

XXXIV. *Astronomical Observations made by Samuel Holland, Esquire, Surveyor-General of Lands for the Northern District of North-America; and Others of his Party. Communicated by the Astronomer Royal.*

Obs. of Lat.

MARCH 8, 1769, observed by Samuel Holland, Esquire, at his house, bearing south, 56° west from Quebec, distance from the castle of St. Lewis $2\frac{1}{2}$ miles, with Bird's astronomical quadrant, the latitude, viz.

	°	'	"
Zenith angle of the Sun's upper limb	51	4	0
Deduct for the Sun's southern declination		4	34 31

	46	29	29
Add the Sun's semi-diameter		16	9
Ditto refraction		1	42

North latitude by observation	46	47	20
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Obs. of Long.

MARCH 11, 1769, observed by the same at the same place, with Dollond's refracting telescope, an immersion of the first satellite of Jupiter, at 15 hours, and 45 seconds, mean or equal time.

Obs.

Obf. of Lat. March 19, 1769, observed by the same at the same place, with Bird's astronomical quadrant, the latitude, viz.

	°	'	"
Zenith angle of the Sun's upper limb	46	45	2
Deduct for the Sun's southern declination		14	42
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Add the Sun's semi-diameter	46	30	20
Ditto refraction		16	6
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North latitude by observation	46	47	16

Obf. of Lat. March 20, 1769, observed by the same, at the same place, with the same instrument, the latitude, videlicet,

	°	'	"
Zenith angle of the Sun's upper limb	46	21	16
Add the Sun's northern declination		8	58
Ditto the Sun's semi-diameter		16	5½
Ditto the refraction		1	0
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North latitude by observation	46	47	19½

N. B. Six more observations of the latitude have been taken. The mean result of the whole is } 46 47 15

Obf. of Long. April 3, 1769, observed by the same, at the same place, with Dollond's refracting telescope, an immersion of the first satellite of Jupiter, at 15 hours, 10 minutes, and 22 seconds, mean or equal time.

Obf. of Long. April 18, 1769, observed by the same, at the same place, with the same instrument, an immersion of the second satellite of Jupiter, at 12 hours, 39 minutes, and 36 seconds, mean or equal time.

Obf. of Long. April 19, 1769, observed by the same, at the same place, with the same instrument, an immersion of the first satellite of Jupiter, at 13 hours, 26 minutes, and 27 seconds, mean or equal time.

Obf.

- Obs. of Long.** May 28, 1769, observed by the same, at the same place, with the same instrument, an emerfion of the first fatellite of Jupiter, at 14 hours, 2 minutes, and 40 seconds, mean or equal time. Also, observed by the same, at the same place, with the same instrument, a superior conjunction of the fourth fatellite of Jupiter, at 11 hours, 14 minutes, and 17 seconds, mean or equal time; and it entirely difappeared at 11 hours, 24 minutes, and 3 seconds, mean or equal time.
- Obs. of Transf.** June 3, 1769, observed, by the same, at the same place, with the same instrument, the Transit of Venus, as follows : at 2 hours, 28 minutes, and $1\frac{1}{2}$ seconds, perceived a luminous point on the lower part of the Sun's limb, by appearance ; and, in the same place, $1\frac{1}{2}$ seconds afterwards, the first external contact was formed, which rectified as the clock or time-piece of Graham was 15 seconds too fast at the time of observation (as proved by equal altitudes of the Sun taken with Bird's astronomical quadrant, on the 1st, 2d, 4th, and 5th instant) the equal or mean time of observing the first external contact will be at 2 hours, 27 minutes, and 48 seconds. Mr. St. Germain, of the seminary of Quebec, observed the same contact, at the same instant, with Short's 2 feet reflecting telescope. Clouds, intervening, prevented the observation of the first internal contact : but at 6 o'clock the Planet might be seen with the naked eye on the Sun's disc, through the haziness of the atmosphere.
- Obs. of Long.** June 6, 1769, observed by the same, at the same place, with the same instrument, an emerfion of the first fatellite of Jupiter, at 10 hours, 26 minutes, and 22 seconds, mean or equal time.
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- Obs. of Lat.** January 2, 1768, observed by Ensign George Sproule, of the 59th regiment of foot, on the south point, at the entrance of the bafon of Gaspée, with Hadley's quadrant, and an artificial horizon, the latitude, viz.

Double angle of the meridian } 36 38 0
altitude of the Sun's center

Apparent altitude of the Sun's center 18 19 0
Refraction 2 41

True altitude of the Sun's center 18 16 19
90 0 0

Sun's zenith distance . . . 71 43 41
Sun's declination reduced to the } 22 56 10
meridian of Gaspée

North latitude by observation 48 47 31

Obs. of Lat. May 9, 1768, observed by the same, at the same place, with the same instrument, and an artificial horizon, the latitude, videlicet,

Double angle of the Sun's lower } 117 6 0
limb, meridian altitude
Add for adjusting the quadrant, er- } 2 10
ror to the right,
117 8 10

Apparent altitude of the Sun's } 58 34 5
lower limb
Add the Sun's semi-diameter 15 53

Apparent altitude of the Sun's center 58 49 58
Deduct for Refraction 33

True altitude of the Sun's center 58 49 25
90 0 0

Sun's zenith distance 31 10 35
Add the Sun's declination, reduced } 17 36 56
to the meridian of Gaspée

North latitude by observation 48 47 31

Obs.

Obs. of Lat. May 15, 1768, observed by the same, at the same place, with the same instrument, and an artificial horizon, the latitude, viz.

Double angle of the Sun's upper limb, meridian altitude	121 10 0
Subtract for adjusting the quadrant error to the left	35
	<hr/> 121 9 25 <hr/>
Apparent altitude of the Sun's upper limb	60 34 42
Subtract the Sun's semi-diameter	15 51
	<hr/> 60 18 51 <hr/>
Apparent altitude of the Sun's center	60 18 51
Subtract for refraction	31
	<hr/> 60 18 20 <hr/>
True altitude of the Sun's center	90 0 0
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Sun's zenith distance	29 41 40
Add Sun's declination reduced to the meridian of Gaspée	19 5 50
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North latitude by observation	48 47 30

N. B. There were 12 more observations made of the latitude, by the same person; but these are judged sufficient to shew his manner of operation: but the result of the whole 15 make the place of observation $48^{\circ} 47' 32''$ north latitude.

Obs. of Dong. January 29, 1768, observed by the same person, at the same place, with Short's two feet reflecting telescope, an immersion of the first satellite of Jupiter, at 14 hours, 11 minutes, and 3 seconds, mean or equal time.

Obs. of Long. March 15, 1768, observed by the same person, at the same place, with the same instrument, an immersion of the first satellite of Jupiter, at 14
K. k 2 hours.

hours, 29 minutes, and 38 seconds, equal or mean time.

Obs. of Long. March 16, 1768, observed by the same, at the same place, with the same instrument, an immersion of the second satellite of Jupiter, at 12 hours, 7 minutes, and 16 seconds, equal or mean time.

Obs. of Long. March 16, 1768, observed an immersion of the third satellite of Jupiter, at 13 hours, 38 minutes, and 18 seconds, equal or mean time; by the same person, with the same instrument, at the same place.

Obs. of Long. April 9, 1768, observed by the same person, at the same place, with the same instrument, an emersion of the first satellite of Jupiter, at 11 hours, 19 minutes, and 24 seconds, equal or mean time.

Obs. of Long. April 10, 1768, observed by the same person, at the same place, with the same instrument, an emersion of the second satellite of Jupiter, at 11 hours, 38 minutes, and 45 seconds, equal or mean time.

Obs. of Long. April 25, 1768, observed by the same person, at the same place, with the same instrument, an emersion of the first satellite of Jupiter, at 9 hours, and 37 minutes, equal or mean time.

N. B. This observation is thought to be as exact as possible, the satellite emerging totally in an instant, and the clock being truly regulated by a number of single and corresponding altitudes.

Obs. of Long. May 9, 1768, observed by the same person, at the same place, with the same instrument, an emersion of the first satellite of Jupiter, at 13 hours, 26 minutes, and 47 seconds, equal or mean time.

Obs. of Long. May 12, 1768, observed by the same person, at the same place, with the same instrument, an emersion of the second satellite of Jupiter, at 11 hours, 11 minutes, and 34 seconds, equal or mean time,

Samuel Holland.