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Dr. Pearson's Practical Astronomy.

THE late Dr. Pearson bequeathed to the Society the stock of his *Introduction to Practical Astronomy* remaining unsold at his death. There are about 100 copies of the entire work, and 400 copies of the first volume, which contains the tables.

The Council have resolved to sell these at the following prices to fellows and associates of the Society :—

	£	s.	d.
The whole work, 2 vols. text, and 1 of plates	1	1	0
The 1st vol., containing all the tables	0	5	0

The price to non-members is double.

Copies are now ready, and it is desirable that they should be applied for soon. So many are already disposed of that it would not be prudent to risk any further delay.

*Discovery of a new Satellite of Saturn.** By W. Lassell, Esq.

“ In communicating to you the particulars attending the discovery of an eighth satellite of *Saturn*, I shall adopt the proper names proposed by Sir John Herschel for the seven hitherto known satellites, namely, *Mimas*, *Enceladus*, *Tethys*, *Dione*, *Rhea*, *Titan*, and *Japetus*, beginning with the closest, and proceeding in order of distance from their primary. The new satellite I have proposed, in conformity with this nomenclature, to call *Hyperion*.

“ On the 18th September, while surveying the planet in the twenty-foot equatoreal, and looking out for *Japetus*, (which I expected to find following the planet and not far from the plane of his ring,) I remarked *two* stars exactly in the line of the interior satellites. Not being certain at the time which of these was *Japetus* (although the nearer of the two certainly seemed too faint), I made a careful diagram of their positions with respect to *Saturn*, and also to some neighbouring fixed stars.

“ The next night, the 19th, proved fine, and I was astonished to find that the *two* stars had both moved away from the fixed stars to which they had been referred, and were still accompanying *Saturn*; the more distant of the two had also gone northward, in conformity with the orbital motion of *Japetus*, while the nearer and

* The new satellite was, it is said, discovered at the Observatory of Cambridge, U.S., on Sept. 16th, but no account has been received from Professor Bond.

fainter, remaining precisely in the line of the inferior satellites, appeared to have slightly approached the planet.

“A consideration of this appearance suggested the idea that the more distant was *Japetus*, and that the nearer and fainter must be a new satellite of *Saturn*. To verify the suspicion, I took differences of right ascension between each and a fixed star, and found that in $2^{\text{h}} 36^{\text{m}}$ the suspected satellite had moved westward $2^{\text{s}}.46$, and that in $1^{\text{h}} 24^{\text{m}}$ *Japetus* (the identification of which was now certain) had also moved westward $1^{\text{s}}.27$. It is true that these differences are somewhat greater than is consistent with the orbital motion of *Saturn*, yet perhaps not greater than is consistent with reasonable errors of observation during so short a period. Moreover, as the suspected new satellite was situated precisely in the line of the satellites interior to itself, I took micrometrical measurements of its situation at two epochs, four hours apart, and was satisfied that during that interval no perceptible change whatever took place in its position in the line of the satellites. As the motion of *Saturn* southwards in the same period amounted to $18''$, he must have left the suspected satellite obviously behind if it had been a fixed star. I could, therefore, now arrive at no other conclusion than that I had discovered a satellite hitherto undetected.

“I regret that since the 19th September the weather has been remarkably unfavourable. I obtained a good set of measures of the elongation of the satellite on the 21st, and two very hasty measures on the 22d, caught between clouds, which, with an *estimation* of its elongation on the 18th, are all the data I have hitherto obtained towards the determination of its period. Since the latter date the weather has been uniformly cloudy.

“If these observations should be thought worthy of being recorded until better can be obtained, they would stand thus:—

Sept. 18, Elongation east of <i>Saturn</i> (estimated by comparison with <i>Titan</i>)	}	4	'	20	''
21, Elongation, measured		3		54	
22, Ditto ditto		3		27	

“These observations would, I believe, be best satisfied by a period of about 24 days, which may at least serve as a guide in looking for the satellite. Its magnitude is very small,—perhaps not intrinsically so great as that of *Mimas*,—though it was much easier to see, on account of its greater distance from the planet.

“During this autumn I have twice been gratified with a sight of the whole seven satellites of *Saturn* at one time, viz. on the 19th August and on the 16th September, at $11^{\text{h}} 15^{\text{m}}$. The observations of the latter evening were very interesting. I first saw the planet a little before 10^{h} , when *Tethys* was behind the planet, and *Enceladus* and *Dione* absolutely in one. I immediately recognised *Mimas*, and in a very short time *Enceladus* emerged from conjunction with *Dione*, and then appeared with the latter as the most delicate double-star possible. At $11^{\text{h}} 30^{\text{m}}$ *Titan* had approached close up to the ball, and was apparently in contact with it. At

11^h 35^m it had become occulted. At 11^h 5^m I observed *Tethys* just emerging from behind the ball, and noticed that he emerged evidently *south* of the line joining the other satellites. As the present position of the ring requires that, if revolving in its plane, the satellite should appear rather to the *north* on its emergence, this fact seems to afford some evidence that the satellite does not revolve precisely in the plane of the ring. Moreover, at 11^h 50^m, when *Tethys* and *Mimas* formed an exquisitely delicate double-star, *Tethys* was still south of *Mimas*, although, as *Tethys* was receding from the planet and *Mimas* approaching it, the reverse ought to have been the case if the former really revolves in the plane of the ring.

“ At 10^h 5^m this evening (Sept. 16) *Mimas* was, as nearly as could be estimated, at his greatest elongation eastward; and on the 16th October, 1847, at 8^h 35^m, I observed him at or very near his greatest elongation westward. The interval elapsing amounts to 336.045 days; and supposing him to have made in that time 356.5 revolutions, 22^h 37^m 22^s.6 will be the period of one revolution.”

Extract of a Letter from Mr. Lassell.

“ I am happy to tell you that I have at length brought my polishing machine to do all that I ever hoped or purposed it should do. I had previously obtained very good surfaces with it, but they were obtained with some anxiety and uncertainty. I wished to be able to repolish a known good surface without hurting it, as well as to turn a bad one into a good one with certainty and expedition. This, I am happy to say, I can now do; and by certain rules, varying with the proportion of the focal length to the aperture, I can produce a parabolic surface which shall have the same focus in every part of its surface to the hundredth of an inch. The improvement in regularity of curve is not less than in the truth of its general form. I am about to make some experiments on the further shortening of focus, viz. a 12-inch metal of 7-feet focus, more, however, as a curiosity than for utility.”*

FLORA.

CAMBRIDGE.		Northumberland Equatoreal.				(Prof. Challis.)				
Greenwich		R.A.		Obs ^d —Cal ^d	N.P.D.	Obs ^d —Cal ^d	No. of			
1848.	M.T.	h	m	s	h	m	s	R.A.	N.P.D.	
May 1	8 54 40.7	6 42	47.63	—0.20	65 46	2.1	—15.0	7	7	<i>a</i>
2	9 1 39.2	44 49	49.66	—0.66	46 45	7	17.6	6	6	<i>b</i>
3	8 43 47.9	46 49	49.96	—0.92	47 39	6	15.6	10	6	<i>b</i>
4	9 18 52.5	48 55	52.4	—0.85	48 43	3	13.2	6	6	<i>b</i>
5	8 56 24.2	50 56	15	—0.45	49 39	3	23.0	3	2	<i>c</i>
	9 11 29.2		57.83	—0.06		40.6	22.5	5	5	<i>d</i>
6	9 16 48.6	6 53	0.99	+0.11	65 51	5.0	—11.2	7	7	<i>e</i>

* Mr. Lassell is preparing an account of his polishing machine and methods of grinding specula, &c. to be laid before the Society.