

as follows:—Bessel 3501'6, Leverrier 3529'6, Meyer 3487'45, and Prof. Hall, from the motion of Iapetus, 3481'3 ± 0'54.

Prof. Hall carefully searched for additional satellites moving in the remarkable gaps between Rhea and Titan, and Hyperion and Iapetus, but without result.

STELLAR PARALLAX.—The second Appendix to the Washington Observations for 1883, contains a second memoir by Prof. Asaph Hall, not less interesting and valuable than the above. It will be remembered that Prof. Hall published a volume in 1882, containing determinations of the parallaxes of Vega and 61 Cygni from observations made by himself with the great 26-inch refractor at the Washington Observatory. Prof. Peters, of Clinton, U.S.A., has since pointed out to Prof. Hall that the temperature correction to his observations had been applied with the wrong sign. Prof. Hall has therefore now reduced his observations afresh, and given a new solution of the equations of condition. For 61 Cygni, Prof. Hall now finds a parallax of $0''\cdot270 \pm 0\ 0101$ from 101 observations extending from October 24, 1880, to January 26, 1886. This value is notably smaller than he obtained before, viz. $0''\cdot4783$, or than most other investigators have deduced. Thus Sir R. S. Ball had found $0''\cdot4756$, Auwers $0''\cdot564$, and Struve, Woldstedt, and others values closely according. Prof. Hall appears, however, satisfied with his results, and it should be remembered that Dr. C. A. F. Peters obtained $0''\cdot349$ for his absolute value of the parallax, the others being only relative parallaxes. Prof. Hall's value for Vega is also rather small, viz. $+0''\cdot134 \pm 0\ 0055$ from 128 observations, but agrees very much better with other modern determinations; Brünnow in 1869 from the same comparison-star, but by measures of distance and position, and not of differences of declination only, having obtained $\pi = 0''\cdot212 \pm 0''\cdot0098$. Prof. Hall also attacked the parallax of two other stars, 6 (Bode) Cygni, the parallax of which has recently been determined at Dunsink, being one, and the curious star 40 (δ^2) Eridani the other. For the former he finds a negative value, whereas Sir R. S. Ball gave $\pi = +0''\cdot422 \pm 0''\cdot054$, but only as a "merely provisional" value. The parallax obtained for 40 Eridani, $\pi = +0''\cdot223 \pm 0''\cdot0202$ is in fairly close agreement with Dr. Gill's, viz. $\pi = 0''\cdot166$. In the early part of this important paper Prof. Hall gives a full discussion, in his usual thorough and painstaking manner, of the value of a revolution of the micrometer-screw employed in the observations.

ASTRONOMICAL PRIZES OF THE ACADEMY OF SCIENCES. The Paris Académie des Sciences have decreed the Lalande Prize to M. O. Backlund for his labours on the motion of Encke's comet; the Valz Prize to M. Bigourdan for his researches on personality in the observation of double stars; and the Damoiseau Prize, for the revision of the theory of the satellites of Jupiter, to M. Soullart, with an *encouragement* to M. Obrecht of a thousand francs from the Damoiseau fund.

ASTRONOMICAL PHENOMENA FOR THE WEEK 1887 JANUARY 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 January 16

Sun rises, 8h. 1m.; souths, 12h. 9m. 58'8s.; sets, 16h. 19m.; decl. on meridian, 20° 56' S.; Sidereal Time at Sunset, oh. 2m.

Moon (at Last Quarter) rises, 23h. 47m.*; souths, 5h. 41m.; sets, 11h. 24m.; decl. on meridian, 4° 14' S.

Planet	Rises h. m.	Souths h. m.	Sets h. m.	Decl. on meridian
Mercury ...	7 23 ...	11 13 ...	15 3 ...	23 55 S.
Venus ...	8 39 ...	12 55 ...	17 11 ...	19 54 S.
Mars ...	9 4 ...	13 42 ...	18 20 ...	16 24 S.
Jupiter...	1 23 ...	6 27 ...	11 31 ...	11 42 S.
Saturn...	15 29 ...	23 35 ...	7 41* ...	22 I 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)

Jan.	Star	Mag.	Disap.	Reap.	Corresponding angles from vertex to right for inverted image
16 ...	65 Virginis	6 ...	2 5 ...	3 5 ...	61 193
16 ...	66 Virginis	6 ...	2 48 ...	3 57 ...	44 221
16 ...	l ² Virginis	5 ...	7 44 ...	8 35 ...	44 318

Jan.	h.
16 ...	21	Mars at least distance from the Sun.	
17 ...	3	Jupiter in conjunction with and 3° 40' south of the Moon.	
17 ...	4	Mercury at greatest distance from the Sun.	

Variable Stars

Star	R.A.	Decl.	h.	m.
U Cephei ...	0 52'3 ...	81 16 N. ...	Jan. 16,	23 2 m
Algol ...	3 0'8 ...	40 31 N. ...	16,	2 41 m
and at intervals of 2 20 48				
λ Tauri ...	3 54'4 ...	12 10 N. ...	Jan. 16,	22 48 m
δ Libræ ...	14 54'9 ...	8 4 S. ...	20,	21 41 m
U Coronæ ...	15 13'6 ...	32 4 N. ...	20,	2 42 m
W Herculis...	16 31'2 ...	37 34 N. ...	18,	m
U Ophiuchi...	17 10'8 ...	1 20 N. ...	20,	2 44 m
and at intervals of 20 8				
β Lyræ...	18 45'9 ...	33 14 N. ...	Jan. 22,	21 0 m ₂
δ Cephei ...	22 25'0 ...	57 50 N. ...	18,	23 0 M

M signifies maximum; m minimum; m₂ secondary minimum.

Meteor-Showers

Near γ Orionis, R.A. 72°, Decl. 4° N. From Coma Berenices, R.A. 181°, Decl. 35° N.; swift streak-bearing meteors. Near χ Cygni, R.A. 295°, Decl. 53° N.; somewhat slow meteors.

GEOGRAPHICAL NOTES

THE opinions of Dr. Junker, who is now in Cairo, as to the best route by which to reach Emin Pasha do not help us much. Indeed, Dr. Junker does not commit himself further than to suggest that by the shortest route, through Masai Land, there would be difficulties as to food. Not more, we are inclined to think, than by any other route. Mr. Thomson passed through the country at an exceptionally bad time, when the cattle of the Masai were dying by hundreds from disease. The country is one of the richest game regions in Africa, and by any route an expedition must, as far as possible, be independent of local supplies. For an expedition of hundreds of men to attempt to cross the Victoria Nyanza in boats would be extremely hazardous. Meantime it is evident both from what Dr. Junker says and from the letter of Mr. Ashe, who has just returned from Uganda, that Emin Pasha is in an exceedingly perilous condition, and that every week's delay risks his life and the lives of those who are with him, for he has no ammunition. We hear, on good authority, that Mr. Stanley has decided to go by the Masai Land route; if so, it seems a pity that the only white man who has explored this route will not be in the expedition.

It is said that great administrative changes are about to be made in Russian Central Asia. According to the St. Petersburg Correspondent of the *Times*, the whole system of arbitrary military mixed with native government, formerly considered necessary for high political purposes of further conquest, is to be gradually modified and almost abolished by the introduction of Russian civil administration and justice, and the subordination of the various departments to the Ministers in St. Petersburg. There is a proposal that Turkestan and the new Transcaspian province should be amalgamated, the reason alleged being that they will be closely connected by the Transcaspian railway, which, after passing through Bokhara, will terminate at Tashkend. The Transcaspian province will therefore, it is considered, be nearer to Turkestan than to the Caucasus. The scheme is said to have been suggested by General Rosenbach, the Governor-General at Tashkend. It is opposed by General Shepeleff, Director of the Chancery of the Governor-General of the Caucasus, who is of opinion that it would be highly inconvenient to remove the Transcaspian further from the control of the central Government, and that, if alterations are considered necessary, it would be better to make the newly-acquired territory an independent province.

ACCORDING to the *Novoe Vremya*, the trading caravan lately despatched by the Central Asian Commercial Company Koudrine has passed through Kashgar and entered Tibet. This company is likely to play an important part in Central Asia. It has established permanent agencies at Merv and Askabad and in the Persian cities of Kutchan and Meshed, and now it proposes to do the like in Tibet. It has received from the Ameer of