPEED OF BLUE AND YELLOW LIGHT.—*Harvard College Observatory Bull.* No. 763 contains an investigation of the difference in the times of the phases of the short-period variables in the globular cluster Messier 5 in Libra, as determined from photographic plates sensitised for blue and yellow light respectively. On the average the times were later in the blue light by 35 seconds, with a probable error of 70 seconds. The distance of the cluster was found by five different methods to be about forty thousand light-years, making it follow the Hercules cluster, Messier 13, as the second in nearness of those north of the equator. Accepting this distance, the speeds of blue and yellow light in the intermediate space do not differ by more than one part in ten thousand million as a maximum possible. Since any absorbing medium would cause the speeds to differ, this affords an upper limit to its amount.

THE ILLUMINATION OF THE ECLIPSED MOON.—The *B.A.A. Journal* for January contains an important article by L. Richardson discussing the action of the terrestrial atmosphere in refracting sunlight on to the eclipsed moon. Tables and diagrams indicate the amount of refraction of light at various heights above the earth. The values at heights of 0 km., 10 km., 20 km., 30 km., are 68′, 22′, 5′, and 1′ respectively; thus to reach the centre of the shadow the sunlight has to pass fairly near the earth's surface, and high mountains or clouds would intercept a good deal of it; an irregularity in the outline of the shadow in the eclipse of 1888 was plausibly attributed to cloud in the Amazon basin, or else to the Andes. The strange distortion that the sun would undergo to an observer on the moon is described.

The author deduces from theory that the centre of the shadow should be slightly brighter than the surrounding regions, and finds some support in the observations of May 1920. He constructed a model lens of concave section in printers' roller composition, with an opaque disc in the middle; when this was placed over a source of light, the brilliant ring could be seen round the dark disc, also the increase of illumination near the centre of the shadow. The bluish or greenish fringe often seen in the outer parts of the shadow is explained by stating that the sunlight that has passed high above the earth's surface would be much less reddened than that which passed low down. It is also pointed out that the varying distance of the moon from the earth is an important factor in altering the illumination in different eclipses. When the moon is in apogee it is further from the earth's "black shadow," and gets more light. After allowing for these factors, and for the mountain ranges that lie along the earth's terminator, the illumination of the moon should afford a useful index of the clearness of the zone of atmosphere that lies near the terminator.

PARALLAXES AND PROPER MOTIONS.—Mr. Van Maanen deals with this subject in *Contributions from Mt. Wilson Observatory*. No. 204 contains two important investigations, the first being a set of parallax determinations of specimen objects of various types made with the 60-inch reflector. The terms to reduce to absolute parallax have been derived from comparison with the spectroscopic parallaxes of Adams, etc. The mean parallax of 11 planetary nebulæ is of the order of 0·01″, the mean absolute magnitude is 8·4, and the mean diameter 0·06 light-year. Two Cepheids give small parallaxes of the same order as those found by Shapley from the proper motions; T Cassiopeiae, a long-period variable, has the considerable parallax 0·027″; its absolute magnitude varies from 3·9 to 9·7; two stars, Boss 500 and RR Lyræ, are notable for their high velocities, each about 200 km./sec., their absolute magnitudes being near 0; the value 0·019″ found for Nova Aquilæ is nearly the same as the accepted value for Nova Persei, 1901, while Campbell's hydrogen-envelope star (type O) and Boss 3322 (type N) are assigned parallaxes of 0·005″ and −0·002″. The radial velocity of the double cluster in Perseus is found to be −40 km./sec. and its proper motion +0·003″ in R.A. and +0·003″ in Decl. These values are so small that it is impossible to pick out cluster stars with certainty unless they are bright enough to permit their radial velocity to be determined. Tables are given of the individual motions and magnitudes of over 1500 stars.