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# POPULAR ASTRONOMY.

PLAINLY WORDED AND LARGELY UNTECHNICAL IN LANGUAGE. AMPLY ILLUSTRATED.

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Subscribers are reminded that volume VI begins with March number and ends with December 1898, and contains 10 numbers as usual. This publication will be issued every month during this calendar year. Subscriptions for the year can be secured if desired at a cost of \$3 00 for the 12 numbers.

**Mathematical Articles.**—Because of the importance of the matter treated, we have admitted into this issue several articles using the mathematics freely. It is to be hoped that this feature will not discourage popular readers. It ought not to do so. In connection with most of the equations there will be found popular statements of the results reached by the mathematics used. The popular reader needs to know these results. Now if such readers will go through the matter neglecting the mathematical formulæ which they do not understand, they will certainly get the points aimed at by the writers, which are the most important things to be learned. If methods by which results are obtained are long or difficult, most people must trust the scholars to do that part of the work. For all who have interest in useful results have neither time nor ability to prove everything in the range of needed knowledge.

**Measures of Sirius, Procyon and  $\beta$  395.**—In *Astronomical Journal* Mr. R. G. Aitken gives measures of these stars with the 36-inch telescope of Lick Observatory. The results of 4 nights' measures of Sirius and 3 of each of the other stars are as follows:

	Date,	Position Angle.	Distance.	
Sirius	1897.81	174.7	4.03	4 $n$
Procyon	1897.88	323.8	4.70	3 $n$
$\beta$ 395	1897.92	273.7	0.27	3 $n$

**New Asteroids.**—Three new asteroids were discovered on Dec. 18 by Charlois at Nice, France. They were all within an area of less than three degrees diameter.

	Mag.	Nice M. T.	R. A.	Degl.	Daily Motion.
		h m	h m s	° ' "	° ' "
DM	12	1897 Dec. 18 9 29.0	4 42 4	+ 18 0	- 48 - 10
DN	12.8	18 9 29.0	4 47 0	+ 20 44	- 48 - 1
DO	12	18 9 29.0	4 53 28	+ 19 21	- 56 0

**J. M. Hadley**, of Flower Observatory, University of Pennsylvania, Philadelphia, requests that any unpublished observations of Comet  $\zeta$  1896 (VII) discovered by Mr. C. D. Perrine be made public or sent to him at an early date.

**Brilliant Meteor.** Monday, November twenty-ninth, at ten minutes past eight in the evening, three people saw a large meteor. It was circular, fully one-fourth the apparent size of the full moon, at first white, changing to a flaming red as it vanished, leaving a bright red, green and blue train.

The path of the meteor seemed to be from the zenith, about the position of the  $\theta$  (theta) nebula in Andromeda, down toward the western horizon. The observers were going west and one said the meteor went northwest, one west, and the other southwest.

It passed south of Delphinus or "Job's Coffin," and vanished at about the upper northern edge of Aquarius. Total time to the disappearance of the train was about ten seconds. Total length of path, zenith to Aquarius,  $60^\circ$  to  $70^\circ$ . It

appeared to be three-fourths of the distance from the zenith to the horizon. The night was clear, with no perceptible haze. Latitude,  $40^{\circ} 6'$  longitude,  $89^{\circ}$ , Urbana, Ill., Dec. 23, 1897.

MARION E. SPARKS.

**Largest Telescope Reflector.**—The December *Popular Science News* reports that another great telescope is already approaching completion: In 1895, the Rev. D. John Peate commenced, at Greenville, Pa., the construction of a mammoth speculum for a reflecting telescope designed for the American University at Washington. After two years of arduous toil, Dr. Peate has given the great mirror its last touches—*i. e.*, in grinding and polishing, and it is ready for silvering, and for the futher and very important stage of mounting. The huge disc of glass is more than 61 inches in diameter.

**Variables of the Algol Type.** Dr. T. J. J. See has arrived at the result that the orbits of binary stars exhibit a tendency towards an eccentricity of about 0.5 consequently instead of assuming a circular orbit in the case of eclipse-variables we should, I apprehend, assume one with about this eccentricity. Without a third body in the system there might be no reason for a change in the position of the periastron similar to our "precession of the equinoxes." Your mathematical readers may perhaps take up the question, but it strikes me that such a precessional change might account for the small differences observed in the period:

I may however notice two other possible explanations. 1. Gravity is propagated in time and the effect of the time-propagation is greatest when the angular movement of the satellite is most rapid. 2. The orbit of the satellite, which eclipses the bright star periodically, is altering rapidly under the influence of tidal evolution—the pair of stars being comparatively close and both being in a liquid or gaseous condition. Careful observations ought to show in a comparatively short time whether either or both of these causes are at work. How far these two causes might produce identical results I am not competent to say, but I hope some of your able contributors will analyze the problem. How would a time propagation of gravity affect an eclipse-star of short period? W. H. S. MONCK.

Dublin, Ireland.

**New Paraboloid Speculum.**—I observe the interesting notice of the new diagonal paraboloid speculum devised by Dr. Lane Poor of Johns Hopkins University in last number of *POPULAR ASTRONOMY* upon which I would like to offer a few remarks.

At Dr. Poor's request I visited Johns Hopkins University in the early part of this year, among other things, for the purpose of assisting him in getting out a mirror of the description named in your paragraph on page 502, that is to say one that should be capable of depicting a regular optical image of an object situated at an angle of  $90^{\circ}$  to the line of vision, altho' nearly 25 years ago in the "*Engish Mechanic*," and more recently in "*Design and Work*." I had suggested some such a mirror. I never knew until my attention was called to an article in an English periodical 10 or 12 years ago, that any such mirror had been attempted—and I must say too, that the good Dr. was very reticent in regard to the purpose for which he intended to use the proposed mirror, leading me rather to believe that it was for something connected with photography; nor was it until some progress had been made in working the speculum that I was fully informed of the use to which it was to be put.