

Ayrton, F.R.S.; Experimental Mechanics, by Prof. Henrici F.R.S.; the Principles of Bread-making, by William Iago; Photography, by Capt. Abney, F.R.S.; Mathematical and Surveying Instruments, by Arthur Thomas Walmisley; Gas Manufacture, by Lewis T. Wright; the Application of Modern Geometry to the Cutting of Solids for Masonry and other Technical Arts, by Lawrence Harvey; and the Craft of the Carpenter, by John Slater.

THE additions to the Zoological Society's Gardens during the past week include two Long-eared Bats (*Plecotus auritus*), from Cornwall, presented by Mr. F. A. Allchin; a — Roe (*Capreolus* — ♀), from Corea, presented by Mr. F. Harston Eagles; two Burrowing Owls (*Speotyto cucularia*), from Buenos Ayres, presented by Mr. J. Clark Hawkshaw; a Blue and Yellow Macaw (*Ara ararauna*), from Para, presented by Mrs. Yarrow; two Crested Ducks (*Anas cristatus*), from the Falkland Islands, presented by Mr. F. E. Cobb, C.M.Z.S.; an Asp Viper (*Vipera aspis*), from Italy, presented by Messrs. Paul and Co.; a Common Viper (*Vipera berus*), from Burnham Beeches, presented by Mr. F. M. Oldham; two Japanese Deer (*Cervus sika* ♂ ♂), from Japan; a Macaque Monkey (*Macacus cynomolgus* ♂), from India, a Vulpine Phalanger (*Phalangista vulpina* ♂), from Australia, two Burrowing Owls (*Speotyto cucularia*), from Buenos Ayres, deposited; a Spotted Cay (*Calogenys paca*), born in the Gardens.

OUR ASTRONOMICAL COLUMN.

NEW MINOR PLANETS.—Herr Palisa, at Vienna, discovered a new minor planet, No. 276, on April 17, and M. Charlois, at Nice, discovered a second, No. 277, on May 3, the sixty-fourth and third discoveries respectively of the two astronomers. No. 273 has been named Atropos.

COMET 1888 a (SAWERTHAL).—The following ephemeris (*Dun Echt Circular*, No. 155) is in continuation of that given in NATURE, vol. xxxvii. p. 520 :—

For Greenwich Midnight.							
1888.	R.A.		Decl.		Log Δ .	Log r .	Bright- ness.
	h.	m.	°	'			
May 10	23	45	31	39.8 N.	0.2242	0.1003	0.14
12	23	50	32	33.7			
14	23	54	33	25.8	0.2360	0.1198	0.12
16	23	58	34	16.1			
18	0	2	35	4.7	0.2470	0.1386	0.11
20	0	5	35	51.7			
22	0	9	36	37.2	0.2572	0.1566	0.09
24	0	13	37	21.2			
26	0	16	38	3.9	0.2666	0.1738	0.08
28	0	20	38	45.3			
30	0	23	39	25.6	0.2752	0.1904	0.07

The brightness at discovery is taken as unity.

CINCINNATI ZONE CATALOGUE.—No. 9 of the Publications of the Cincinnati Observatory contains a zone catalogue of 4050 stars observed during 1885, 1886, and the early part of 1887 with the 3-inch transit instrument of the Observatory, made by Buff and Berger. The region covered by the zones is from S. Decl. 18° 50' to S. Decl. 22° 20', most of the stars down to mag. 8.5 having been observed, besides a considerable number of fainter ones. A low power was employed, so as to give a field of 50' in breadth, and as the zones were taken 15' apart, each star was thus usually observed in three zones. The R.A.'s were deduced from transits, recorded on a chronograph, over a system of five vertical wires; the declinations, from bisections by a micrometer wire, two readings being taken for each star whenever practicable. The probable error of a single observation was found to be R.A. $\pm 0.123s.$, Decl. $\pm 1''.84$, the observations being a little rougher than could have been desired, in consequence of the low magnifying power used. An important portion of the work has been the comparison of the resulting places with those for the same stars in earlier catalogues, and a considerable number of errata in Lalande's, Lamont's, and other catalogues have been detected. A list of

seventy-five proper motions, nearly all of them new, is likewise added.

PUBLICATIONS OF LICK OBSERVATORY.—The first volume of the Publications of the Lick Observatory has been received. It is chiefly occupied with the details of the progress of the institution from the date of Mr. Lick's first deed of trust, 1874, and with the description of the smaller instruments, the great refractor being reserved for a future volume. Meteorological observations taken on Mount Hamilton from 1880 to 1885, and reduction tables for the Observatory occupy a large part of the volume. Amongst the most interesting reports are those of Prof. Newcomb, on the glass for the great objective; of Mr. Burnham, on Mount Hamilton as an observing station; and of Prof. Todd, on the transit of Venus, 1882. A report on the structure of the mountain is also given by Profs. Irving and Jackson.

ASTRONOMICAL PHENOMENA FOR THE WEEK 1888 MAY 13-19.

(FOR the reckoning of time the civil day, commencing at Greenwich mean midnight, counting the hours on to 24, is here employed.)

At Greenwich on May 13

Sun rises, 4h. 12m.; souths, 11h. 56m. 9.7s.; sets, 19h. 40m.; right asc. on meridian, 3h. 22.8m.; decl. 18° 34' N. Sidereal Time at Sunset, 11h. 8m.
Moon (at First Quarter May 18, 23h.) rises, 5h. 58m.; souths, 13h. 54m.; sets, 21h. 57m.; right asc. on meridian, 5h. 21.2m.; decl. 19° 46' N.

Planet.	Rises.		Souths.		Sets.		Right asc. and declination on meridian.	
	h.	m.	h.	m.	h.	m.	h.	m.
Mercury..	4	16	12	8	20	0	3 34.8	19 50 N.
Venus....	3	45	10	54	18	3	2 20.6	12 38 N.
Mars.....	15	36	21	19	3	2*	12 46.9	4 6 S.
Jupiter....	20	21*	0	38	4	55	16 3.2	19 43 S.
Saturn....	8	51	16	47	0	43*	8 14.5	20 29 N.
Uranus... 15	44	21	23	3	2*	12	51.5	4 47 S.
Neptune..	4	41	12	24	20	7	3 50.7	18 28 N.

* Indicates that the rising is that of the preceding evening and the setting that of the following morning.

Occultations of Stars by the Moon (visible at Greenwich).

May.	Star.	Mag.	Disap.		Reap.	Corresponding angles from vertex to right for inverted image.
			h.	m.		
15	61 Geminorum..	6	21	48	near approach	212 —
16	d' Cancri...	6	23	5	23 45	74 337
May.	h.					
15	0	Mercury	at least distance from the Sun.			
16	22	Saturn	in conjunction with and 0° 42' north of the Moon.			

Variable Stars.

Star.	R.A.		Decl.		h. m.
	h.	m.	h.	m.	
U Cephei ...	0	52.4	81	16 N.	May 17, 1 38 m
ζ Geminorum ...	6	57.5	20	44 N.	15, 0 0 M
U Hydræ ...	10	32.0	12	48 S.	15, m
W Virginis ...	13	20.3	2	48 S.	17, 1 0 M
R Draconis ...	16	32.4	67	0 N.	14, m
U Ophiuchi ..	17	10.9	1	20 N.	18, 0 36 m
W Sagittarii ..	17	57.9	29	35 S.	17, 3 0 m
β Lyrae... ..	18	46.0	33	14 N.	17, 23 0 M
R Lyrae ...	18	51.9	43	48 N.	18, m
η Aquilæ ...	19	46.8	0	43 N.	19, 23 0 m
W Cygni ...	21	31.8	44	53 N.	18, M
δ Cephei ...	22	25.0	57	51 N.	15, 23 0 M

M signifies maximum; m minimum.

Meteor-Showers.

	R.A.	Decl.	
Near η Aquilæ ...	295	0	May 15. Very swift.
From Delphinus ...	314	15 N.	May 13-18. Very swift. Streaks.