

galerita) from Australia, presented by Miss Amy M. Dundas; three white-tailed Gaus (*Connochates gnu*, ♂ ♀ ♀) from South Africa, deposited; a Burchell's Zebra (*Equus burchelli*, ♀), two Silver-backed Foxes (*Canis chama*), a Cape Bucephalus (*Bucephalus capensis*) from South Africa, a Salvin's Amazon (*Chrysotis salvini*) from South America, purchased; four Upland Geese (*Bernicla magellanica*) from the Falkland Islands, received in exchange; four Coypus (*Myopotamus coypus*) born in the Gardens.

OUR ASTRONOMICAL COLUMN.

COMET HOLMES (1892 III.).—This comet has now become rather a difficult object, but the following ephemeris may be useful for those employing large instruments:—

12h. Paris Mean Time.		R.A. (app.)			Decl. (app.)	
1893.		h.	m.	s.	°	'
March 16	.....2	55	29	0	+ 35	27 53
17	.....	57	16	1		30 43
18	.....2	59	3	5		33 33
19	.....3	0	51	1		36 23
20	.....	2	38	9		39 13
21	.....	4	27	0		42 2
22	.....	6	15	3		44 51
23	.....3	8	3	8	35	47 40

THE SIZES OF JUPITER'S SATELLITES.—M. J. J. Landerer describes in the *Comptes Rendus* some experiments made to test the accuracy attainable in measuring the diameters of satellites by their shadows cast on the primary. He took a finely-ground glass plate and blackened it, leaving a space in the middle representing the appearance of Jupiter with its bands and small black spots representing shadows. He then placed it at a distance of 314 m., illuminated it by a suitable light from behind, and sketched the disc through the telescope used for the actual observations. With some practice it was found possible to draw such spots correctly to within one-tenth per cent. M. Landerer then applied his method to the satellites themselves, and found the following numbers for their radii:—0'0199, 0'0184, 0'0435, and 0'0419. The number of observations was twenty-six for the first satellite, seventeen for the second, thirty for the third, and twenty-two for the fourth. The commonly accepted numbers, obtained by micrometric measurements of the bright satellites, are 0'0291, 0'0259, 0'0431, and 0'0367.

OBSERVATIONS OF THE ZODIACAL LIGHT.—In No. 3155 of the *Astronomischen Nachrichten* Mr. Arthur Searle gives an account of the experimental work he and Prof. Bailey have been carrying on with respect to the best methods of making and recording observations of the zodiacal light. Owing to the prevalent use of electric light in the neighbourhood of Harvard College Observatory, the observations were made at some distance away. The general mode of defining the position of the zodiacal light up to the present has been by drawing its outline on a star atlas exactly as it appeared in the sky at the time of observation. The great drawback about this method is that in the majority of cases the zodiacal light has no definite outline, but gradually decreases in brightness as one recedes from the axis of the figure, eventually fading imperceptibly away. That this is so is the general idea and is backed up by observations, but it is also true that the contour, so to speak, of the luminous figure is sometimes sharper at some places than at others. Instead of outline drawings these observers have substituted contour lines in which the degree of light represented by each contour is stated; the latter is accomplished by selecting a portion of the sky "unaffected by the zodiacal light, but of equal brightness with those portions traversed by the contour line." This region would naturally lie near the Milky Way and its situation is defined by the stars in the vicinity. To complete the record the geographical position of the observer's station and the time of observation should be included in the statement. In addition to the contour lines two other suggestions are put forward, (1) that the axis of brightness should be indicated by a line, and (2) that should there be distinctly observed by any chance two cones of light, an outer and an inner, such a distinction should be shown in the record by drawing a boundary between them.

WEINEK'S LUNAR ENLARGEMENTS.—Since the appearance of the magnificent enlargements obtained by Dr. Weinek from the Lick Observatory negatives, many details of surface structure have been brought to light which have up till now evaded even the aided eye. These details, consisting as they do of winding rills, valleys, and hair-like markings, appear quite sharp and distinct in contrast with the larger surface features, and it is this fact that has caused some uncertainty about their being actual features on the lunar surface. Every one acquainted a little with photography knows that a photograph loses in sharpness the more it is enlarged, and it is here very curious to find a picture after being twenty times enlarged with minute details quite crisp and sharp, and the larger portions quite fluffy, as is the case in the enlargement of Vendelinus, taken on August 31, 1890. As Mr. Elger remarks (*Observatory*, March), "if these curious markings represent actual features on the moon's surface, ought they not to be easily seen in any good telescope that shows the formation and its principal details with far greater sharpness than the twenty-times enlarged negative, and many small craters, &c., in addition which are scarcely traceable upon it? One does not understand why this should not be so, unless these objects make an impression on the sensitive plate that they fail to do on the retina, which is hardly likely to be the case." M. Faye, in *Comptes Rendus* (No. 9) for March, when referring to these enlargements, says that several members, MM. Fizeau, Mascart, and Cornu included, reserved their opinions on the interpretation of these markings, which seemed to be the results of retouching. "Certain vermiculeous appearances," says he, "show a clearness which is strictly in contradiction with the very general 'estompée' appearance of the lunar cliché."

"L'ASTRONOMIE" FOR MARCH.—The March number of this magazine commences with some observations of Jupiter made at the observatories in Juvisy, Bruxelles, and in Spain during the past year. The numerous drawings which accompany the observations impress one with the incessant change that is taking place in the dense atmosphere, while the large red spot was as usual seen ploughing its way apparently through one of the dark belts. The period of rotation of this spot seems to have suffered a retardation during the last twelve months, as will be seen from the following table, which we take the liberty of producing here:—

h. m. s.			h. m. s.			
1879 ...	9	55	35	7	1886 ...	9 55 40
80 ...			35	0	87 ...	40
81 ...			36	1	88 ...	40
82 ...			37	2	89 ...	40
83 ...			38	1	90 ...	41
84 ...			39	2	91 ...	42
85 ...			40	1	92 ...	39

M. Guillaume, of the Lyons Observatory, contributes some interesting notes on the appearances of Saturn's rings during the same year, at which time it will be remembered we were lying nearly in its plane. Besides the drawings showing the general features of the planet, there are some illustrating the different degrees of luminosity observed at various parts of the ring itself. "The Circulation of Winds at the Surface of the Globe" is the title of an article by M. A. Duponchel, in which he gives as an introduction a brief historical account of the early hypotheses; while M. Flammarion gives us the fifth chapter on "Comment Arrivera la fin du Monde," dwelling for the most part on the destructive forces at work on the earth's surface.

BERMERSIDE OBSERVATORY.—In the advertising sheets of the *Observatory* for March we are sorry to see the following notice:— "On sale (the owner giving up astronomical work) the 3-foot Common reflector, with or without dome, complete, in perfect order. Mirror by Sir H. Grubb. Full particulars on application to J. Gledhill, Bermerside Observatory, Halifax."

GEOGRAPHICAL NOTES.

A TELEGRAM from Port Stanley announces the return of the Dundee whaling ships to the Falkland Islands (see NATURE, p. 282) on their way home. In the two months during which they were absent it is improbable that high latitudes were reached, but it is evident that a cargo was rapidly obtained, although it is not reported whether the species of whale hoped for was found.

THE Geographical Studentship at Oxford lately held by Mr. Grundy has been awarded to Mr. W. H. Cozens-Hardy, New