OUR ASTRONOMICAL COLUMN.

ASTRONOMICAL OCCURRENCES IN JUNE:—

June 6. 5h. 37m. to 9h. 20m. Transit of Jupiter's Sat. III. (Ganymede).
7. 4h. 24m. Conjunction of Mercury and Mars. Mercury 0° 19′ N.
„ 13h. 0m. Mercury at greatest elongation, 23° 58′ E.
13. 9h. 57m. to 13h. 39m. Transit of Jupiter's Sat. III. (Ganymede).
14. 10h. 13m. to 11h. 24m. Moon occults 4 Sagittarii (mag. 4·6).
19. 11h. 10m. Minimum of Algol (β Persei).
21. 8h. 19m. Sun enters Cancer and Summer commences.
22. 8h. 32m. Venus in conjunction with Mars, Venus 2° 4′ S.
28. Eclipse of the Sun partially visible at Greenwich. Begins 5h. 14m.; Middle 5h. 38m.; Ends 6h. 2m. Magnitude (Sun's diameter = 1) 0·065. At the time of greatest obscuration nearly one-fifteenth of the Sun's southern limb will be occulted.

THE RETURN OF ENCKE'S COMET.—A telegram from the Kiel Centralstelle announces that Encke's comet was found by Mr. Woodgate, of the Cape Observatory, on May 27. Its position at 17h. 49m. (Cape M.T.) on that date was R.A. = 2h. 59·3m., dec. = 7° 29′ S. This is situated about half a degree north of ρ Eridani, and is, at present, unobservable in these latitudes.

THE RADIAL VELOCITY OF ALGOL.—No. 22, vol. ii., of the *Mitteilungen der Nikolai-Hauptsternwarte zu Pulkowo* contains a very full discussion by Prof. Belopolsky of the radial-velocity observations of Algol made at the Pulkowa Observatory during the years 1905–7. The results obtained from each line on each spectrogram are discussed in detail, and the following elements are finally derived:— ω 42°·5 ± 1°·35, e = 0·0476 ± 0·0037, T = 2·509 ± 0·00019 days, a = 1,693,523 ± 106 km., and i = 90°.

THE RADIAL VELOCITY OF ε URSÆ MAJORIS.—From two spectrograms obtained at Potsdam in 1889, Profs. Vogel and Scheiner found the radial velocity of ε Ursæ Majoris to be −30·4 km., the measurements being made on the Hγ line. But from nine very consistent plates, secured with the Bruce spectrograph in 1902–3, Prof. Adams derived the value −9·4 km., and in 1903 this was confirmed by measurements of seven plates obtained at Potsdam, the mean value being −9 km. Vogel and Eberhard then re-measured the original plates, and confirmed the first value. The comparison of these results suggested that, possibly, the radial velocity of ε Ursæ Majoris is variable. That the star is of peculiar interest is shown by the fact that its spectrum is given as type I. *a* 2 in Vogel's classification, as VIII. P. in the Harvard classification, and that Sir Norman Lockyer, whilst classing it as "Sirian," has pointed out that it has several well-marked peculiarities.

For these reasons Messrs. Baker and Schlesinger, of Allegheny Observatory, obtained—during March and April, 1907—and the former measured, seven spectrograms taken with the Mellon spectrograph, which gives a measurable spectrum of 21 mm. in length between λ 3925 and λ 4750. The resulting mean value was −7·1 km. ± 0·46 km., and as this agrees so closely with that obtained by Prof. Adams and with the later value of Prof. Vogel, the matter must still be considered as requiring further investigation (Publications of the Allegheny Observatory, vol. i., No. 4, p. 23).

OBSERVATIONS OF JUPITER'S SATELLITES.—Some interesting observations of eclipses and occultations of Jupiter's satellites are recorded by M. S. Kostinsky in No. 4249 of the *Astronomische Nachrichten* (p. 14, May 20). On April 3 photographic and visual observations of a partial eclipse of J. ii. by the shadow of J. i. were secured; the brightness of J. ii. was diminished about 0·3–0·4 magnitude according to the eye observations, and the minimum brightness occurred at 11h. 52·3m. (Pulkowa M.T.). On February 24 an occultation of the second satellite by the first was observed at 10h. 45·5m., and on March 27 and 30 two series of photographs of the second and third satellites were secured during their eclipse by the planet's shadow.

A partial eclipse of the second by the third satellite was observed by Herr Fauth at the Landstuhl Observatory at 8h. 17m. 55s. (M.E.T.) on February 20.

THE ORBIT OF α ANDROMEDÆ.—The following elements for the orbit of α Andromedæ are published by Mr. Baker in vol. i., No. 3, of the Publications of the Allegheny Observatory (pp. 17–22):—P = 96·67 days, e = 0·525, T = 1907 November 2·40, ω = 76°·21, K = 30·75 km., γ = −11·55 km., A = 34·60 km., B = 26·90 km., and $a \sin i$ = 34,790,000 km. The discussion of the orbit was based on the measures of eleven lines between λ 3933·789 and λ 4481·437 on ninety-four plates obtained with the Mellon (single-prism) spectrograph, and the results are compared with those previously obtained at the Lowell, Lick, and Potsdam observatories.

THE UNITED STATES NAVAL OBSERVATORY.—The annual report of the United States Naval Observatory for the fiscal year ending June 30, 1907, gives the usual data regarding the time-service, publications, &c., and a brief summary of the observations made with each set of instruments. The observation of each star in Sir David Gill's Zodiacal Catalogue of 2798 stars was nearly complete, but a few more observations remained to be made in the autumn of 1907. More than 3000 observations were made by different observers with the new self-registering transit micrometer installed in October, 1906, and the results again prove the efficiency of this instrument. Bad weather limited the number of photoheliograms obtained, records being secured on only 150 days; spots were shown on the negatives on 148 days. There are now 1455 solar negatives in hand, and in order to minimise the labour of reducing these it is proposed that a heliomicrometer, as devised by Prof. Hale, be installed.

ON THE SHAPES OF EGGS, AND THE CAUSES WHICH DETERMINE THEM.[1]

THE eggs of birds and all other hard-shelled eggs, such as those of the tortoise and the crocodile, are normally simple solids of revolution, but they differ greatly in form according to the configuration of the plane curve by the revolution of which the egg is, in a mathematical sense, generated. Some few eggs, such as those of the owl or of the tortoise, are spherical or very nearly so; a few, such as the grebe's or the cormorant's, are approximately elliptical, with symmetrical or nearly symmetrical ends; the great majority, like the hen's egg, are ovoid, a little blunter at one end than the other; and some, by an exaggeration of this lack of antero-posterior symmetry, are blunt at one end but characteristically pointed at the other, as is the case in the egg of the guillemot and puffin, the sandpiper, plover, and curlew.

Various theories, based upon the principles of natural selection, are current and are very generally accepted to account for these diversities of form. The pointed, conical egg of the guillemot is generally supposed to be an adaptation advantageous to the species in the circumstances under which the egg is laid; the pointed egg is less apt than a spherical one to roll off the narrow ledge of rock on which this bird lays its solitary egg, and the more pointed the egg so much the fitter and likelier is it to survive. The fact that the plover or the sandpiper, breeding in very different situations, lays eggs that are also conical elicits another explanation, to the effect that the conical form permits the many large eggs to be packed closely under the mother-bird. The round egg of the tortoise and the elongated egg of the crocodile have been supposed to be developed in conformity with the shape of the creature that has afterwards to be hatched therein. Whatever truth there be in these apparent adaptations to existing circumstances, it is only by a very hasty logic that we can accept them as a *vera causa* or adequate explanation of the facts; and it is obvious to my mind that, in attempting to deal with the forms assumed by matter, whether in the organic or the inorganic world, we ought first to attempt to deal on simple physical lines with the forces to which it has been subjected, that is to say, the intrinsic forces of growth

[1] A paper read before the Zoological Society of London on April 28 by Prof. D'Arcy Wentworth Thompson, C.B.