

generated is closed either with an ordinary cork or with an india-rubber stopper, and, with the object of arresting seleniuretted and sulphuretted hydrogen, the gas, as it passes from the flask to the mirror-tube, is brought in contact with lead acetate solution, sometimes bubbled through the liquid and sometimes passed through cotton-wool or over a roll of filter-paper saturated with the solution. Where cork has been in contact with arseniuretted hydrogen there is danger of sufficient of the arsenic compound being retained by this porous substance to render its continued use a possible source of error; with rubber there is always the chance that arsenic or antimony may be present as one of the constituents of the material, and as regards the use of lead acetate it has been urged that to bubble the gas through a small quantity of the solution is safer than to pass it through or over cotton-wool or filter-paper. The apparatus sent us has been designed to avoid the use of a cork or rubber stopper, and to include a convenient means of passing the gas through a minimum quantity of lead acetate solution. To a wide-necked flask of 200 c.c. capacity is fitted a hollow glass stopper, perforated by the gas-exit tube, which supports a bulb containing a small quantity of 10 per cent. acetate of lead solution. The stopper is ground to fit tightly into the neck of the flask, and as the gas passes up the exit-tube it bubbles through the lead acetate solution in the bulb and so on to a calcium chloride drying-tube, to which is attached the mirror-tube in which the arseniuretted hydrogen is decomposed. The apparatus is neat and effective.

THE additions to the Zoological Society's Gardens during the past week include three Derbian Wallabys (*Macropus derbianus*, ♂ ♀ and juv.) from Australia, presented by Captain Ben Jones; a Ring-tailed Coati (*Nasua rufa*) from South America, presented by Mr. Thomas Mackenzie; an Egyptian Jerboa (*Dipus aegyptius*) from North Africa, presented by Mr. J. Manuel; an Active Amazon (*Chrysotis agilis*) from Jamaica, presented by Mrs. V. A. Taylor; a Darwin's Rhea (*Rhea darwini*) from Patagonia, presented by Mr. H. F. Fox; a Large-billed Weaver-Bird (*Ploceus megarhynchus*, ♂) from Naini Tal, deposited; a Baya Weaver-Bird (*Ploceus baya*, ♂), two Black-throated Weaver-Birds (*Ploceus atrigularis*), a Black-headed Finch (*Munia malacca*), a Chestnut-bellied Finch (*Munia rubro-nigra*), two Hybrid Finches (between *Munia malacca* and *M. rubro-nigra*) from India, presented by Mr. Frank Finn; two Bennett's Wallabys (*Macropus bennetti*) from Tasmania, a Black Wallaby (*Macropus ualabatus*) from New South Wales, a Ring-necked Parrakeet (*Palaeornis torquata*) from India, an August Amazon (*Chrysotis augusta*) from Dominica, fourteen Algerian Skinks (*Eumeces algeriensis*) from North-west Africa, a Derbian Sternotherere (*Sternotherus derbianus*) from West Africa, three Simony's Lizards (*Lacerta simonyi*) from the Canaries, eight Three-streaked Skinks (*Mabuia trivittata*), two Streaked Skinks (*Mabuia vittata*), a Hissing Sand Snake (*Psammodphis sibilans*) from Syria, four Grey Monitors (*Varanus griseus*), five Common Skinks (*Scincus officinalis*), four Ocellated Sand Skinks (*Chalcides ocellatus*), six Turkish Geckos (*Hemidactylus mabouia*) from Western Asia, deposited; an Axis Deer (*Cervus axis*, ♂) from India, purchased; six Silver Pheasants (*Euplocamus nycthemerus*), four Gold Pheasants (*Thaumalea picta*), six Common Pheasants (*Phasianus colchicus*), bred in the Gardens.

#### OUR ASTRONOMICAL COLUMN.

##### ASTRONOMICAL OCCURRENCES IN JULY.

- July 1. 9h. Jupiter in conjunction with moon. Jupiter  $3^{\circ} 42' S.$   
 1. 19h. Saturn in conjunction with moon. Saturn  $3^{\circ} 36' S.$   
 2. 9h. 29m. to 9h. 47m. Moon occults B.A.C. 6710 (mag. 6.0).

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- July 3. 11h. 2m. to 14h. 6m. Transit of Jupiter's Sat. III.  
 5. 9h. Saturn in opposition to the sun.  
 15. Venus. Illuminated portion of disc = 0.936, of Mars = 0.900.  
 17. 10h. 34m. Minimum of Algol ( $\beta$  Persei).  
 22. 10h. 59m. Moon in conjunction with  $\alpha$  Virginis (Spica).  
 24. Saturn. Outer minor axis of outer ring =  $18'' \cdot 08$ .  
 28. 9h. 51m. to 11h. 6m. Moon occults 21 Sagittarii (mag. 4.9).  
 28. 11h. Jupiter in conjunction with moon. Jupiter  $3^{\circ} 37' S.$   
 29. 0h. Saturn in conjunction with moon. Saturn  $3^{\circ} 34' S.$   
 29. 8h. 33m. to 9h. 48m. Moon occults  $d$  Sagittarii (mag. 4.9).

BLACK SPOT ON JUPITER.—On June 2, Sig. J. Comas Sola, working at the observatory of Barcelona with a six-inch Grubb equatorial (power 200), noticed a strange marking on System II. of the planet's belts. From the time at which it passed the central meridian on that day its longitude would appear to be about  $\lambda = 73^{\circ} 1$ ; its latitude would be about  $15^{\circ}$ .

The tone of the spot is almost black, with a light garnet tinge, and might without close attention be mistaken for the shadow of a satellite. It is very sharp and circular, but on careful examination a very pale penumbra is seen before and behind the spot itself, the posterior penumbra being the more prominent of the two.

No signs of this spot were apparent on May 31.

TEN-YEAR GREENWICH STAR CATALOGUE FOR 1890.—The second ten-year star catalogue recently issued from the Royal Observatory forms Appendix II. to the *Greenwich Observations* for 1898, and contains the reduced places of 6892 stars for the epoch 1890.0, from observations made with the transit circle during the period 1887–1896.

The various corrections investigated are described at length, one interesting point brought out being that the observations from 1895–1899 show a diurnal change in the position of the nadir, the observations taken about noon and midnight giving positive corrections to the observations made near the time of sunset.

Comparisons are also given with the data of other standard catalogues, from some of which the proper motions of 174 stars are deduced.

NEW NEBULÆ.—In the *Comptes rendus* (vol. cxxxii. pp. 1465–1467) M. Bigourdan gives a descriptive table of twenty-one new nebulae discovered with the north-west equatorial of the Paris Observatory, bringing up the number found in this way to 392.

PARALLAX OF  $\mu$  CASSIOPEIÆ.—The eighteenth volume of "Contributions from the Observatory of Columbia University" contains an investigation of the parallax of  $\mu$  Cassiopeia, made by Mr. G. N. Baur from the Rutherford photographic measures of twenty-eight plates of the region taken during 1870–1873.

The final value determined for the parallax is

$$\pi = 0'' \cdot 238 \pm 0 \cdot 014.$$

A table is also included showing the positions of fifty-six of the neighbouring stars used in the determination.

#### NEGATIVE AFTER-IMAGES AND COLOUR-VISION.

FOUR years ago I described an apparatus by which apparent transformations of colour could be produced (*Proc. Roy. Soc.*, vol. lxi. p. 268; *NATURE*, vol. lvi. p. 128). The essential part of it is a disc, partly black and partly white, having an open sector at the junction of the black and white portions, as shown in Fig. 1. If such a disc is caused to turn five or six times in a second while its surface is strongly illuminated, a coloured object placed behind it and viewed intermittently through the opening generally appears to assume an entirely different hue, more or less approximately complementary to the true colour of the object. A piece of red ribbon, for example, is seen as bluish-green and a green one as pink. The effect is due to the formation of negative after-images upon the white portion of the disc.