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M. J. JOHNSON, Esq. President, in the Chair.

Rev. F. Silver, Norton, near Market Drayton, Shropshire, was balloted for and duly elected a Fellow of the Society.

On the Measured Distance of 70 *Ophiuchi.*

By the Rev. W. R. Dawes.

"The fine double-star 70 *Ophiuchi*, being quite within the optical power of comparatively small telescopes, has not received from me that constant attention which, perhaps, from its great intrinsic interest it deserves. As, however, the elements of the orbit recently computed by Mr. E. B. Powell give a continued *increase* of distance, while the measures of several observers show that that element is *decreasing*, I am induced to anticipate in this instance the publication of the results I have obtained, forming a portion of a large mass of observations, which, I hope, will before long be in the hands of the Astronomical Society.

"My mean results are the following:—

Pos.	Obs.	Nights.	Dist.	Obs.	Nights.	Epoch.
°			″			
118·83	15	3	6·804	16	3	1848·12
114·66	29	7				1853·60
			6·489	24	5	·68
113·71	18	4	6·339	14	3	1854·73

"These measures fully support the conclusion indicated by those of Captain Jacob, Mr. Miller, and Mr. Fletcher; and, indeed, do not differ widely from any of them. The decrease of distance to the extent of about 0″·4 or 0″·5 since 1848 seems to be well established.

"*Wateringbury, May* 1, 1855.

Observation of an Occultation of Venus by the Moon.

By J. Ferguson, Esq.

(*Letter to Lieut. Maury, U.S.N., Superintendent of the National Observatory, Washington, communicated by Lord Wrottesley.*)

" I submit the following results and description of the occultation of the planet *Venus* by the moon, observed with the large equatoreal on the 18th of the present month. The following are the meteorological indications for the time of observation taken from the journal of the Observatory,—

Bar. 29·912. Therm. attached, 75°. Ext. therm. 70°·5.

" The night was sultry, with a damp atmosphere, but quite serene and clear, till within 15 degrees of the horizon, below which was a brownish haze, as of Indian summer. The dark limb of the moon was distinctly seen with the naked eye until after the occultation. After 8 o'clock the planet became ill-defined, having a reddish-purple tinge. The power of the eyepiece used was 120, with which the following times were observed:—

" At $8^h\ 37^m\ 30^s$ M.T. Wash.—The limbs were in contact. This time is uncertain two seconds, owing to the flame-like edge of the planet, the moon's limb being well defined.

" At $8^h\ 39^m\ 10^s$.—The planet was seen half its diameter within the limb of the moon, exhibiting no diminution of light or of magnitude, but showing as if it were on this, and not on the other side of the moon.

" At $8^h\ 39^m\ 38^s$.—The first diminution of magnitude was apparent, the inside or cut edge being straight and well defined, the planet still showing as if projected on the surface of the moon. The last two phases were observed with great care.

" At $8^h\ 40^m\ 7^s$.—The immersion, which was sudden, but not instantaneous.

" *U.S.N. Observatory, April* 19, 1855."

Account of the Operations for determining the Longitude of Fredericton, New Brunswick, by Galvanic Signals. Extracted from a Report to the Lieutenant-Governor.

(*Communicated by the Astronomer Royal.*)

" The Government of the United States has spared neither pains nor money in determining by the most approved astronomical methods, and by interchanges of upwards of one thousand chronometers, the difference of longitude between Greenwich and Harvard College Observatory, in order that the latter might

serve as a point of reference in conducting the operations of the Coast Survey. By our telegraphic communication with Boston, and through the kind co-operation of Professor Bond and his assistants, we have, at a comparatively insignificant amount of trouble and expenditure, been enabled to avail ourselves of the labours undertaken for the above-mentioned purpose, and thus to ascertain the longitude of Fredericton with probably an equal degree of precision.

"It was originally intended to have an unbroken telegraphic communication between the Fredericton Observatory and that of Harvard University, but in consequence of the wires from the latter to the office in Boston being out of repair, Professor Bond found it necessary to trust to two excellent sidereal micrometers for the interval; and remarks, that on examination he was induced to believe that no greater error had arisen from this source than would have taken place had the communication been made from the room adjoining the transit instrument. Professor Bond's chronometers were carefully and repeatedly compared with his transit-clock and with each other, both before and after interchanging signals, so as to ascertain their error and rate; and at both observatories, on each day of operations, the meridian passages of a number of stars were observed, in order to obtain the error and rate of the transit-clocks.

"On the evening of the 23d of January, 1855, we received the first series of signals from Boston. Mr. Coolidge (Mr. Bond's assistant) commenced at an even minute by his chronometer, and sent us second-beats for fifty consecutive seconds. This was continued for ten successive minutes, beginning always at the even minute, and we carefully noted the times by our transit-clock. On examining all, we found that the times of the first signal would be as exhibited in

Table I.

	Clock Time. h m s	Clock Error +. m s	True Sidereal Time. h m s
At Fredericton	6 29 37·7	1 40·18	6 27 57·52
Cambridge	6 10 21·5	0 21·36	6 10 0·14
		Hence the difference of longitude	0 17 57·38

"On the evening of the 2d of February we took the initiative, and sent a series of signals to Boston, the result from which is given in

Table II.

	Clock Time. h m s	Clock Error +. m s	True Sidereal Time. h m s
At Fredericton	6 38 0	2 25·88	6 35 34·12
Cambridge	6 18 13·3	0 36·48	6 17 36·82
		Hence the difference of longitude	0 17 57·30

" On the same evening we sent another series, and the result deduced from them is shown in

Table III.

	Clock Time. h m s	Clock Error +. m s	True Sidereal Time. h m s
At Fredericton	6 49 0·0	2 25·88	6 46 34·12
Cambridge	6 29 13·3	0 36·48	6 28 36·82
		Hence the difference of longitude	0 17 57·30

" On the same evening we received from Cambridge a series of signals, which give a result exhibited in

Table IV.

	Clock Time. h m s	Clock Error +. m s	True Sidereal Time. h m s
At Fredericton	7 4 23·6	2 25·88	7 1 57·72
Cambridge	6 44 37·0	0 36·48	6 44 0·52
		Hence the difference of longitude	0 17 57·20

" On the evening of the 10th of February we were again in telegraphic communication with Boston, and the result of the first series of signals which were sent from Fredericton and recorded at Boston is exhibited in

Table V.

	Clock Time. h m s	Clock Error +. m s	True Sidereal Time. h m s
At Fredericton	7 1 0	3 23·7	6 57 36·3
Cambridge	6 40 27·05	0 47·89	6 39 39·16
		Hence the difference of longitude	0 17 57·14

" The second series of signals on the same evening was transmitted from Boston and recorded at Fredericton, and the result is as shown in

Table VI.

	Clock Time. h m s	Clock Error +. m s	True Sidereal Time. h m s
At Fredericton	7 17 21	3 23·7	7 13 57·3
Cambridge	6 56 48	0 47·89	6 56 0·11
		Hence the difference of longitude	0 17 57·19

" We next sent a series of signals to Boston, the result derivable from which is given in

Table VII.

	Clock Time. h m s	Clock Error +. m s	True Sidereal Time. h m s
At Fredericton	7 43 0	3 23·7	7 39 36·3
Cambridge	7 22 27	0 47·89	7 21 39·11
		Hence the difference of longitude	0 17 57·19

"We then received from Boston and recorded at Fredericton another series of signals (the fourth of the same evening), the result of which is shown in

Table VIII.

	Clock Time. h m s	Clock Error +. m s	True Sidereal Time. h m s
At Fredericton	7 51 21	3 23·7	7 47 57·3
Cambridge	7 30 48 (17·49 × 30·4 =)	0 47·89	7 30 0·11
		Hence the difference of longitude	0 17 57·19

"And, lastly, we received from Cambridge a single tap for the purpose of comparing clocks, and the result deducible from it is exhibited in

Table IX.

	Clock Time. h m s	Clock Error +. m s	True Sidereal Time. h m s
At Fredericton	8 7 21	3 23·7	8 3 57·3
Cambridge	7 46 48	0 47·89	7 46 0·11
		Hence the difference of longitude	0 17 57·19

"On examining the operations of February 10, it will be perceived that the second-beats of the Boston chronometer and the Fredericton transit-clock continued synchronous throughout, and, therefore, must have had the same rate. Hence the same clock-errors are applicable to the whole of the series for the evening. We may remark, that the results obtained from this last night's work are considered the most complete and satisfactory, and from them alone the difference of longitude would be $0^h\ 17^m\ 57^s{\cdot}18$. If, however, we take the mean of all the operations, the difference would be $0^h\ 17^m\ 57^s{\cdot}23$; and as Cambridge Observatory is $4^h\ 44^m\ 30^s{\cdot}66$ west of Greenwich, it follows that the longitude of Fredericton is $4^h\ 26^m\ 33^s{\cdot}43$ west of Greenwich. Converting the above time into arc, we have,—

	° ′ ″
Longitude of Fredericton	66 38 21·5
The Crown Land Department makes it	66 37 54
Difference	0 0 27·5

"This difference is smaller than could have been anticipated, or than we should have been warranted in assuming.

"J. B. Toldervy.
"W. B. Jack.

"*Fredericton, March* 5, 1855."

The following is an extract of a letter from Professor Jack to the Astronomer Royal, dated Fredericton, April 19, 1855, in reference to the foregoing determination:—

"Morse's machine was employed, and as the armature of the magnet at one end of the line has, on the connexion being made

by means of the finger-key at the other, to move through a space not probably exceeding the $\frac{1}{200}$ part of an inch, and as the contact of the armature and magnet gives a distinct sound, which can be easily compared with the second-beats of the transit-clock, we cannot but think this method susceptible of greater accuracy than that which depends on watching the movements of a needle. Still greater accuracy could have been obtained had we been supplied with Bond's self-registering apparatus."

The following is an extract of a letter, dated April 23, 1855, received from George Hamilton, Esq. F.R.A.S., Egremont, near Liverpool, in reference to Mr. Elliott's invention of a Mechanical Imitation of Precession, alluded to in the last number of the *Monthly Notices:*—

"In the year 1842, Mr. Edward Davis, optician, then of Liverpool, now, I believe, of Shrewsbury, constructed for me an apparatus precisely the same in principle as Atkinson's, and precisely the same in form as Elliot's. I have used the apparatus since that time to illustrate precession of the equinox and nutation of the earth's axis. My apparatus was made after a model shown to me by Mr. Elliot, and, judging from the appearance of his apparatus, I should conclude that it had been constructed many years before."

Elements of Leucothea. By M. Bruhns.

Epoch, 1855. May 0·0, M.T. Berlin.

M	= 351° 16′ 22″·7	
π	= 212 55 38·7	Mean equinox, 1855·0
Ω	= 355 42 15·2	
i	= 7 37 35·9	
φ	= 14 17 36·9	
μ	= 694″·479	
log a	= 0·472232	

These elements were calculated from an observation made at Bilk, dated April 20; and two Berlin observations of April 27 and May 3.

Note relative to a Phenomenon seen in the Planet Venus. By the Rev. W. R. Dawes.

"In the *Monthly Notices* for March 1854, there is a notice of some observations of the planet *Venus*, when near her inferior conjunction, by Mr. Guthrie. The phenomenon he observed is