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1st Session. } { pt. 2, vol. II.

ANNUAL REPORT
OF THE
CHIEF OF ENGINEERS,
UNITED STATES ARMY,
TO THE
SECRETARY OF WAR,
FOR
THE YEAR 1891.
~~REPORT OF~~
~~THE~~
~~CHIEF OF~~
~~ENGINEERS,~~
CALIFORNIA
IN SIX PARTS.

PART VI.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1891.

APPENDIX A A A—REPORT OF MISSOURI RIVER COMMISSION. 3775

TABLE V.—Tabulated results of secondary triangulation, etc.—Continued.

Station.	Observed angle.			Adjusted angle.			Azimuth.			Distance.		Latitude.			Longitude.		
	°	'	"	°	'	"	°	'	"	Feet.	Metres.	°	'	"	°	'	"
Fort Rice	47	42	01.02	01.70	298	02	55.61	42,888.27	13,072.22								
McIntyre	75	06	46.00	45.31	43	02	42.42	37,744.06	11,504.28								
Cannon Ball	57	11	11.60	12.99	165	47	02.99	49,317.58	15,031.86	46	23	55.25	100	38	19.27		
McIntyre	48	12	53.80	53.60	43	02	42.42	37,744.06	11,504.28								
Cannon Ball	49	16	53.36	53.36	272	15	09.52	28,386.53	8,652.14								
Gayton	82	30	13.66	13.04	174	50	15.63	28,853.73	8,794.54	46	23	44.04	100	31	34.64		
Cannon Ball	57	16	29.58	26.28	272	15	09.52	28,386.53	8,652.14								
Gayton	61	15	48.60	50.12	31	04	12.34	27,183.66	8,285.50								
Givens	61	27	40.84	41.60	149	34	06.02	28,333.11	8,635.85	46	19	54.15	100	34	54.54		
Gayton	31	28	24.83	24.96	81	04	12.34	27,183.66	8,285.50								
Givens	108	29	47.82	46.50	319	31	34.23	22,066.22	6,725.72								
Beaver Creek	40	01	47.77	48.54	179	35	50.25	40,080.61	12,216.46	46	17	08.40	100	31	30.62		
Givens	65	24	25.60	24.66	319	31	34.23	22,066.22	6,725.72								
Beaver Creek	64	05	02.32	01.83	75	28	59.80	25,999.46	7,924.56								
Van Solen	50	30	33.99	33.51	204	54	07.38	25,717.77	7,838.70	46	16	03.91	100	37	28.84		
Beaver Creek	65	39	23.72	24.78	75	28	59.80	25,999.46	7,924.56								
Van Solen	64	13	36.98	36.99	319	38	17.97	30,870.02	9,409.10								
Little Beaver	50	06	57.54	58.23	189	48	41.49	30,511.80	9,290.91	46	12	11.61	100	32	44.64		
Van Solen	49	11	35.30	34.81	319	38	17.97	30,870.02	9,409.10								
Little Beaver	87	34	06.21	05.29	52	07	37.82	34,108.87	10,396.29								
Battle Creek	43	14	19.48	19.90	188	48	42.00	45,022.42	13,722.71	46	08	44.72	100	39	07.00		
Little Beaver	52	17	04.84	03.09	52	07	37.82	34,108.87	10,396.29								
Battle Creek	60	44	13.29	13.42	292	47	15.48	29,316.97	8,935.73								
Cathard	66	58	43.97	42.89	179	50	34.98	32,330.98	9,854.39	46	06	52.45	100	32	43.38		
Battle Creek	53	08	04.54	03.48	292	47	15.48	29,316.97	8,935.73								
Cathard	36	03	55.08	54.97	76	47	57.02	23,457.15	7,149.67								
Fort Yates	90	48	02.87	01.55	165	56	01.93	17,260.77	5,261.03	46	05	59.44	100	38	07.42		
Cathard	72	35	25.44	25.71	76	47	57.02	23,457.15	7,149.67								
Fort Yates	43	33	05.68	04.08	300	17	07.63	24,933.13	7,590.55								
Winona	63	51	30.85	30.21	104	12	17.78	18,003.65	5,487.46	46	03	55.20	100	33	02.12		
Fort Yates	38	58	47.74	46.09	300	17	07.63	24,933.13	7,590.55								
Winona	105	14	14.56	13.83	15	06	33.65	20,822.97	6,175.57								
Fire Heart	35	47	01.04	00.08	159	18	22.26	41,142.00	12,539.97	45	59	39.55	100	34	41.14		
Winona	43	43	23.51	23.82	15	06	33.65	26,822.97	8,175.57								
Fire Heart	50	57	59.66	58.99	246	03	21.41	18,601.73	5,609.75								
McRay	85	18	38.32	37.19	151	24	51.90	20,905.44	6,371.92	46	00	54.01	100	30	40.28		
McRay	50	10	44.43	43.71	66	06	14.68	18,601.73	5,609.75								
Fire Heart	95	22	17.54	16.10	341	25	37.55	25,255.97	7,697.95								
Martin	34	27	00.91	00.19	195	53	59.58	32,739.00	9,978.76	45	55	43.20	100	32	47.35		
McRay	55	41	48.69	48.10	15	55	30.94	32,739.00	9,978.76								
Martin	43	10	23.03	22.44	239	04	22.06	27,371.97	8,342.90								
Doerschlag	81	07	50.63	49.46	140	16	10.43	32,671.20	6,910.12	45	58	01.94	100	27	14.98		
Martin	106	43	30.98	31.62	239	04	22.06	27,371.97	8,342.90								
Doerschlag	40	22	33.13	32.47	18	45	48.46	48,262.21	14,710.19								
St. Benedict	32	53	54.58	55.91	165	49	15.03	32,645.15	9,950.15	45	50	30.75	100	30	54.23		
Doerschlag	50	53	16.75	17.20	18	45	48.46	48,262.21	14,710.00								
St. Benedict	38	46	25.83	24.62	237	29	35.67	37,448.16	11,414.09								
La Grace	90	20	18.80	18.18	147	55	14.43	30,224.42	9,212.32	45	53	49.18	100	23	27.76		
St. Benedict	76	28	08.11	07.56	237	29	35.67	37,448.16	11,414.09								
La Grace	52	59	33.55	33.90	4	43	22.11	47,158.35	14,373.73								
Box Elder	50	32	19.49	18.54	134	02	25.28	38,733.90	11,805.98	45	46	05.12	100	24	20.98		
La Grace	32	59	57.85	58.23	4	35	22.11	47,158.35	14,373.73								
Box Elder	84	52	38.32	37.48	269	27	21.51	29,055.73	8,856.11								
Kirkland	62	07	24.74	24.29	151	39	39.53	53,136.04	16,195.72	45	46	07.63	100	17	31.17		
Box Elder	61	58	55.24	55.88	269	27	21.51	29,055.73	8,856.11								
Kirkland	64	57	38.00	38.82	24	34	86.23	32,093.79	9,782.09								
Blume	53	03	26.13	25.30	151	28	56.25	32,937.81	10,039.35	45	41	18.45	100	20	39.18		
Kirkland	45	34	31.20	30.93	24	34	36.23	32,093.79	9,782.09								
Blume	67	56	21.71	21.33	272	28	43.02	24,096.21	7,618.77								
Campbell	66	29	08.02	07.74	150	02	02.47	32,437.73	9,886.93	45	41	08.63	100	14	47.46		
Blume	88	46	43.45	45.28	272	28	43.02	24,096.21	7,618.77								
Campbell	52	03	29.39	31.55	40	20	23.05	39,572.35	12,061.54								
Roth	39	09	42.77	43.47	181	15	21.45	31,215.49	9,514.40	45	36	11.35	100	20	48.81		
Blume	46	37	25.54	24.76	1	15	28.34	31,215.49	9,514.40								
Roth	69	03	09.03	06.66	112	12	14.73	25,174.96	7,673.26								
Ashley	64	19	31.88	28.58	227	48	51.73	32,346.02	9,858.98	45	37	45.15	100	26	16.76		
Roth	81	00	21.41	18.90	112	12	14.73	25,174.96	7,673.26								
Ashley	37	02	33.23	32.69	329	10	53.08	28,174.25	8,587.43								
Aske	61	57	10.41	08.42	211	10	26.45	17,183.65	5,237.53	45	33	46.22	100	22	53.90		
Ashley	57	30	06.63	07.59	329	10	53.08	28,174.25	8,587.43								
Aske	70	29	25.66	25.78	78	44	52.15	30,145.22	9,188.18								
Grand River	52	01	25.88	26.62	206	38	28.93	33,686.36	10,267.51	45	32	47.94	100	29	49.28		
Aske	61	50	06.62	06.98	78	44	52.15	30,145.22	9,188.18								
Grand River	55	41	41.75	42.63	314	21	38.31	29,969.43	9,134.60								
Blue Blanket	62	28	09.79	10.39	196	53	23.30	28,081.26	8,559.09	45	29	20.96	100	24	48.56		
Aske	49	09	19.17	18.83	16	54	45.11</										

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TABLE V.—*Tabulated results of secondary triangulation, etc.—Continued.*

Station.	Observed angle.			Adjusted angle.			Azimuth.		Distance.		Latitude.			Longitude.		
	°	'	"	°	'	"	°	'	Feet.	Meters.	°	'	"	°	'	"
Blue Blanket	41	45	23.58	22.55	280	18	51.37	28,857.17	8,795.59							
Fox Island	74	51	12.86	13.24	25	22	22.11	21,494.60	6,551.49							
Curlew	63	23	25.39	24.21	142	07	25.28	31,154.74	9,495.88	45	25	18.25	100	20	20.10	
Fox Island	61	58	04.78	05.72	25	32	22.11	21,494.60	6,551.49							
Curlew	79	23	57.48	56.49	284	54	46.08	30,389.69	9,262.69							
Bennett	38	37	57.88	57.79	143	37	36.96	33,840.88	10,314.61	45	24	00.83	100	13	28.60	
Curlew	55	23	02.03	00.80	284	54	46.08	30,389.69	9,262.69							
Bennett	73	45	31.53	30.85	31	14	08.20	32,246.61	9,828.67							
Le Beau	50	51	28.52	28.35	160	19	53.28	37,619.32	11,466.26	45	19	28.54	100	17	22.61	
Bennett	40	47	59.93	60.85	31	14	08.20	32,246.61	9,828.67							
Le Beau	46	41	13.17	12.50	257	52	34.24	21,091.04	6,428.49							
McKinley	92	30	46.97	46.65	170	26	46.18	23,485.70	7,158.38	45	20	12.18	100	12	33.97	
Le Beau	72	58	04.52	05.37	257	52	34.24	21,091.04	6,428.49							
McKinley	70	54	37.44	37.27	7	01	22.17	34,208.73	10,426.73							
Scranton	36	07	17.95	17.96	150	53	23.22	33,810.38	10,305.31	45	14	36.96	100	13	32.42	
Le Beau	39	01	28.28	29.12	330	50	39.66	33,810.38	10,305.31							
Scranton	86	20	03.67	02.52	64	33	20.64	26,104.01	7,956.43							
St. Stephen	54	38	29.09	28.36	189	50	58.50	41,372.62	12,610.26	45	12	46.10	100	19	01.65	
Scranton	50	29	39.58	39.19	64	33	20.64	26,104.01	7,956.43							
St. Stephen	89	17	27.78	27.40	333	46	54.42	43,397.42	13,227.41							
Bunker Hill	31	12	53.59	53.41	185	02	57.43	50,365.83	15,351.36	45	06	21.61	100	14	34.37	
St. Stephen	34	43	37.41	38.83	333	46	54.42	43,397.42	13,227.41							
Bunker Hill	97	13	06.84	08.62	56	36	55.20	33,239.39	10,131.27							
Charger	48	03	09.18	12.55	188	29	08.61	57,885.45	17,643.32	45	03	20.84	100	21	00.95	
Bunker Hill	37	05	12.91	11.99	56	36	55.20	33,239.39	10,131.27							
Charger	96	50	44.19	43.31	333	23	04.85	27,832.71	8,483.33							
Forest City	46	04	04.44	04.70	199	29	12.32	45,826.32	13,967.74	44	59	15.11	100	18	07.48	
Charger	77	06	52.82	51.67	333	23	04.85	27,832.71	8,483.33							
Forest City	61	48	57.83	57.86	91	36	09.62	41,298.19	12,587.57							
Travassy	41	04	11.22	10.47	230	25	13.04	37,341.98	11,381.73	44	59	26.12	100	27	41.83	
Forest City	37	20	40.21	39.07	91	36	09.62	41,298.19	12,587.57							
Travassy	80	54	59.49	57.33	352	24	21.02	28,441.58	8,668.91							
Pascal	61	44	25.70	23.60	234	09	21.61	46,298.68	14,111.71	44	54	47.75	100	26	49.60	
Forest City	39	45	48.41	48.24	54	15	30.46	46,298.68	14,111.71							
Pascal	83	40	21.92	23.02	317	49	44.76	35,486.75	10,816.26							
Artichoke	56	33	48.80	48.73	194	27	26.87	55,143.00	16,807.43	44	50	27.93	100	21	19.01	
Artichoke	97	38	10.89	10.95	137	53	38.01	35,486.75	10,816.26							
Pascal	36	46	21.17	21.59	354	36	06.42	49,235.56	15,006.86							
Fairbank	45	35	27.81	27.46	220	12	19.24	29,738.18	9,004.12	44	46	43.75	100	25	45.40	
Pascal	66	00	49.37	48.76	354	36	06.42	49,235.56	15,006.86							
Fairbank	47	10	48.39	47.06	127	26	04.52	48,938.96	14,916.46							
Plum Island	66	48	26.14	24.19	240	31	19.98	39,289.05	11,975.20	44	51	37.13	100	34	44.83	
Fairbank	101	02	12.11	10.52	127	26	04.52	48,938.96	14,916.46							
Plum Island	30	09	24.35	23.55	337	29	08.00	63,832.60	19,456.00							
Sully	48	48	26.81	25.93	206	21	32.36	32,671.44	9,958.16	44	41	54.74	100	29	06.48	
Plum Island	49	11	06.03	07.55	337	29	08.00	63,832.60	19,456.00							
Sully	69	13	14.14	13.67	88	19	52.37	54,923.29	16,740.47							
Fort Bennett	01	35	37.37	38.78	206	35	18.88	67,849.56	20,680.30	44	41	38.25	100	41	46.38	
Fort Bennett	76	58	31.83	28.79	268	10	57.93	54,923.29	16,740.47							
Sully	55	15	35.71	34.95	33	04	17.15	72,271.78	22,028.24							
Fielder	47	45	55.22	56.26	165	11	58.31	60,957.28	18,579.61	44	31	56.36	100	33	10.84	
Sully	32	04	33.04	35.11	33	04	17.15	72,271.78	22,028.24							
Fielder	78	26	22.41	20.98	291	24	16.06	40,979.06	12,490.30							
Ingham	69	29	05.08	03.91	180	59	29.12	75,600.37	23,042.78	44	29	28.34	100	29	24.58	
Fielder	35	06	29.75	31.05	291	24	16.06	40,979.06	12,490.30							
Ingham	95	48	23.00	23.96	15	42	00.92	31,188.15	9,506.06							
Ferry	49	05	03.62	04.99	146	35	34.43	53,949.91	16,443.78	44	24	31.84	100	31	20.83	
Ferry	52	34	28.80	28.74	195	40	39.52	31,188.15	9,506.06							
Ingham	36	26	48.30	48.50	339	15	12.39	24,771.62	7,550.32							
Brown Hill	90	58	43.38	42.76	68	17	54.27	18,530.83	5,648.15	44	25	39.58	100	27	23.68	
Ingham	52	48	14.18	11.89	339	15	12.39	24,771.62	7,550.32							
Brown Hill	63	32	59.79	58.41	222	49	35.51	22,020.65	6,711.83							
Stony Hill	63	38	51.11	49.70	106	30	49.78	24,750.68	7,543.94	44	28	19.00	100	23	57.26	
Brown Hill	47	58	42.34	42.76	222	49	35.51	22,020.65	6,711.83							
Stony Hill	73	01	26.49	27.61	329	50	32.41	19,085.55	5,817.22							
Snake Butte	58	59	48.13	49.03	90	52	15.25	24,571.50	7,489.33	44	25	36.03	100	21	45.15	
Brown Hill	56	55	51.72	50.85	270	48	18.30	24,571.50	7,489.33							
Snake Butte	63	53	40.03	40.52	26	58	34.69	23,978.60	7,308.61							
Fort	59	10	30.01	28.03	147	46	21.28	25,694.67	7,831.66	44	22	04.98	100	24	14.87	
Snake Butte	45	47	10.20	10.75	26	58	34.69	23,978.60	7,308.61							
Fort	47	34	38.82	37.94	251	31	27.91	17,216.22	5,247.46							
Pierre	80	38	11.01	11.31	161	12	18.90	17,741.23	5,404.43	44	22	50.28	100	20	26.44	
Fort	54	24	50.18	49.70	254	31	27.91	17,216.22	5,247.46							
Pierre	71	28	45.75	46.67	3	05	20.96	17,282.78	5,267.74							
Bad River	54	06	24.43	23.03	128	58	48.35	20,151.12	6,142.01	44	19	36.06	100	20	39.25	
Pierre	61	39	40.46	40.13	3	05	20.96	17,282.78	5,267.74							
Bad River	37	53	04.11	04.31	221	04	15.33	15,124.70	4,702.93							
Cemetery	80	21	17.58	16.56	121	27	09.13	10,789.12	3,285.49	44	21	54.71	100	18	19.73	

TABLE VI.—*Tabulated results of secondary triangulation from Pierre to Running Water*
 [Azimuths and distances are in the order of stations, first to second, second to third, and third to first in each triangle.]

Station.	Observed angle.			Adjusted angle.			Azimuth.			Distance.		Latitude.			Longitude.		
	°	'	"	°	'	"	°	'	"	Fees.	Metres.	°	'	"	°	'	"
Bad River	31	56	10.63	11.33	221	04	15.33	15	429	70	4,702.93						
Cemetery	78	12	14.10	15.51	322	53	37.33	8	693.63	2,649.80							
East Base	69	51	31.88	33.16	73	02	54.61	16	087.69	4,903.48	44	20	46.24	100	17	07.56	
Cemetery	94	56	12.64	15.35	322	53	37.33	8	693.63	2,649.80							
East Base	38	51	34.64	36.61	104	02	51.17	11	999.89	3,657.53							
West Base	46	12	08.49	08.04	237	48	51.15	7	557.04	2,303.36							
Bad River	62	30	23.05	23.28	221	04	15.33	15	429.70	4,702.93							
Cemetery	46	19	22.60	23.88	354	46	20.20	14	461.12	4,407.71							
Plateau	71	10	13.55	12.83	103	36	20.08	11	790.49	3,593.71	44	19	32.50	100	18	01.60	
Cemetery	62	22	53.78	52.82	354	46	20.20	14	461.12	4,407.71							
Plateau	73	57	56.39	56.39	248	44	29.22	18	562.23	5,557.72							
Barth	43	39	12.88	10.85	112	26	26.42	20	134.35	6,136.89	44	20	38.89	100	14	03.58	
Plateau	42	57	50.70	50.84	248	44	29.22	18	562.23	5,657.72							
Barth	68	48	36.70	37.11	359	58	38.42	13	622.83	4,152.20							
Farm Island	68	13	30.29	32.05	111	45	06.40	18	636.94	5,680.49	44	18	24.37	100	14	03.51	
Barth	84	09	16.62	17.99	359	58	38.42	13	622.83	4,152.20							
Farm Island	64	03	28.90	29.70	244	02	08.20	25	727.15	7,841.56							
Perry	31	47	12.65	12.81	95	53	02.85	23	255.76	7,088.29	44	20	15.48	100	08	45.20	
Farm Island	39	16	13.38	13.03	244	02	08.20	25	727.15	7,841.56							
Perry	82	42	41.04	41.09	341	23	09.39	19	108.73	5,851.72							
Narselles	58	01	05.24	05.88	103	23	02.31	30	085.76	9,170.06	44	17	15.80	100	07	21.06	
Perry	53	09	22.57	22.47	341	23	09.39	19	108.73	5,851.72							
Narselles	52	56	54.16	53.14	214	21	01.39	15	991.79	4,874.25							
Rouasseur	73	53	44.53	44.39	108	16	12.48	15	948.15	4,860.95	44	19	26.16	100	05	16.95	
Narselles	43	12	34.68	34.56	214	21	01.39	15	991.79	4,874.25							
Rouasseur	93	35	41.45	42.50	300	49	45.56	15	996.05	4,875.55							
Jacques	43	11	42.92	42.94	77	37	14.58	23	317.12	7,100.99	44	18	05.28	100	02	08.00	
Jacques	78	18	59.35	58.54	77	37	14.58	23	317.12	7,106.99							
Narselles	49	48	20.55	29.15	307	22	05.16	29	028.05	8,847.06							
Fort George	51	52	31.16	32.31	179	18	18.64	22	541.76	6,901.15	44	14	21.71	100	02	04.22	
Jacques	74	01	54.74	53.53	359	18	18.01	22	641.76	6,901.15							
Fort George	70	23	54.88	56.66	249	42	15.36	37	422.12	11,406.16							
Chapelle Creek	35	34	07.32	09.81	105	22	01.84	36	668.63	11,176.50	44	16	29.61	99	54	01.86	
Fort George	77	58	31.71	38.41	249	42	15.36	37	422.12	11,406.16							
Chapelle Creek	68	05	28.65	29.63	1	42	21.95	65	568.10	19,984.97							
Cedar River	33	55	57.69	56.76	147	46	06.37	62	197.49	18,957.62	44	05	42.40	99	54	28.06	
Chapelle Creek	46	25	12.22	09.10	1	42	21.95	65	568.10	19,984.97							
Cedar River	48	07	00.93	01.32	229	49	04.82	47	646.82	14,522.62							
Reynolds	85	27	50.32	49.58	135	22	42.38	48	989.52	14,925.77	44	10	45.69	99	46	09.14	
Cedar River	61	22	48.44	49.50	229	49	04.82	47	646.82	14,522.62							
Reynolds	78	57	11.56	12.56	330	57	39.82	65	524.80	19,971.78							
Burnt Ridge	39	39		57.94	111	22	44.51	73	261.95	22,330.04	44	01	19.73	99	38	53.90	
Reynolds	42	45	13.76	15.78	330	57	39.82	65	524.80	19,971.78							
Burnt Ridge	47	51		22.35	198	54	05.21	44	484.35	13,558.70							
Neck	89	23	19.97	21.87	108	19	44.70	48	586.99	14,809.18	44	08	15.29	99	35	36.32	
Neck	57	36	11.00	11.31	108	19	44.70	48	586.99	14,809.18							
Reynolds	44	07	02.13	02.35	244	05	21.42	41	898.35	12,770.50							
Big Bend	78	16	46.11	46.34	345	54	35.77	34	543.06	10,528.63	44	13	46.16	99	37	31.62	
Neck	89	51	26.53	25.93	18	56	22.65	44	484.35	13,558.70							
Burnt Ridge	42	45	23.78	24.72	241	39	30.07	60	446.18	18,423.83							
Fort Thompson	47	23	10.92	09.35	109	11	06.48	41	036.36	12,507.77	44	06	02.46	99	26	44.92	
Burnt Ridge	44	40	58.88	58.63	241	39	30.07	60	446.18	18,423.83							
Fort Thompson	49	49	38.98	40.60	11	58	16.24	42	636.68	12,995.54							
Badger Creek	85	29	19.42	20.77	106	27	31.23	46	331.10	14,121.59	43	59	10.55	99	28	45.86	
Fort Thompson	68	31	49.89	48.91	11	58	16.24	42	636.68	12,995.54							
Badger Creek	58	02	30.54	30.77	249	59	23.08	49	405.81	15,058.75							
Wolf Creek	53	25	42.98	40.32	123	32	24.96	45	043.12	13,729.02	44	01	57.01	99	18	10.48	
Badger Creek	42	56	35.54	33.05	249	59	23.08	49	405.81	15,058.75							
Wolf Creek	58	50	25.31	25.90	11	16	18.58	34	382.93	10,479.82							
Bluff	78	13	02.27	01.15	113	02	13.53	43	187.96	13,163.57	43	56	24.00	99	19	42.32	
Bluff	68	42	49.91	48.48	113	02	13.53	43	187.96	13,163.57							
Badger Creek	33	58	29.89	28.58	326	54	24.89	41	248.82	12,572.52							
Fort Lookout	77	18	44.48	42.94	224	16	41.28	24	738.65	7,540.27	43	53	29.15	99	23	38.34	
Fort Lookout	72	28	03.36	03.81	224	16	41.28	24	738.65	7,540.27							
Bluff	62	02	34.63	83.73	342	16	51.19	33	079.11	10,082.42							
Frichard	45	28	24.01	22.46	116	49	03.92	30	641.99	9,339.59	43	51	12.80	99	17	24.94	
Frichard	97	11	42.18	42.84	116	49	03.92	30	641.99	9,339.59							
Fort Lookout	85	55	31.76	32.92	332	40	18.13	41	649.83	12,694.75							
Chamberlain	46	52	44.80	44.24	199	36	02.96	24	631.47	7,507.60	43	47	23.06	99	19	17.70	
Fort Lookout	48	42	00.36	00.14	332	40	18.13	41	649.83	12,694.75							
Chamberlain	65	37	51.16	51.68	87	05	26.87	34	340.02	10,466.74							
Brulé	65	40	08.03	08.18	201	19	55.13	41	637.35	12,690.96	43	47	06.18	99	27	05.15	

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TABLE VI.—*Tabulated results of secondary triangulation, etc.—Continued.*

Station.	Observed angle.			Adjusted angle.			Azimuth.			Distance.		Latitude.			Longitude.		
	°	'	"	°	'	"	°	'	"	Feet.	Metres.	°	'	"	°	'	"
Chamberlain	85	26	55.68	53.44	87	05	26.87	34,340.02	10,466.74								
Brulé	50	26	37.25	35.82	326	26	39.37	59,520.25	18,141.60								
Willrodt	35	06	32.13	30.74	181	38	19.43	51,416.62	15,671.64	43	38	56.08	99	19	37.74		
Brulé	47	22	10.18	09.01	326	26	39.37	59,520.25	18,141.60								
Willrodt	64	40	38.54	39.12	81	51	09.24	47,245.52	14,400.30								
Indian	67	57	11.76	11.87	193	46	38.40	58,045.63	17,692.15	43	37	49.46	99	30	13.57		
Willrodt	54	51	53.30	53.47	81	51	09.24	47,245.52	14,400.30								
Indian	64	14	19.36	29.10	325	58	10.73	44,220.51	13,478.29								
Rosebud	60	53	46.26	46.43	206	55	48.84	48,698.67	14,843.22	43	31	47.39	99	24	37.69		
Rosebud	70	55	36.99	37.26	206	55	48.84	48,698.67	14,843.22								
Willrodt	47	40	01.20	00.56	339	19	14.92	52,418.52	15,977.02								
Bijou	61	24	22.62	22.18	97	57	45.74	41,000.60	12,496.67	43	30	51.66	99	15	26.56		
Rosebud	41	00	55.82	54.75	277	51	26.24	41,000.60	12,496.67								
Bijou	50	14	46.58	46.40	47	42	59.26	29,913.55	8,203.17								
Durex	88	44	19.24	18.85	138	55	34.57	31,528.89	9,609.92	43	27	52.74	99	19	56.52		
Bijou	62	46	06.97	07.87	47	42	59.26	29,913.55	8,203.17								
Durex	80	37	14.04	14.62	308	17	08.29	49,127.15	12,230.64								
Brickkiln	36	36	35.33	37.51	164	58	39.02	44,525.41	13,571.22	43	23	46.97	99	12	49.96		
Bijou	39	03	46.70	45.48	344	56	51.32	44,525.41	13,571.22								
Brickkiln	66	14	01.20	00.36	231	12	39.48	29,089.02	8,866.25								
Heaton	74	42	14.82	14.16	125	58	24.95	42,245.97	12,876.45	43	26	46.83	99	07	42.65		
Brickkiln	63	83	03.50	02.87	231	12	39.48	29,089.02	8,866.25								
Heaton	45	48	02.45	01.85	5	28	08.78	37,430.67	11,408.76								
Cologne	50	33	56.55	55.28	134	53	40.28	27,001.26	8,229.91	43	20	38.83	99	08	30.92		
Heaton	58	30	01.01	01.26	5	28	08.78	37,430.67	11,408.76								
Cologne	56	21	31.15	31.29	241	49	06.99	35,174.07	10,720.96								
Boland	65	08	27.91	27.45	127	02	22.80	34,344.01	10,467.96	43	23	22.68	99	01	31.08		
Cologne	71	07	33.13	34.74	241	49	06.99	35,174.07	10,720.96								
Boland	57	10	40.20	39.32	4	43	15.85	42,412.83	12,927.31								
Hamilton	51	41	44.88	45.94	133	00	57.43	37,667.15	11,480.84	43	16	25.20	99	02	18.26		
Boland	57	18	54.16	56.06				4	43	15.85	42,412.83	12,927.31					
Hamilton	73	05	07.08	07.18	257	47	50.81	46,875.60	14,287.55								
Kyle	49	35	54.99	56.76	127	30	52.46	53,284.98	16,241.11	43	18	02.50	98	51	58.75		
Hamilton	46	16	13.80	12.87	257	47	50.81	46,875.60	14,287.55								
Kyle	45	18	08.84	10.10	32	36	45.36	33,885.34	10,328.16								
Mule Head	88	25	36.59	37.03	124	08	19.23	33,333.32	10,159.90	43	13	20.61	98	56	05.37		
Mule Head	67	31	11.64	10.60	212	33	56.35	33,885.34	10,328.16								
Kyle	57	02	46.58	46.14	335	33	59.13	38,022.27	11,589.08								
Wheeler	55	26	05.23	03.26	100	10	21.26	34,528.65	10,524.24	43	12	20.63	98	48	26.42		
Wheeler	88	25	07.67	08.42	100	10	21.26	34,528.65	10,524.24								
Mule Head	46	43	48.02	47.31	326	48	54.44	48,939.56	14,916.64								
Whetstone	44	51	04.24	04.27	191	44	05.81	35,647.79	10,865.35	43	06	35.91	98	50	04.30		
Whetstone	65	00	48.88	46.71	191	44	05.81	35,647.79	10,865.35								
Wheeler	77	12	33.15	31.72	294	32	40.00	52,743.93	16,076.20								
Leonard	37	46	39.81	41.57	76	53	21.91	56,746.25	17,296.10	43	08	43.72	98	37	39.33		
Leonard	50	22	57.74	57.87	76	53	21.91	56,746.25	17,296.10								
Whetstone	42	36	13.00	12.97	299	21	05.76	43,772.29	13,341.67								
Chicot	87	00	50.25	49.16	206	27	45.96	38,464.91	11,724.00	43	03	08.67	98	41	30.51		
Chicot	58	15	17.57	15.55	206	27	45.96	38,464.91	11,724.00								
Leonard	77	57	29.19	18.64	308	33	05.12	47,267.53	14,407.01								
White Swan	43	47	24.97	25.81	84	51	19.38	54,359.56	16,568.64	43	03	52.46	98	29	21.42		
White Swan	54	01	06.46	05.54	84	51	19.38	54,359.56	16,568.64								
Chicot	55	15	03.42	03.89	319	58	05.70	46,598.51	14,203.09								
Harrison	70	43	51.82	50.57	210	46	31.27	47,315.51	14,421.63	42	57	11.06	98	34	47.52		
White Swan	49	48	26.45	25.98	30	50	13.68	47,315.51	14,421.63								
Harrison	83	50	54.76	54.76	294	37	26.23	49,950.08	15,226.48								
Bruce	46	20	39.92	39.26	161	05	01.08	65,021.49	19,818.37	42	53	45.01	98	24	37.50		
Bruce	94	15	26.58	27.67	161	05	01.08	65,021.49	19,818.37								
White Swan	36	09	59.28	59.07	304	51	48.20	85,176.65	25,961.60								
Conger	49	34	32.19	33.26	75	27	55.22	50,404.43	15,393.13	42	55	50.48	98	13	42.00		
Conger	81	07	26.63	29.12	75	27	55.22	50,404.43	15,393.13								
Bruce	52	29	49.15	42.80	307	50	11.98	68,792.32	20,987.70								
Ponca	46	22	47.83	48.08	174	21	15.53	55,234.46	16,835.31	42	46	47.56	98	12	29.06		
Conger	40	42	50.51	46.86	354	20	25.86	55,234.46	16,835.31								
Ponca	32	55	35.68	36.00	207	16	51.62	37,548.03	11,444.54								
Chouteau	106	21	39.49	37.14	133	41	05.93	31,290.50	9,537.26	42	52	17.12	98	08	37.97		
Ponca	83	13	52.82	51.66	207	16	51.62	37,548.03	11,444.54								
Chouteau	40	08	54.64	53.42	347	10	35.20	44,651.70	13,609.71								
Ward	56	37	14.84	14.92	110	34	50.45	28,992.01	8,836.69	42	45	07.05	98	06	25.15		
Chouteau	35	13	10.91	10.32	347	10	35.20	44,651.70	13,609.71								
Ward	50	19	05.26	04.44	217	31	09.96	25,829.34	7,872.71								
Arneson	94	27	46.66	45.24	132	01	18.58	34,468.40	10,505.87	42	48	29.35	98	02	54.14		
Ward	02	13	02.81	03.20	217	31	09.96	25,829.34	7,872.71								
Arneson	77	34	16.48	16.85	319	59	16.34	35,395.97	10,788.59								
Niobrara	40	12	39.79	39.95	99	50	03.35	30,070.35	11,908.53	42	44	01.46	97	57	49.24		
Arneson	66	41	32.71	32.40	319	59	16.34	35,395.97	10,788.59								

TABLE VII.—Tabulated results of secondary triangulation from Running Water Base, South Dakota, to Blair, Nebraska.

[Azimuths and distances are in the order of stations, first to second, second to third, and third to first, in each triangle.]

Station.	Observed angle.			Adjusted angle.			Azimuth.			Distance.		Latitude.			Longitude.			
	°	'	"	'	"	"	°	'	"	Feet.	Meters.	°	'	"	°	'	"	
North Base	84	47	40.48	39.86	86	04	28.16	14,101.53	4,298.11									
South Base	33	33	18.40	18.37	249	36	28.94	15,957.15	4,963.70									
Lost Creek	61	39	02.44	01.77	131	17	46.91	8,556.66	2,609.49	42	46	56.68	97	54	03.94			
Kelly	91	32	54.36	55.39	267	38	14.45	8,463.33	2,579.60									
North Base	51	35	04.49	05.34	36	04	26.16	14,101.53	4,298.11	42	47	54.41	97	55	33.18			
South Base	36	51	58.72	59.27	179	11	11.29	11,052.99	3,368.92	42	46	01.81	97	57	24.49			
Kelley	91	35	58.40	59.08	289	58	06.34	16,080.87	4,901.40									
Lost Creek	38	31	31.01	30.56	148	31	54.67	21,022.40	6,407.57									
Covell	49	52	30.38	30.36	18	22	44.91	13,099.08	3,992.56	42	49	53.77	97	56	31.20			
Niobrara	39	16	51.47	52.25	184	09	19.47	23,297.40	7,100.98									
Kelley	74	11	27.90	28.47	289	58	08.34	16,080.87	4,901.40	42	47	50.98	97	57	26.60			
Lost Creek	66	31	39.72	39.28	43	28	44.00	24,438.45	7,448.77									
Covell	83	40	25.13	25.43	9	16	28.18	36,139.06	11,015.08									
Niobrara	53	58	56.84	58.52	243	14	33.70	53,326.23	16,253.09									
Santee	42	20	34.76	36.05	105	42	23.59	43,396.74	13,227.20	42	47	58.11	97	47	10.61			
Santee	48	26	25.62	25.66	105	42	23.59	43,396.74	13,227.20									
Crovell	52	01	06.45	06.75	233	34	53.78	33,021.05	10,064.72									
Springfield	79	32	24.99	25.59	334	06	30.83	34,784.06	10,602.09	42	53	07.24	97	50	34.33			
Springfield	58	15	38.72	38.81	334	06	30.83	34,784.06	10,602.09									
Santee	74	53	21.65	22.32	229	02	11.76	40,547.90	12,358.89									
Bon Homme	46	51	00.82	50 58 87	95	57	50.15	46,029.62	14,029.70	42	52	20.47	97	40	19.47			
Santee	40	37	18.51	16.68	229	02	11.76	40,547.90	12,358.89									
Bon Homme	80	05	54.26	53.11	349	00	58.09	26,867.86	8,189.25									
Herrick	79	16	51.74	50.21	89	44	54.49	35,774.44	10,903.95	42	47	59.94	97	39	10.81			
Bon Homme	89	44	11.84	13.34	349	00	58.09	26,867.86	8,189.25									
Herrick	50	42	31.72	31.91	219	44	16.74	42,191.18	12,859.75									
Lakeport	39	33	13.58	14.75	79	21	37.82	32,653.71	9,952.76	42	53	20.24	97	33	08.55			
Herrick	51	45	14.28	18.77	219	44	16.74	42,191.18	12,859.75									
Lakeport	55	28	49.05	50.67	344	19	32.31	34,692.98	10,574.33									
Pit	72	45	54.28	55.56	91	85	02.12	36,397.07	11,093.72	42	47	50.29	97	31	02.84			
Lakeport	47	25	02.67	23.85	344	19	32.31	34,692.98	10,574.33									
Pit	102	41	47.12	45.51	267	02	43.29	50,377.16	15,354.82									
Schmidt	30	15	49.36	50.64	117	26	12.66	67,154.25	20,468.43	42	48	15.38	97	19	48.03			
Pit	39	37	53.91	53.05	267	02	43.29	50,377.16	15,354.82									
Schmidt	97	09	33.39	34.29	184	19	56.53	46,932.51	14,304.90									
Welby	43	12	31.95	32.66	47	33	01.62	73,005.71	22,251.93	42	55	57.63	97	19	00.38			
Schmidt	99	15	17.78	17.73	184	19	56.53	46,932.51	14,304.90									
Welby	44	49	55.91	56.55	319	20	32.20	78,972.82	24,070.69									
How Creek	35	54	48.55	45.72	103	43	33.92	56,412.95	17,194.51	42	46	03.82	97	07	32.98			
Welby	37	03	49.62	48.76	319	30	32.20	78,972.82	24,070.69									
Bow Creek	89	27	24.67	24.18	229	05	44.21	59,226.33	18,052.02									
Spirit Mound	53	28	47.26	47.06	102	41	20.16	98,263.70	29,930.50	42	52	26.44	96	57	31.90			
Bow Creek	60	30	29.40	29.25	229	05	44.21	59,226.33	18,052.02									
Spirit Mound	57	10	47.02	47.09	342	01	45.37	65,144.39	19,855.83									
Ryan	62	18	43.67	43.66	109	46	04.53	68,983.83	21,026.08	42	42	14.28	96	53	02.74			
Spirit Mound	55	59	48.69	48.85	342	01	45.37	65,144.39	19,855.83									
Ryan	67	47	40.30	39.30	229	52	27.79	64,962.78	19,806.57									
Johnson	56	12	33.18	31.85	106	12	32.52	72,572.43	22,119.88	42	49	07.40	96	41	56.13			
Ryan	69	26	14.98	14.81	229	52	27.79	64,962.78	19,806.57									
Johnson	32	49	01.51	00.78	17	10	59.41	62,261.43	18,977.11									
Ionia	77	44	44.05	44.41	119	23	27.96	36,039.02	10,964.59	42	39	19.78	96	46	02.25			
Johnson	55	52	41.77	40.93	17	10	59.41	62,261.43	18,977.11									
Ionia	61	21	24.28	21.98	258	29	34.62	57,969.17	17,668.84	42	41	13.31	96	33	21.77			
Westfield	62	45	58.02	57.09	141	24	07.37	61,454.21	18,731.07									
Ionia	64	12	11.08	10.72	258	29	34.62	57,969.17	17,668.84									
Westfield	46	00	52.71	52.87	32	37	16.97	55,619.03	16,952.53									
Triloba	69	46	57.14	56.41	142	45	49.32	44,448.57	13,547.80	42	33	30.39	96	40	02.36			
Westfield	58	19	09.77	11.81	32	37	16.97	55,619.03	16,952.53									
Triloba	33	09	11.12	11.79	245	41	57.63	47,347.19	14,431.29									
Hall	88	31	33.51	36.40	154	20	04.58	30,427.03	9,274.07	42	36	42.45	96	30	25.34			
Triloba	75	36	34.44	32.72	245	41	57.63	47,347.19	14,431.29									
Hall	37	54	40.35	39.27	27	53	48.68	50,017.01	15,245.05									
Round Cap	66	28	48.74	48.01	141	21	29.48	31,727.75	9,670.53	42	29	25.68	96	35	37.66			
Hall	42	21	09.87	11.08	27	53	48.68	50,017.01	15,245.05									
Round Cap	55	24	29.56	28.26	263	14	45.86	34,007.90	10,365.51									
Emerson	82	14	20.13	20.06	165	34	11.13	41,555.36	12,685.96	42	30	04.95	96	28	06.87			
Round Cap	71	23	22.40	21.35	263	14	45.86	34,007.90	10,365.51									
Emerson	73	30	48.22	48.32	9	49	01.89	56,054.77	17,085.34									
Baird	83	05	51.18	50.33	154	41	45.71	56,715.90	17,286.85	42	30	59.31	96	30	14.14			
Emerson	53	00	30.94	32.47	9	49	01.89	56,054.77	17,085.34									
Baird	52	38	25.43	24.48	242	26	00.69	46,496.27	14,171.94									
Sergeants	74	21	03.25	03.05	186	53	14.16	46,269.71	14,102.88	42	24	31.50	96	21	04.78			
Baird	68	31	34.56	34.57	242	26	00.69	46,496.27	14,171.94									