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Rev. R. MAIN, Vice-President, in the Chair.

Arthur Cayley, Esq. F.R.S., 2 Stone Buildings, Lincoln's Inn;
Rev. W. H. Drew, Blackheath, Proprietary School; and
J. J. Sylvester, Esq., 26 Lincoln's Inn Fields,

were balloted for and duly elected Fellows of the Society.

Note on the Eclipses of Agathocles, Larissa, and Thales. By the Astronomer Royal.

The Astronomer Royal has been enabled, by the kindness of Professor Hansen, to make an important addition to his investigations on the eclipses of Agathocles, Larissa, and Thales. Professor Hansen having computed, from the same tables which were adopted as fundamental in the preceding inquiry, the path of the shadow in the eclipse at Stiklastad, the Astronomer Royal has combined it with the eclipse at Larissa, and finds from this combination that Professor Hansen's coefficient of secular acceleration must be increased by a quantity differing little from $0''{\cdot}755$. The argument of latitude must also be increased by $45''$ nearly multiplied into the number of centuries anterior to 1800. The four eclipses are thus brought into perfect harmony. Professor Hansen's coefficient of tropical secular acceleration is $13''{\cdot}301$, including $1''{\cdot}121$ due to the secular acceleration of precession of the equinoxes. By the increase above mentioned, the coefficient of tropical secular acceleration is raised to $14''{\cdot}056$, and that of sidereal secular acceleration to $12''{\cdot}935$.

Observations in the Saturnian System. By Capt. W. S. Jacob.

"I beg to submit to the notice of the Society a portion of the results of my observations on the Saturnian System. Those of *Titan* have been reduced, numbering 67 sets of measures of angle, and 54 of distance. Of these latter 20 were taken within 15° (in longitude) of elongation, and will be proper for determining the value of the semi-major axis; but 3 of them were taken with the old micrometer furnished by Lerebours along with the instrument: a better one by Dollond being now generally em-

ployed, which is somewhat rickety, and should in my opinion be rejected; but it happens to be of little consequence to the result whether they are included or not. The following corrected elements have been deduced, those marked (A) from the angles alone, and those marked (A + D) from the angles and distances combined. The latter are, of course, the best; but the difference is very trifling. In the epochs the light equation is included; *i.e.* in employing them the light equation must be first deducted from the time of observation.

For 1857·00, Mean Time at Greenwich.

	A.	A + D.
	° ′	° ′
ε =	299 45·1	299 46·2
i =	27 36·7	27 36·0
Ω =	167 58·6	168 0·0
e =	·027996	·027953
π =	257°22′·4	256°51′·2

The orbit seems inclined to the plane of the ring by 36′, supposing Bessel's elements of the latter to be correct.

The following values of a^* have been deduced,—

No. (1) from the whole 54 measures;

No. (2) from the 20 elongations; and—

No. (3) from 17 elongations, rejecting the 3 suspected measures above alluded to.

(1)	176″·895
(2)	176·927 ± ·07
(3)	176·886 ± ·07

It is manifestly of little importance which of these be adopted as the true value; and we may safely take 176″·90 as being within less than 0″·1 of the truth. The mean motion may be considered as very exactly known, since my epoch differs by only 7′ from Bessel's. The error cannot, therefore, well exceed 0′·5 per annum, or $\frac{1}{1,000,000}$ of the whole; taking then the daily motion 22°·577008, the value of *Saturn's* mass will be = ·00028765 or $\frac{1}{3476\cdot4}$ if we adopt Bouvard's value of the mean distance, viz. 9·543301; or if we prefer Bessel's (9·542189), the value will be =·00028759 or $\frac{1}{3477\cdot1}$

These values are uncorrected for perturbations; but the effect of these must be very small; the ring and protuberant equator will tend to increase the apparent mass, while the solar attraction will diminish it. I shall be able to form a better judgment as to whether the *balance* of effect is sensible or not, when the observations of the remaining satellites have been reduced.

* Semi-major axis reduced to *Saturn's* mean distance.

The details of these observations will be printed hereafter; but I thought an abstract of the results might be interesting in the meantime.

I should mention that the value of the micrometer scale has been very well determined; last year I made another attempt to ascertain the temperature-coefficient, but failed for want of a sufficient range of temperature; the resulting values of one revolution were—

	Temp.
$23''.2682 \pm .0029$	70°.7
$23''.2649 \pm .0049$	89°.9
Mean $23''.2665 \pm .0029$	80°.3

The temperature-correction should have had the opposite sign to that indicated by these observations; but the difference is accounted for by the amount of the probable error. The mean value must be pretty correct, and the temperature-correction is of no consequence here, as the temperature at the time of observation never differs more than a few degrees from 80. Any uncertainty of this kind could not well produce an error in *Titan's* elongation exceeding $0''.04$, and may therefore be considered insensible.

Observatory, Madras.

New Double Stars discovered by Mr. Alvan Clark, Boston, U.S.; with appended Remarks, by the Rev. W. R. Dawes.

No.	Designation.	R A	N P D	Mag.	Approx Dist.	Tel. of Discovery.	Date of Discovery.
		h m	°		″	Inch	
1	✱ Andromedæ	0 13 5	57 49	7, 7	0″.4	$7\frac{1}{8}$	Oct. 1856
2	95 Ceti	3 10·7	91 29	$5\frac{1}{2}$, 10	0·8	$7\frac{1}{2}$	20 Dec. 1853
3	Weisse's Bessel, vi. 109	6 4·3	94 38	$6\frac{1}{2}$, 9	1·1	$7\frac{1}{2}$	6 Feb. 1854
4	Weisse's Bessel, vi. 1291	6 42·2	104 59	6, 9	1·0	$4\frac{3}{4}$	17 Feb. 1852
5	8 Sextantis	9 45·1	97 24	6, $6\frac{1}{2}$	0·6	$4\frac{3}{4}$	7 April, 1852
6	✱ Corvi	12 0·3	109 32	6		$4\frac{3}{4}$	19 May, 1852
7	μ Herculis, B. & C.	17 40·6	62 11	$10\frac{1}{2}$, 11	1·8	$7\frac{3}{4}$	July, 1856
8	✱ Herculis	17 47·4	60 17	$8\frac{3}{4}$	0·3	$7\frac{3}{4}$	July, 1856
9	✱ Herculis	17 48·7	60 9	10, $10\frac{1}{2}$	1·1	$7\frac{3}{4}$	July, 1856
10	21 Sagittarii	18 16·4	110 37	5, 8	2·5		
11	Weisse's Bessel, xviii. 391	18 17 2	91 39	7, $7\frac{1}{4}$	0·5	$7\frac{1}{4}$	30 July, 1854
12	Weisse's Bessel, xix. 1273	19 50·6	92 38	$7\frac{1}{4}$, 8	0·9	$7\frac{1}{4}$	18 July, 1854