which they are subjected. In contiguity to the tank is a miniature beach whereon the turtle rest when out of water. A consignment of turtle eggs is expected this week, which will be laid out in the hatchery on arrival for the purpose of incubation. Some West Indian tortoises have just arrived, together with a selection of snakes and lizards, which form interesting exhibits. In consequence of the inability of the Royal Commissioners to obtain Indian and Colonial fishes, the National Fish Culture Association have taken the matter into their own hands, and have made arrangements with the Zoological Society in Calcutta and other bodies for supplies of tropical and other piscatorial specimens, so that the aquarium will be supplemented with many rare and important specimens.

MR. OTIS T. MASON'S account of the valuable Guesne collection of antiquities in Point-à-Pitre, Guadaloupe, which appeared in the Smithsonian Report for 1884, has recently been issued in separate form. The collection originated with M. Mathieu Guesne, whose series of Carib stone implements attracted considerable attention at the Paris Exhibition of 1867. Since then it has been continued, and all but completed, by the son, M. Louis Guesne, who has devoted nearly twenty years of assiduous labour to the task of rescuing from destruction all existing relics of the ancient Carib race in the Island of Guadaloupe. He has also applied his artistic skill to the illustration of these objects, filling two large albums with aquarelles in natural size and colour of all the types in his museum. From these sources Mr. Mason has mainly compiled the present account, which is enriched with no less than 215 carefully prepared woodcuts of the Point-à-Pitre collection, and of a few others introduced for the purpose of comparison, and to supply omissions in West Indian archæology. The collection includes roughly-worked stones, indicating an industry in its infancy; and others so perfectly finished that it would be difficult to improve upon them either in design or workmanship. But all alike belong to what would be called the Neolithic period in Europe; all the stone implements are polished, and there is not a single object of this class formed solely by being chipped. In fact, the volcanic materials of which they are made cannot be worked by chipping, like flint, quartz, or obsidian. Some, especially, of the axes are so small that they seem to belong to a race of pigmies, while others are so large and heavy that they suggest a generation of Titans rather than of human beings. Besides the movable objects, mention is made of enormous stones carved with strange designs resembling those described by Mr. Im Thurn in British Guiana, some so high up as to be almost out of reach, others close to the ground or buried under the surface. Similar inscribed stones occur in the beds of rivers in the Island of St. Vincent, the last refuge of the Caribs in the West Indies.

HERR SCHÖYEN, in a paper recently reprinted from the *Transactions* of the Scientific Society of Christiania, describes a form of disease affecting the roots of growing barley, through which the farmers in Norway have of late years been suffering extensive loss. Contrary to the common opinion that the ravages due to this blight—which is popularly known as "Krog," crook, from the form of the deposits—were produced by an insect, Herr Schöyen maintains that this special barley-pest is a microscopic round worm, of the genus Tylenchus. After describing the appearance and character of the parasitic germs, which are deposited at the extremities of the roots, where their presence speedily manifests itself by the withering and death of the stalk before the grain can be set, he draws attention to the fact that similar deposits have been noticed on the roots of *Elymus arenaria*, the bind-grass so frequent on the Scotch, as well as the Norwegian, coasts. This observation derives special practical importance from the circumstance that at Lom, in Norway, where the barley crops have suffered most severely from the "Krog," the affected fields are in close vicinity to extensive tracts of *Elymus arenaria*. He proposes to continue his observations next summer with special reference to this point, but in the meanwhile he recommends as the only remedy available for the present that barley should not be re-sown on ground where the disease had manifested itself in the preceding season, nor in any locality where Elymus abounds. He finds that the bladder-like egg-cases of *Ty lenchus hordei* can be thoroughly desiccated without destroying the inclosed worms.

SOME interesting statistics of the Japanese press have lately been published in the *Oesterreichische Monatsschrift für den Orient*, in which the newspapers and periodicals of Japan are arranged according to the subjects with which they deal. It appears that 37 publications are devoted to matters connected with education, and that these have a total circulation of 42,649 per month. There are 7 medical papers, with a monthly circulation of 13,514; 9 relating to sanitary matters, with a circulation of 8195; 2 on forestry; and 2 on pharmacy. There are 7 devoted to various branches of science, with a circulation of 2528; but to these must be added 29 engaged in popularising science, with a total circulation of 70,666.

THE additions to the Zoological Society's Gardens during the past week include a Purple-faced Monkey (*Semnopithecus leucoprymnus* ♀) from Ceylon, presented by Mrs. Larkins; a Brazilian Tree Porcupine (*Sphingurus prehensilis*) from Brazil, presented by Mr. J. E. Wolfe; two Sloth Bears (*Melursus ursinus* ♂ ♀) from India, presented by Mr. H. Mainwaring; a Burmese Squirrel (*Sciurus atrodorsalis*) from Burmah, presented by Mr. C. Crofton Black; a West Indian Agouti (*Dasyprocta cristata*) from West Indies, presented by Dr. A. Boon, F.R.C.S.; an Orange-thighed Falcon (*Falco fusco-cærulescens*) from Chili, presented by Capt. W. M. F. Castle, R.N.; five Senegal Parrots (*Pæocephalus senegalus*) from West Africa, presented by Mr. R. B. Sheridan; two Kestrels (*Tinnunculus alaudarius*), British, presented by Mr. J. S. Malcolm; a Wedge-tailed Eagle (*Aquila audax*) from Australia, presented by Mr. R. B. Colvin; a Tuberculated Iguana (*Iguana tuberculata*) from West Indies, presented by Mr. D. Morris; seven European Tree Frogs (*Hyla arborea*), European, presented by Mr. Thompson Hudson; a Californian Quail (*Callipepla californica*) from California, a Herring Gull (*Larus argentatus*), British, presented by Miss Hodge; a Two-banded Monitor (*Varanus salvator*), two Rat Snakes (*Ptyas mucosa*), an Indian Cobra (*Naia tripudians*) from Ceylon, presented by Mr. Carl Hagenbeck; a Moorish Toad (*Bufo mauritanica*) from Italy, a Green Toad (*Bufo viridis*) from Malta, presented by Mr. Alban Doran, F.R.C.S.; two Greek Tortoises (*Testudo græca*), European, presented by Admiral Mellersh; two Common Vipers (*Vipera berus*), British, presented by Mrs. Mowatt; a Small Hill-Mynah (*Gracula religiosa*), from Southern India, deposited; a Hog Deer (*Cervus porcinus*), seven Long-fronted Gerbilles (*Gerbillus longifrons*), born in the Gardens.

OUR ASTRONOMICAL COLUMN

THE FLEXURE OF MERIDIAN INSTRUMENTS.—In a paper which forms Appendix III. to the "Washington Observations" for 1882, Prof. Harkness has made an exhaustive discussion of the subject of flexure, and the means available for eliminating its effects from star-places. He discusses separately the flexure of transit instruments and of vertical circles. The former are divided into two classes, according as their telescopes are straight or bent, but it is in the latter form that the effects of flexure are by far the greatest, the flexure-coefficients being in some instances as much as 0·55s. Prof. Harkness shows that the effect of flexure cannot be satisfactorily eliminated from the concluded right ascension of a star by simply taking the mean of the four results obtained by observing it directly and by reflec-

tion with the clamp of the instrument both west and east. It is better in his opinion to determine for each instrument the necessary corrections to be applied by means of the methods and formulæ explained in this paper.

In discussing the flexure of vertical circles Prof. Harkness compares Repsold's method of eliminating the flexure, by interchanging the object and eye-end of the telescope, with Bessel's method of attaining the same result by observing a star both directly and by reflection with the clamp successively west and east, demonstrating the superiority of the latter method, which appears to be the most satisfactory procedure hitherto devised for freeing an observed declination from the effect of flexure.

Prof. Harkness shows that when there are terms in the flexure depending on multiples of the zenith distance, they cannot in general be completely eliminated, and therefore that star-places derived from observations made with a single instrument are likely to be affected by systematic errors, which will appear when the work of different instruments is compared together. The detection and elimination of such errors can probably, Prof. Harkness thinks, be greatly facilitated by the use of equal altitude instruments of the zenith telescope class, which are so remarkably free from systematic errors.

THE SPECTRUM OF FABRY'S COMET.—M. Trépied having frequently observed the spectrum of this comet since April 7, gives (*Comptes rendus*, vol. cii., No. 18) the following account of it. The three usual cometary bands were seen, and as the brightness of the spectrum allowed a fairly narrow slit, 0·2 mm., to be used, the coincidence of these bands with those of the hydrocarbon spectrum could be very satisfactorily verified. Besides these bands there was also a continuous spectrum, but the remarkable feature of the case was that although the nucleus, which was very distinct and of a truly stellar appearance, appeared very bright as compared with the neighbouring portions of the coma, the band spectrum given by these latter and by the tail was much more brilliant than the continuous spectrum of the nucleus. This circumstance, which was also observed by MM. Thollon and Perrotin at Nice, had been remarked by M. Trépied in Encke's comet last year. He is therefore led to conclude that there is a predominance of gaseous elements in both these comets, and that, further, the relative brilliance of the nucleus of a comet is not necessarily in accord with the degree of condensation of the cometary matter.

On April 14 the bright bands could be easily detected in the spectrum of the tail to a distance of 20′ from the nucleus. The total length of the tail was then more than 3°.

TWO NEW COMETS.—Mr. W. H. Brooks, Red House Observatory, Phelps, New York, discovered two new comets in the last week of April, the first on April 27, the second on April 30. The former is described by M. Bigourdan as being on May 1 a round nebulous object, about 2′ in diameter, brighter towards the centre, but without a nucleus. The existence of a very faint nucleus was, however, suspected on the following night. On May 6 Lieut.-Col. Tupman estimated the comet as being of the 8th magnitude. Dr. H. Kreutz has computed the following elements and ephemeris for it:—

T = 1886 June 6·9585 Berlin M.T.

ω = 202° 55′·68
Ω = 191 48·58 } Mean Eq. 1886·0
i = 87 33·03
log q = 9·40752

Ephemeris for Berlin Midnight

1886	R.A. h. m. s.	Decl. ° ′	Log Δ	Brightness
May 13	2 9 38	51 43·7 N.	0·1062	2·2
17	2 30 25	47 52·2	0996	2·9
21	2 49 32	43 25·9	0931	4·1
25	3 7 48	38 17·2	0865	6·2
29	3 26 26	32 15·3 N.	0·0794	10·0

The brightness on April 29 is taken as unity.

The second comet is described (*Astr. Nach.* No. 2728) by the Baron von Engelhardt as being very bright on May 3, although the evening was misty. The comet was visible in a bright field, and showed a circular nucleus, from whence proceeded a brighter offshoot, 2′ in length, in the direction of the axis of the tail. The tail was 8′ in length and very bright, narrow at first, but broadening by degrees, and curved with the convex side towards the north. A secondary tail, 6′ in length, faint, and bending towards the south, forked off from the principal tail about 6′ from the nucleus. The following elements and ephemeris are by Dr. E. Lamp:—

T = 1886 May 4·13040 Berlin M.T.

ω = 37° 50′·15
Ω = 287 22·88 } Mean Eq. 1886·0.
i = 99 47·53
log q = 9·92518

Error of middle place ($O - C$).

$d\lambda$ = + 0′·19 $\quad$ $d\beta$ = − 0′·02

Ephemeris for Berlin Midnight

1886	R.A. h. m. s.	Decl. ° ′	Log r	Log Δ	Brightness
May 12	23 52 46	47 23·0 N.	9·9326	9·9924	1·0
14	0 5 38	51 23·8	9·9364	9·9980	0·9
16	0 20 38	55 10·5	9·9410	0·0056	0·9
18	0 38 9	58 39·8	9·9462	0·0149	0·8
20	0 58 38	61 49·5	9·9520	0·0255	0·8
22	1 22 15	64 35·6	9·9583	0·0373	0·7
24	1 49 21	66 55·8	9·9652	0·0501	0·6
26	2 19 47	68 48·4	9·9725	0·0636	0·5
28	2 52 55	70 11·7	9·9802	0·0775	0·5
30	3 27 37	71 5·8 N.	9·9881	0·0918	0·4

The brightness on April 30 is taken as unity.

NEW MINOR PLANET.—A new minor planet, No. 258, was discovered on May 4 by Dr. Luther at Dusseldorf, R.A. 15h. 20m., Decl. 9° 31′ S.; daily motion, R.A. − 48s., Decl. + 7′; mag. 11.

ASTRONOMICAL PHENOMENA FOR THE WEEK 1886 *MAY* 16-22

(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 16

Sun rises, 4h. 8m.; souths, 11h. 56m. 9·3s.; sets, 19h. 44m.; decl. on meridian, 19° 9′ N.: Sidereal Time at Sunset, 11h. 22m.

Moon (Full on May 18) rises, 17h. 51m.; souths, 23h. 5m.; sets, 4h. 10m.*; decl. on meridian, 11° 22′ S.

Planet	Rises h. m.	Souths h. m.	Sets h. m.	Decl. on meridian ° ′
Mercury ...	3 34	10 24	17 14	9 7 N.
Venus ...	2 48	9 4	15 20	2 29 N.
Mars ...	12 23	19 13	2 3*	8 57 N.
Jupiter...	13 52	20 10	2 28*	2 53 N.
Saturn ..	6 37	14 49	23 1	22 49 N.

* Indicates that the setting is that of the following morning.

Occultations of Stars by the Moon (visible at Greenwich)

May	Star	Mag.	Disap. h. m.	Reap. h. m.	Corresponding angles from vertex to right for inverted image ° °
17	η Libræ ...	6	22 16	23 32	64 240
19	24 Scorpii	5	0 37	near approach	167 —
21	*d* Sagittarii	5	22 1	22 57	19 266
22	B.A.C. 6658	6	5 2	near approach	206 —

Variable Stars

Star	R.A. h. m.	Decl. ° ′		h. m.	
ζ Geminorum ...	6 57·4	20 44 N.	May 20,	2 20	*m*
V Virginis ...	13 21·9	2 35 S.	,, 17,		*M*
δ Libræ ...	14 54·9	8 4 S.	,, 16,	2 8	*m*
U Ophiuchi ...	17 10·8	1 20 N.	,, 16,	0 44	*m*
			,, 21,	1 30	*m*
X Sagittarii...	17 40·4	27 47 S.	,, 19,	2 25	*m*
			,, 22,	0 0	*M*
W Sagittarii	17 57·8	29 35 S.	,, 21,	21 40	*M*
β Lyræ... ...	18 45·9	33 14 N.	,, 16,	0 0	*m*
S Vulpeculæ	19 43·7	27 0 N.	,, 17,		*m*
η Aquilæ ...	19 46·7	0 7 N.	,, 19,	0 0	*m*
δ Cephei ...	22 24·9	57 50 N.	,, 20,	21 35	*m*

M signifies maximum; *m* minimum.