

APPENDIX No. 5—Continued.

November 2, 1846.—Camp 89.

DETERMINATION OF LATITUDE.

Time, p. m.			Double altitudes of Polaris.	Latitude.
<i>h.</i>	<i>m.</i>	<i>s.</i>	<i>Deg. min. sec.</i>	<i>Deg. min. sec.</i>
3	39	40.8	68 27 40	33 14 57
3	40	47.6	68 28 05	33 14 49
3	41	48.5	68 28 45	33 14 50
3	42	29.0	68 29 10	33 14 50
3	43	31.6	68 29 45	33 14 48
3	44	13.7	68 30 20	33 14 54
3	45	06.9	68 31 10	33 15 02
3	46	03.5	68 31 20	33 14 53
3	46	57.1	68 31 55	33 14 54
3	47	43.5	68 32 20	33 14 53
3	48	55.8	68 32 55	33 14 57
3	49	13.0	68 33 20	33 14 57

Thermometer 40°.

Mean of 12 observations, 33° 14' 54".

<i>h.</i>	<i>m.</i>	<i>s.</i>	<i>Deg. min. sec.</i>	<i>Deg. min. sec.</i>
3	38	38	108 06 10	3 38 38
3	39	00	108 06 10	3 38 38
3	40	10	108 06 10	3 38 38
3	41	20	108 06 10	3 38 38
3	42	30	108 06 10	3 38 38
3	43	40	108 06 10	3 38 38
3	44	50	108 06 10	3 38 38
3	45	00	108 06 10	3 38 38
3	46	10	108 06 10	3 38 38
3	47	20	108 06 10	3 38 38
3	48	30	108 06 10	3 38 38
3	49	40	108 06 10	3 38 38

Thermometer 40°.  
Mean of 12 observations, 33° 14' 54".

APPENDIX No. 5—Continued.

November 5, 1846.—Camp 91, on the San Pedro.

DETERMINATION OF LATITUDE.

Time, p. m.			Double altitudes of <i>b</i> Aquarii, near the meridian.	Latitude.
<i>h.</i>	<i>m.</i>	<i>s.</i>	<i>Deg. min. sec.</i>	<i>Deg. min. sec.</i>
2	58	31.0	101 33 45	32 57 15
2	59	48.8	101 34 55	32 57 28
3	01	16.1	101 35 50	32 57 36
3	02	57.5	101 36 50	32 57 31
3	04	17.6	101 37 40	32 57 25
3	05	24.8	101 38 00	32 57 19
3	07	06.4	101 37 30	32 57 29
3	07	51.5	101 36 55	32 57 39
3	10	02.8	101 36 30	32 57 14
3	10	42.8	101 35 45	32 57 19
3	11	30.7	101 35 20	32 57 11
3	12	34.0	101 34 10	32 57 11
3	13	30.6	101 32 30	32 57 26

Thermometer 52°.

Mean of 13 observations, 32° 57' 23".

<i>h.</i>	<i>m.</i>	<i>s.</i>	<i>Deg. min. sec.</i>	<i>Deg. min. sec.</i>
3	38	38	100 48 35	3 38 38
3	39	00	100 48 35	3 38 38
3	40	10	100 48 35	3 38 38
3	41	20	100 48 35	3 38 38
3	42	30	100 48 35	3 38 38
3	43	40	100 48 35	3 38 38
3	44	50	100 48 35	3 38 38
3	45	00	100 48 35	3 38 38
3	46	10	100 48 35	3 38 38
3	47	20	100 48 35	3 38 38
3	48	30	100 48 35	3 38 38
3	49	40	100 48 35	3 38 38

Thermometer 52°.  
Mean of 13 observations, 32° 57' 23".

## APPENDIX No. 5—Continued.

November 5, 1846.—Camp No. 91, on the San Pedro.

## DETERMINATION OF TIME.

Time, p. m.			Double altitudes of $\alpha$ Andromedæ, in the east.			Chronometer fast.		
<i>h.</i>	<i>m.</i>	<i>s.</i>	<i>Deg. min. sec.</i>			<i>h.</i>	<i>m.</i>	<i>s.</i>
3	18	27.5	117	33	45	8	41	45.6
3	19	29.2	118	00	30	8	41	42.8
3	20	29.5	118	25	40	8	41	44.2
3	21	30.8	118	51	30	8	41	44.1
3	22	17.5	119	10	50	8	41	44.8
3	23	24.0	119	39	10	8	41	43.9
3	24	24.0	120	04	30	8	41	43.7
3	25	38.8	120	35	40	8	41	44.4
3	26	43.0	121	03	05	8	41	43.4

Thermometer 52°.

Time, p. m.			Double altitudes of $\alpha$ Lyræ, in the west.			Chronometer fast.		
<i>h.</i>	<i>m.</i>	<i>s.</i>	<i>Deg. min. sec.</i>			<i>h.</i>	<i>m.</i>	<i>s.</i>
3	29	32.5	100	48	35	8	41	48.4
3	30	32.8	100	24	30	8	41	46.6
3	31	46.0	99	57	05	8	41	49.1
3	32	43.8	99	33	45	8	41	46.8
3	33	33.0	99	14	15	8	41	45.8
3	34	30.8	98	52	25	8	41	47.1
3	35	25.7	98	31	35	8	41	48.4
3	36	14.8	98	12	10	8	41	47.5
3	37	11.8	97	50	05	8	41	47.3

Thermometer 52°.

Mean of 18 observations, 8*h.* 41*m.* 45.76*s.*

## APPENDIX No. 5—Continued.

November 5, 1846.—Camp 91, on the San Pedro, about  
from its mouth at the Gila.

## DETERMINATION OF LATITUDE.

Time, p. m.			Double altitudes of Polaris.			Latitude.		
<i>h.</i>	<i>m.</i>	<i>s.</i>	<i>Deg. min. sec.</i>			<i>h.</i>	<i>m.</i>	<i>s.</i>
3	40	39.0	68	01	30	32	57	54
3	41	55.5	68	02	30	32	58	02
3	43	23.6	68	03	00	32	57	55
3	44	11.5	68	04	00	32	58	07
3	45	23.8	68	04	20	32	58	07
3	46	39.8	68	05	15	32	58	04
3	47	26.0	68	05	55	32	58	04
3	48	12.8	68	06	20	32	58	09
3	49	22.8	68	06	45	32	57	59
3	50	37.6	68	07	30	32	58	03
3	51	16.0	68	07	30	32	58	03
3	51	54.7	68	08	10	32	58	03

Thermometer 52°.

Mean of 12 observations, 32° 58' 03".

APPENDIX No. 5—Continued.

November 5, 1846.—Camp 91, on the San Pedro.

DETERMINATION OF LONGITUDE.

Time, p. m.			Distance of $\alpha$ Arietis from moon's eastern limb.	Double altitudes of moon's upper limb.
<i>h.</i>	<i>m.</i>	<i>s.</i>	<i>Deg. min. sec.</i>	<i>Deg. min. sec.</i>
12	29	20.0	48 22 30	134 00 30
12	31	01.5	48 22 40	133 26 20
12	32	40.8	48 22 55	132 50 10
12	34	14.2	48 23 40	132 17 35
12	36	29.0	48 23 40	131 30 30
12	38	25.5	48 23 55	130 48 30
12	40	22.6	48 25 40	130 05 30
12	42	09.5	48 26 30	129 27 00
12	43	37.8	48 26 50	128 54 10
12	44	51.5	48 27 10	128 28 10
12	47	31.2	48 27 40	127 29 30
12	49	26.8	48 28 15	126 45 50

Thermometer 32°.

<i>h.</i>	<i>m.</i>	<i>s.</i>	<i>Deg. min. sec.</i>	<i>Deg. min. sec.</i>
12	29	20.0	48 22 30	134 00 30
12	31	01.5	48 22 40	133 26 20
12	32	40.8	48 22 55	132 50 10
12	34	14.2	48 23 40	132 17 35
12	36	29.0	48 23 40	131 30 30
12	38	25.5	48 23 55	130 48 30
12	40	22.6	48 25 40	130 05 30
12	42	09.5	48 26 30	129 27 00
12	43	37.8	48 26 50	128 54 10
12	44	51.5	48 27 10	128 28 10
12	47	31.2	48 27 40	127 29 30
12	49	26.8	48 28 15	126 45 50

Thermometer 32°.

Longitude, by mean of observations, 7h. 23m. 46.9s.

APPENDIX No. 5—Continued.

November 5, 1846.—Camp 91, on the San Pedro.

DETERMINATION OF LONGITUDE.

Time, p. m.			Distance of Regulus from moon's eastern limb.	Double altitudes of moon's upper limb.
<i>h.</i>	<i>m.</i>	<i>s.</i>	<i>Deg. min. sec.</i>	<i>Deg. min. sec.</i>
12	57	55.2	65 18 45	123 36 00
12	59	49.5	65 18 00	122 52 15
13	01	38.0	65 17 20	122 11 15
13	05	13.8	65 16 35	121 34 40
13	04	47.5	65 16 00	120 59 30
13	06	04.5	65 15 30	120 29 50
13	07	57.8	65 14 55	119 46 40
13	09	15.0	65 14 30	119 16 20
13	10	51.5	65 13 55	118 49 00

Thermometer 32°.

Longitude, by mean of observations, 7h. 23m. 46.9s.

<i>h.</i>	<i>m.</i>	<i>s.</i>	<i>Deg. min. sec.</i>	<i>Deg. min. sec.</i>
12	57	55.2	65 18 45	123 36 00
12	59	49.5	65 18 00	122 52 15
13	01	38.0	65 17 20	122 11 15
13	05	13.8	65 16 35	121 34 40
13	04	47.5	65 16 00	120 59 30
13	06	04.5	65 15 30	120 29 50
13	07	57.8	65 14 55	119 46 40
13	09	15.0	65 14 30	119 16 20
13	10	51.5	65 13 55	118 49 00

Thermometer 32°.

APPENDIX No. 5—Continued.

November 6, 1846.—Camp 91, on the San Pedro.

DETERMINATION OF TIME.

Time, p. m.			Double altitudes of <i>a</i> Andromedæ in the east.	Chronometer fast.
<i>h.</i>	<i>m.</i>	<i>s.</i>	Deg. min. sec.	<i>h.</i> <i>m.</i> <i>s.</i>
3	12	38.0	116 51 40	8 41 32.2
3	13	45.8	117 20 15	8 41 32.0
3	14	31.0	117 40 00	8 41 30.5
3	15	26.0	118 02 45	8 41 31.1
3	16	19.7	118 24 50	8 41 32.3
3	17	17.6	118 50 05	8 41 30.1
3	18	12.8	119 12 25	8 41 32.2
3	18	59.8	119 33 15	8 41 29.6

Thermometer 64°.

Time, p. m.			Double altitudes of <i>a</i> Lyræ in the west.	Chronometer fast.
<i>h.</i>	<i>m.</i>	<i>s.</i>	Deg. min. sec.	<i>h.</i> <i>m.</i> <i>s.</i>
3	22	56.5	101 45 35	8 41 35.1
3	23	53.8	101 21 55	8 41 31.5 rej.
3	24	44.8	101 03 15	8 41 34.4
3	25	22.5	100 49 05	8 41 35.6
3	26	11.2	100 29 50	8 41 34.6
3	27	07.5	100 08 15	8 41 35.3
3	28	00.5	99 47 45	8 41 35.6
3	28	55.8	99 25 50	8 41 34.3

Thermometer 64°.

APPENDIX No. 5—Continued.

November 6, 1846.—Camp 91, on the San Pedro.

DETERMINATION OF LONGITUDE.

Time,	Distance of Aldebaran from moon's western limb.	Double altitudes of moon's upper limb.
<i>h.</i> <i>m.</i> <i>s.</i>	Deg. min. sec.	Deg. min. sec.
7 43 11.0	25 53 55	65 27 10
7 44 45.2	25 54 25	66 06 20
7 47 03.8	25 55 35	67 03 10
7 49 18.0	25 56 15	67 58 10
7 51 03.0	25 57 15	68 40 50

Thermometer 42°.

Immersion of Jupiter's satellite, 6h. 42m. 40s.

Time,	Distance of Aldebaran from moon's western limb.	Double altitudes of moon's upper limb.
<i>h.</i> <i>m.</i> <i>s.</i>	Deg. min. sec.	Deg. min. sec.
8 41 35.1	101 45 35	8 41 35.1
8 41 31.5	101 21 55	8 41 31.5
8 41 34.4	101 03 15	8 41 34.4
8 41 35.6	100 49 05	8 41 35.6
8 41 34.6	100 29 50	8 41 34.6
8 41 35.3	100 08 15	8 41 35.3
8 41 35.6	99 47 45	8 41 35.6
8 41 34.3	99 25 50	8 41 34.3

Thermometer 42°.

Mean of observations, 33° 02' 57".

## APPENDIX No. 5—Continued.

November 8, 1846.—Camp 93, on the Gila.

## DETERMINATION OF LATITUDE.

Time, p. m.	Double altitudes of $\beta$ Aquarii, near the meridian.	Latitude.
<i>h. m. s.</i>	<i>Deg. min. sec.</i>	<i>Deg. min. sec.</i>
2 49 26.8	101 19 40	33 05 18
2 50 27.5	101 20 15	33 05 25
2 51 29.0	101 20 50	33 05 23
2 52 28.7	101 21 20	33 05 27
2 53 22.9	101 21 35	33 05 27
2 54 37.6	101 21 40	33 05 30
2 56 03.5	101 22 00	33 05 16
2 56 56.0	101 21 40	33 05 18
2 57 44.2	101 21 00	33 05 27
2 59 11.0	101 20 30	33 05 14
3 00 19.9	101 19 20	33 05 20

Thermometer 44°.

Mean of 12 observations, 33° 05' 24".

Time, p. m.	Double altitudes of Polaris.	Latitude.
<i>h. m. s.</i>	<i>Deg. min. sec.</i>	<i>Deg. min. sec.</i>
3 30 26.0	68 17 40	33 05 48
3 31 20.0	68 18 10	33 05 48
3 32 32.5	68 18 40	33 05 43
3 33 38.5	68 19 45	33 05 58
3 34 29.0	68 20 10	33 05 55
3 35 07.2	68 20 45	33 06 02
3 35 47.0	68 21 20	33 06 09
3 36 28.8	68 21 45	33 06 09
3 37 18.0	68 22 15	33 06 01

Thermometer 42°.

Mean of 9 observations, 33° 05' 57".

## APPENDIX No. 5—Continued.

November 8, 1846.—Camp 93, on the Gila.

## DETERMINATION OF TIME.

Time, p. m.	Double altitudes of $\alpha$ Andromedæ, in the east.	Chronometer fast.
<i>h. m. s.</i>	<i>Deg. min. sec.</i>	<i>h. m. s.</i>
3 05 32.0	116 43 10	8 42 39.2
3 06 26.8	117 05 45	8 42 40.3
3 07 27.6	117 32 40	8 42 37.0
3 08 33.5	117 59 15	8 42 39.5
3 09 30.0	118 23 40	8 42 37.9
3 10 22.3	118 45 20	8 42 39.5
3 11 13.8	119 06 55	8 42 38.6
3 12 24.6	119 36 50	8 42 38.2

Thermometer 42°.

Time, p. m.	Double altitudes of $\alpha$ Lyrae, in the west.	Chronometer fast.
<i>h. m. s.</i>	<i>Deg. min. sec.</i>	<i>h. m. s.</i>
3 15 31.0	102 07 10	8 42 41.6
3 16 29.5	101 44 40	8 42 42.2
3 17 19.0	101 25 55	8 42 43.5
3 18 21.5	101 01 35	8 42 43.2
3 19 10.8	100 42 55	8 42 44.4
3 20 02.8	100 21 40	8 42 41.6
3 20 46.8	100 04 45	8 42 42.0
3 21 42.2	99 43 15	8 42 41.9

Thermometer 42°.

Mean of 16 observations, 8h. 42m. 40.6cs.

## APPENDIX No. 5—Continued.

November 10, 1846.—Camp 95, Caroon plain, on the Gila.

## DETERMINATION OF TIME.

Time, p. m.			Double altitudes of <i>a</i> Andromedæ, in the east.			Chronometer fast.		
<i>h.</i>	<i>m.</i>	<i>s.</i>	<i>Deg. min. sec.</i>			<i>h.</i>	<i>m.</i>	<i>s.</i>
2	51	20.2	113	20	05	8	44	24.1
2	52	11.5	113	41	35	8	44	23.3
2	53	21.0	114	10	30	8	44	24.0
2	54	10.8	114	30	50	8	44	25.3
2	55	03.8	114	53	05	8	44	23.3
2	56	05.0	115	19	25	8	44	23.9
2	56	59.6	115	42	15	8	44	24.0
2	57	52.1	116	04	35	8	44	25.3

Thermometer 52°.

Time, p. m.			Double altitudes of <i>a</i> Lyrae, in the west.			Chronometer fast.		
<i>h.</i>	<i>m.</i>	<i>s.</i>	<i>Deg. min. sec.</i>			<i>h.</i>	<i>m.</i>	<i>s.</i>
3	03	15.5	104	30	25	8	44	29.5
3	04	18.0	104	05	30	8	44	27.7
3	05	07.8	103	46	10	8	44	27.9
3	06	01.1	103	25	40	8	44	28.5
3	06	47.8	103	07	35	8	44	28.6
3	07	30.8	102	51	20	8	44	29.8
3	08	13.5	102	34	10	8	44	28.4
3	09	00.5	102	15	45	8	44	29.1
3	09	47.8	101	57	50	8	44	29.3

Thermometer 52°.

Mean of 18 observations, 8h. 44m. 26.52s.

Thermometer 42°.

Mean of 9 observations, 33° 05' 57".

## APPENDIX No. 5—Continued.

November 10, 1846.—Camp 95.

## DETERMINATION OF LATITUDE.

Time, p. m.			Double altitudes of Polaris.			Latitude.		
<i>h.</i>	<i>m.</i>	<i>s.</i>	<i>Deg. min. sec.</i>			<i>Deg. min. sec.</i>		
3	27	02.0	68	16	25	33	04	25
3	27	55.8	68	16	45	33	04	20
3	28	50.0	68	17	20	33	04	22
3	29	41.8	68	17	55	33	04	26
3	30	30.0	68	18	15	33	04	22
3	31	14.5	68	18	30	33	04	17
3	31	52.5	68	18	55	33	04	20
3	32	23.8	68	19	10	33	04	17
3	33	08.5	68	19	40	33	04	21
3	34	00.5	68	19	55	33	04	14
3	34	44.0	68	21	00	33	04	34 rej.
3	35	44.5	68	21	00	33	04	18
3	36	25.8	68	21	30	33	04	27

Thermometer 50°.

Mean of 12 observations, 33° 04' 21".

APPENDIX No. 5—Continued.

November 12, 1846.—Camp 97, below Pimos village, about four miles from the Gila.

DETERMINATION OF LATITUDE.

Time, p. m.			Double altitudes of $\kappa$ Aquarii, near the meridian.	Latitude.
<i>h.</i>	<i>m.</i>	<i>s.</i>	Deg. min. sec.	Deg. min. sec.
2	35	15.0	101 09 45	33 09 32
2	37	17.0	101 12 20	33 09 10
2	38	28.5	101 12 45	33 09 22
2	39	53.8	101 13 15	33 09 29
2	40	55.8	101 13 40	33 09 20
2	41	50.3	101 14 05	33 09 09
2	43	05.5	101 13 25	33 09 25
2	43	40.0	101 12 50	33 09 37 rej.
2	44	29.8	101 13 10	33 09 18
2	45	18.0	101 12 45	33 09 17
2	46	12.0	101 12 10	33 09 22
2	47	07.5	101 11 20	33 09 19
2	48	25.0	101 10 25	33 09 07
2	49	41.5	101 08 25	33 09 19

Thermometer 50°.

Mean of 13 observations, 33° 09' 19".

Thermometer 52°.

Mean of 18 observations, 34.44m. 26.52s.

APPENDIX No. 5—Continued.

November 13, 1846.—Camp 97.

DETERMINATION OF LONGITUDE.

Time, a. m.			Distance between sun's and moon's nearest limbs.	Double altitude of moon's lower limb.
<i>h.</i>	<i>m.</i>	<i>s.</i>	Deg. min. sec.	Deg. min. sec.
4	16	46.8	60 36 45	
4	18	10.0	60 56 25	
4	20	59.5	60 56 05	
4	23	05.2	60 55 30	114 18 15
4	24	45.8	60 55 00	114 20 50
4	26	17.0	60 54 20	114 22 25
4	28	09.2	60 34 25	114 23 30
4	31	26.5	60 33 05	114 25 10
4	33	00.0	60 32 50	114 24 50
4	34	47.3	60 52 45	114 23 40
4	36	04.8	60 32 05	114 22 10
4	38	25.0	60 31 25	114 19 30
4	40	07.6	60 31 05	114 16 10
4	41	26.5	60 30 30	114 13 50

Thermometer 54°.

INDEX ERROR.

On the arc..... 31 55"  
Off the arc..... 32 25"

Thermometer 50°.

Mean of 23 observations, 34.44m. 26.52s.

## APPENDIX No. 5—Continued.

November 12, 1846.—Camp 97.

## DETERMINATION OF TIME.

Time, p. m.	Double altitudes of $\alpha$ Andromedæ, in the east.	Chronometer fast.
<i>h. m. s.</i>	<i>Deg. min. sec.</i>	<i>h. m. s.</i>
2 55 19.8	117 53 15	8 45 23.8
2 56 27.2	118 21 15	8 45 25.2
2 57 31.0	118 48 20	8 45 24.5
2 58 17.0	119 07 10	8 45 25.7
2 59 04.7	119 27 40	8 45 22.5
2 59 48.5	119 46 15	8 45 23.9
3 00 32.8	120 04 55	8 45 23.8
3 01 29.2	120 29 15	8 45 22.1
3 02 16.8	120 48 25	8 45 24.1
3 03 05.0	121 08 38	8 45 24.2

Thermometer 50°.

Time, p. m.	Double altitudes of $\alpha$ Lyrae, in the west.	Chronometer fast.
<i>h. m. s.</i>	<i>Deg. min. sec.</i>	<i>h. m. s.</i>
3 07 26.8	100 15 40	8 45 26.9
3 08 11.2	99 59 05	8 45 28.5
3 09 19.8	99 31 50	8 45 27.9
3 10 05.5	99 14 15	8 45 27.2
3 11 03.8	98 51 45	8 45 27.3
3 11 45.5	98 35 45	8 45 27.9
3 12 50.0	98 10 55	8 45 28.2
3 13 47.2	97 48 40	8 45 27.9
3 14 35.5	97 29 50	8 45 27.5
3 15 24.8	97 10 30	8 45 26.8
3 16 19.8	96 49 10	8 45 26.7
3 17 05.0	96 31 25	8 45 26.0

Thermometer 50°.

Mean of 22 observations, 8h. 45m. 25.79s.

## APPENDIX No. 5—Continued.

November 12, 1846.—Camp 97.

## DETERMINATION OF LATITUDE.

Time, p. m.	Double altitudes of Polaris.	Latitude.
<i>h. m. s.</i>	<i>Deg. min. sec.</i>	<i>Deg. min. sec.</i>
3 28 58.5	68 31 50	33 09 40
3 29 52.5	68 32 20	33 09 41
3 30 46.0	68 32 50	33 09 41
3 31 51.8	68 33 05	33 09 31
3 33 16.0	68 34 00	33 09 35
3 34 05.0	68 34 35	33 09 40
3 35 03.8	68 34 55	33 09 33
3 36 07.0	68 35 40	33 09 38
3 37 04.0	68 36 05	33 09 35
3 37 41.8	68 36 45	33 09 43
3 38 34.2	68 37 00	33 09 58
3 39 11.5	68 37 35	33 09 31

Thermometer 48°.

Mean of 12 observations, 33° 09' 37".