

other half has twelve arcs of concentric circles drawn upon it. Each arc subtends an angle of forty-five degrees. In the first quadrant there are three such concentric arcs, in the next three more, and so on; the only difference being that the arcs are parts of circles of which the radii increase in arithmetical progression. Each quadrant thus contains a group of arcs differing in length from those of the other quadrants. The curious point is that when this disc is revolved, the impression of concentric circles of different colours is produced upon the retina. If the direction of rotation is reversed, the order of these tints is also reversed. The cause of these appearances does not appear to have been exactly worked out.

THE additions to the Zoological Society's Gardens during the past week include a Black Lemur (*Lemur macaco*, ♂) from Madagascar, presented by Mr. Roche; a Snowy Owl (*Nyctea scandiaca*), captured in mid-Atlantic, 700 miles from land, presented by Mr. Harston Eagle: two Levaillant's Cynictis (*Cynictis levaillanti*), two Domestic Sheep (*Ovis aries*, var.), two Puff Adders (*Vipera arietans*), a Cape Bucephalus (*Bucephalus capensis*), six Hispid Lizards (*Agama hispida*), five Rough-scaled Lizards (*Zonurus corydus*), a Delalande's Lizard (*Nucras delalandi*), a Crossed Snake (*Psammodphis crucifer*) from South Africa, two Bennett's Tree Kangaroos (*Dendrolagus bennethanus*) from North Queensland; an Allied Goshawk (*Astur approximans*), three Long-necked Chelodines (*Chelodina longicollis*), twenty-two Golden Tree Frogs (*Hyla aurea*), seventeen White's Tree Frogs (*Hyla cœrula*) from Australia, a Spix's Macaw (*Ara spixi*) from North Brazil, deposited; two Caroline Conures (*Conurus carolinensis*) from North America, purchased; two Queensland Tree Kangaroos (*Dendrolagus lumholtzi*, ♂ ♀) from Queensland; four Brush Turkeys (*Talegalla lathami*, 4 ♂) from Australia, received in exchange.

#### OUR ASTRONOMICAL COLUMN.

THE PARALLAX OF NEBULA  $\lambda$  2241.—At the time when Dr. Wilsing took photographs of the nebula B.D. + 41° 4004 for the determination of parallax, he obtained also a series of negatives of B.D. + 41° 4773 ( $\lambda$  2241) for the same purpose. This nebula is almost ring-shaped, and displays a central condensation. The latter appears more distinct on the photographic plates than can be seen by eye observations, and its contour is only sufficiently sharp for micrometric measurements on the best plates, so that the centre of the whole apparent disc has been generally used. From June 1892 to August of the following year, 33 plates were obtained, 31 of which have been used in this research. Six comparison stars, the positions of which were taken from the Bonn zones, have been adopted. In the account of the result obtained (*Astro. Nach.* No. 3261), Dr. Wilsing gives a table showing the deduced distances of the nebula from the two comparison stars 3 and 6. A second table contains the mean monthly values of these distances with their differences from the whole mean value obtained from all the measurements, together with the most probable errors of the measurements.

The following table shows these differences between the total and monthly means for the two stars 3 and 6:

	[N, 3]	[N, 6]	Prob. error.	No. of plates.
1892 June 21	... -0'03	... +0'28	... ±0'08	... 5
July 13	... +0'11	... +0'03	... 0'06	... 9
Aug. 9	... +0'07	... -0'04	... 0'13	... 2
Sept. 25	... +0'01	... -0'06	... 0'08	... 5
Oct. 4	... -0'13	... +0'01	... 0'13	... 2
Nov. 8	... +0'20	... +0'03	... 0'10	... 3
Dec. 22	... -0'53	... -0'44	... 0'18	... 1
1893 Feb. 4	... -0'13	... -0'34	... 0'18	... 1
July	... -0'08	... -0'19	... 0'13	... 2
Aug.	... -0'53	... -0'14	... 0'18	... 1

These differences, when considered in relation with the probable errors of the measurements, have as Dr. Wilsing

NO. 1309. VOL. 51]

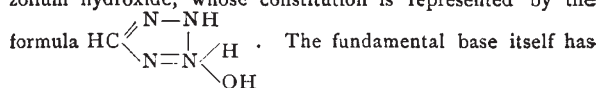
suggests, to be cautiously dealt with, and he is led to conclude from this series of measures that the relative parallax of this nebula does not exceed one or two tenths of a second of arc.

A POSSIBLE NEW ZONE OF ASTEROIDS.—The secular variations of the orbits of the four inner planets has lately occupied Prof. Newcomb's attention, with the result that several elements have been found to vary in a manner unaccounted for by existing theory. (*Astronomical Journal*, No. 327.) "These anomalies," says Prof. Newcomb, "cannot be simultaneously explained either by an intra-mercurial zone of planets, by the action of matter reflecting the zodiacal light, or by a deviation of gravitation from the usually accepted law. The uncertainty as to the mass of Mercury makes the construction even of a working hypothesis difficult; but apart from all considerations of probabilities, *à priori*, the hypothesis which best represents observations, is that of a ring of planetoids of small eccentricity a little outside the orbit of Mercury, and a little more inclined to the ecliptic. The total mass of the ring may range from one-fiftieth to, perhaps, one three-hundredth of the mass of Venus, according to its distance from Mercury." Prof. Newcomb intends to carefully investigate the matter in order "to decide whether the results of the hypothesis are such as to counterbalance its extreme improbability."

A NEW COMET.—*Edinburgh Circular*, No. 43, dated November 23, states that a telegram received from the Central Astronomical Station at Kiel announces the discovery of a very faint comet, by Mr. Edward Swift, at 8 p.m., Californian time, on the 20th inst. It was situated in Right Ascension, 22h. 18m. 24s., and South Declination, 13° 7', and was moving slowly towards the east.

#### A NEW SERIES OF NITROGEN COMPOUNDS.

ANOTHER new series of nitrogen compounds, containing four atoms of that element along with one atom of carbon in a closed chain, are described by Prof. v. Pechmann and Herr Runge in the current *Berichte*. They are termed "tetrazolium" compounds, and the parent base of the series is tetrazolium hydroxide, whose constitution is represented by the



not yet been isolated; the compounds prepared comprise the derivative in which the two hydrogen atoms directly attached to the two end nitrogen atoms are replaced by phenyl, together with a large number of salts of this base, formed by replacement of the hydroxyl by halogens or other acid radicles just as in the case of metallic hydroxides. The hydrogen atom attached to the carbon is likewise capable of replacement by many organic radicles, so that a large number of still more complicated bases have likewise been prepared, together with their corresponding salts. The hydroxides of this new series are characterised by possessing strong basic properties. They may all be prepared most conveniently from their chlorides, by the action upon them of silver oxide. They are extremely soluble in water, but are completely precipitated from their solutions by ether. The aqueous solutions absorb carbon dioxide and behave very much like caustic alkalis. They cannot, however, be crystallised, forming resins upon concentration. The salts, on the other hand, crystallise admirably; they are usually soluble in water, react neutral to litmus, and possess a very bitter taste. Diphenyl

tetrazolium chloride,  $\text{HC} \begin{array}{c} \diagup \text{N-NPh} \\ \diagdown \text{N} \\ \diagup \text{N} \\ \diagdown \text{N} \\ \diagup \text{Ph} \\ \diagdown \text{Cl} \end{array}$ , which may be taken as

a typical salt of the series, crystallises in colourless radiating groups of needles very sensitive to light, which renders them yellow. The aqueous solution yields a flesh-coloured precipitate of a chloroplatinate with platinum chloride, and the double salt may be crystallised from hot water. A crystalline double chloride is likewise produced with gold chloride. The addition of a soluble nitrate or iodide causes the precipitation of the difficultly soluble nitrate or iodide of the base. A solution of iodine in potassium iodide precipitates an iodine addition product, which can be crystallised from alcohol in beautiful brown tabular crystals exhibiting a violet reflection. The parent base is produced in solution upon the addition of silver oxide, silver