

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

CHARLES D. WALCOTT, DIRECTOR

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RESULTS

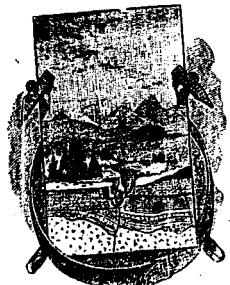
OF

PRIMARY TRIANGULATION AND
PRIMARY TRAVERSE

FISCAL YEAR 1905-6

BY

SAMUEL S. GANNETT



WASHINGTON
GOVERNMENT PRINTING OFFICE

1907

top, incased in brickwork 18 inches below surface. Two were in line to the Yolo northwest base at a distance of 18 feet $11\frac{1}{16}$ inches and 327 feet 10 inches from the center, and two were in line at right angles thereto eastward at a distance of 20 feet five-eighths of an inch and 328 feet $5\frac{1}{16}$ inches from the center.

[Latitude $38^{\circ} 41' 42.135''$. Longitude $121^{\circ} 47' 58.18''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	''	°	'	''	
Vaca.....	55	40	13.77	235	38	37.32	Meters. 4.4775212
Diablo.....	7	56	54.56	137	52	41.08	4.8599088
Monticello.....	114	01	55.20	233	47	19.46	4.5700850
Scott.....	129	16	42.54	309	13	59.56	3.9126286
Stevens.....	135	45	42.12	315	33	36.12	4.6043065
Yolo northwest base.....	163	07	18.98	343	05	07.93	4.2427032
Green.....	175	23	17.56	355	23	03.21	3.6546895
Hines.....	182	49	52.57	2	50	01.03	3.8262855
Davisville.....	252	27	52.57	72	30	06.51	3.7373120

MARIPOSA AND TUOLUMNE COUNTIES.

YOSEMITE SPECIAL QUADRANGLE.

For the control of this special quadrangle Charles F. Urquhart, topographer, extended triangulation control from Pilot Peak and Devil Peak in 1905. Twelve stations, controlling an area of 100 square miles, were located on the United States standard datum.

CLOUDS REST, MARIPOSA COUNTY.

On the highest point of Clouds Rest, a well-known mountain at the northeast corner of the Yosemite State Park. There is a good trail from the Yosemite Valley to the summit of the mountain. Animals can be taken within 200 feet (elevation) of top.

Signal: A cairn 5 feet high, built of large, flat rocks.

Station mark: A copper bolt set in rock very near and west of cairn.

[Latitude $37^{\circ} 46' 05.53''$. Longitude $119^{\circ} 29' 13.97''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	''	°	'	''	
Starr King.....	19	04	06.99	199	03	94.76	Meters. 3.8821831
Devil Peak.....	40	00	43.66	219	51	32.39	4.5381966
Sentinel Dome.....	50	21	29.37	239	17	59.94	3.9884338
Glacier Point.....	61	00	29.03	240	57	23.16	3.9293950
Eagle.....	77	39	36.31	257	34	59.30	4.0537206
Yosemite Point.....	82	00	09.13	261	56	19.34	3.9663925
Flat.....	107	11	17.36	287	05	27.92	4.1644432

DEVIL PEAK, MARIPOSA COUNTY.

At the southeast end of a short, sharp ridge, 9 miles southwest of Wawona Park, bare on top and covered with loose rock. Ascended by wagon road from Wawona. Nearest camping place is $1\frac{1}{4}$ miles northeast of summit.

Station mark: A cairn 4 feet in diameter at the base, $4\frac{1}{2}$ feet high, on site of old monument, 5.6 feet west of "U. S. G. S." chiseled on rock (Urquhart, 1905). Cairn could not be found, but rock with "U. S. G. S." was found, and point used was within 2 or 3 feet of old point.

[Latitude $37^{\circ} 31' 46.79''$. Longitude $119^{\circ} 44' 23.09''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	''	°	'	''	
Cottonwood.....	180	37	19.76	00	37	31.81	Meters. 4.6445464
Hoffman.....	209	50	37.68	29	50	03.70	4.6092431
Conness.....	217	07	08.88	37	22	32.54	4.7855484
Clarks Peak.....	235	55	55.04	56	07	20.30	4.5212361
Red.....	244	35	09.78	64	47	16.70	4.5097490
Kaiser.....	267	47	02.53	118	07	16.04	4.7451616
Big Shuteye.....	305	41	47.10	125	53	10.71	4.5325137
Bullion Mount.....	96	31	08.21				4.4740000
Pilot.....	146	23	49.18	326	16	39.63	4.4928478
Flat.....	194	51	35.15	14	54	59.19	4.5030993
Clouds Rest.....	219	51	32.29	40	00	43.66	4.5381966

DEWEY, MARIPOSA COUNTY.

On the bluff overlooking the Yosemite Valley, on south side of the valley and west of Bridal Veil Creek. It can be reached by trail either from Glacier Point or Fort Monroe. Distance from Fort Monroe to station is about 4 miles. Trail is known as Pohono trail.

Signal: A small ~~for~~ tree placed in a crack in the rock with rock piled around its base.

Station mark: A triangulation tablet cemented in rock at the foot of tree.

[Latitude $37^{\circ} 42' 16.03''$. Longitude $119^{\circ} 39' 06.31''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	''	°	'	''	
El Capitan.....	201	24	41.54	21	25	14.24	Meters. 3.5544804
Eagle.....	215	33	40.67	35	35	03.79	3.7572066
Sentinel Dome.....	250	37	44.55	70	40	14.60	3.8039652

EAGLE, MARIPOSA COUNTY.

On the summit of Eagle Peak, a well-known point on the north side of Yosemite Valley. There is a good trail known as the Yosemite Point and Eagle Peak trail from the valley to station.

Signal: An iron rod about 4 feet high set in rock. It is necessary to have a flag of some kind on rod.

Station mark: A triangulation tablet cemented in rock at foot of rod.

[Latitude 37° 44' 46.90". Longitude 119° 36' 50.46".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	
	<i>Meters.</i>						
Dewey.....	35	35	03.79	215	33	40.67	3.7572966
El Capitan.....	56	55	46.25	236	54	55.83	3.3815937
Yosemite Point.....	239	01	46.76	59	02	33.99	3.3428995
Clouds Rest.....	257	34	59.80	77	39	36.31	4.0537206
Valley.....	275	40	32.04	95	41	26.92	3.3435984
Glacier Point.....	295	05	15.94	115	06	46.50	3.6021166
Sentinel Dome.....	313	28	34.14	133	29	41.12	3.5674215

EL CAPITAN, MARIPOSA COUNTY.

(Not occupied.)

On the highest point of El Capitan, nearest the bluff. The Eagle Peak trail continues on to this mountain.

Station mark: A cairn on highest point.

[Latitude 37° 44' 04.28". Longitude 119° 38' 12.86".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	
	<i>Meters.</i>						
Eagle.....	236	54	55.83	56	55	46.25	3.3815907
Sentinel Dome.....	284	37	43.60	104	39	40.99	3.6862312
Dewey.....	21	25	14.24	201	24	41.54	3.5544804

FLAT, MARIPOSA COUNTY.

On the summit of a flat-topped rocky peak at the source of West Fork of Yosemite Creek and about 5 miles from junction of Eagle Peak and Yosemite Point trails. There is no trail at this point, but animals can be taken to foot of peak. The south side is probably the easiest to climb. About 300 feet inaccessible for animals.

Signal: A cairn with dead tree inside of it.

Station mark: A triangulation tablet set in rock under the cairn.

[Latitude 37° 48' 25.17". Longitude 119° 38' 49.20".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	
	<i>Meters.</i>						
Devil Peak.....	14	54	59.19	194	51	35.15	4.5030993
Pilot.....	79	10	59.75	259	00	24.24	4.4124128
Clouds Rest.....	287	05	27.92	107	11	17.36	4.1644432
Starr King.....	315	03	17.42	135	08	04.35	4.2108574
Yosemite Point.....	319	24	08.84	139	26	08.84	3.8673813
Sentinel Dome.....	328	54	57.80	148	57	17.54	4.0343607

GLACIER POINT, MARIPOSA COUNTY.

At the east end of iron railing at Glacier Point, a well-known point on the south side of Yosemite Valley. There is a good trail known as the Glacier Point trail from the valley to the station.

Signal: A pole about 25 feet high set in rock.

Station mark: A triangulation tablet set in rock.

[Latitude 37° 43' 51.85". Longitude 119° 34' 22.50".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	
	<i>Meters.</i>						
Eagle.....	115	06	46.50	235	05	15.94	3.6021166
Valley.....	136	00	48.03	316	00	12.34	3.3128510
Yosemite Point.....	148	30	53.24	328	30	09.80	3.5210068
Clouds Rest.....	240	57	23.16	61	00	29.03	3.9293950

PILOT PEAK, MARIPOSA AND TUOLUMNE COUNTIES.

On boundary of Mariposa and Tuolumne counties. Rose's ranch is 2.5 miles east.

Station mark: A new cairn with tree in it was built and the greater portion of brush cut. Triangulation tablet set in loose rock and a flat rock with a cross cut on it placed immediately over it. The tree in center of cairn is over center of cross.

[Latitude 37° 45' 46.57". Longitude 119° 56' 06.42".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	
	<i>Meters.</i>						
Flat.....	259	00	24.24	79	10	59.75	4.4124128
Sentinel Dome.....	277	56	30.06	98	09	24.64	4.4953983
Devil Peak.....	326	16	39.63	146	23	49.18	4.4928478
Moccasin Peak.....	97	52	44.00	277	38	19.00	4.5424039
Big Canyon.....	144	46	11.00	324	39	25.00	4.4473833

SENTINEL DOME, MARIPOSA COUNTY.

On the summit of Sentinel Dome, a well-known peak on the south side of Yosemite Valley. The Glacier Point trail continues south and west along the bluff to Fort Monroe. This trail passes Sentinel Dome about 1 mile from Glacier Point Hotel.

Signal: The trunk of a tree with large spreading top.

Station mark: A triangulation tablet set in rock under center of signal tree. The tree stands above anything else on mountain.

[Latitude 37° 43' 24.46". Longitude 119° 35' 01.02".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	
	<i>Meters.</i>						
Dewey.....	70	40	14.60	250	37	44.55	3.8039652
Pilot.....	98	09	24.64	277	56	30.06	4.4953983
El Capitan.....	104	39	40.99	284	37	43.60	3.6862312
Clouds Rest.....	133	29	41.12	313	28	34.14	3.5674215
Eagle.....	148	57	17.54	328	54	57.80	4.0343607
Flat.....	167	51	35.66	347	51	15.89	3.5750603
Yosemite Point.....	239	17	59.94	59	21	29.37	3.9884838
Clouds Rest.....	290	47	27.31	110	49	54.39	3.7993631
Starr King.....							

STARR KING, MARIPOSA COUNTY.

(Not occupied.)

Station is on highest point of Mount Starr King, a well-known mountain on the southeast side of Yosemite Valley. Very difficult to climb.

Station mark: Cairn on the summit.

[Latitude 37° 42' 11.86". Longitude 119° 31' 00.58".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Sentinel Dome.....	110	49	54.39	290	47	27.31	3.7992631
Flat.....	135	08	04.35	315	03	17.42	4.2108574
Clouds Rest.....	199	03	04.76	19	04	06.99	3.8821831

VALLEY, MARIPOSA COUNTY.

In the Yosemite Valley, on the north side of junction of roads to Camp Yosemite and Mirror Lake and about 50 yards from bridge over Merced River, near the Sentinel Hotel. Signal is a 4 by 4 inch post set in ground, with signboard pointing to Mirror Lake on it. Another board at right angles to signboard and post.

Station mark: A concrete pier 2½ feet high, 20 by 20 inches at base, 12 by 12 inches at top, in the top of which was placed an aluminum plug marked "U. S. G. S. B. M.," over which was placed an aluminum plate, one-half inch thick by 4½ inches wide, 7 inches long, engraved as follows:

U. S. Geological Survey,
 Charles D. Walcott, Director,
 Latitude 37° 44' 40"
 Longitude 119° 35' 21"
 Elevation above sea, 3,960 feet,
 1095.

[Latitude, 37° 44' 39.81". Longitude, 119° 35' 20.80".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Eagle.....	95	41	26.92	275	40	32.04	3.3435984
Yosemite Point.....	167	13	43.08	347	13	35.42	3.1417253
Glacier Point.....	316	00	12.34	136	00	48.03	3.3128519

YOSEMITE POINT, MARIPOSA COUNTY.

At the west end of iron railing on Yosemite Point, a well-known point overlooking Yosemite Valley. There is a good trail known as the Yosemite Point and Eagle Peak trail to station. The pole is not straight, so the part at top of railing was sighted.

Station mark: A triangulation tablet cemented in rock at foot of pole.

[Latitude, 37° 45' 23.65". Longitude, 119° 35' 33.31".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Eagle.....	50	02	33.99	239	01	46.76	3.3428995
Flat.....	139	26	08.84	319	24	08.84	3.8673813
Clouds Rest.....	261	56	19.84	82	09	09.13	3.9663925
Glacier Point.....	328	30	09.89	148	30	53.24	3.5210068
Valley.....	347	13	35.42	167	13	43.08	3.1417253
Sentinel Dome.....	347	51	15.89	167	51	35.60	3.5750003

CALIFORNIA—NEVADA.

TRIANGULATION STATIONS.

ESMERALDA AND NYE COUNTIES, NEV.; INYO COUNTY, CAL.

AMARGOSA REGION.

During the field season of 1905-6 triangulation control was extended over a large part of southern Nye County, Nev., and a small area adjacent to Death Valley, in Inyo County, Cal., by R. H. Chapman and B. D. Stewart, topographers. The work was more of a reconnaissance than a standard nature and was done in connection with topographic surveys, which were carried on rapidly. The foresights were made to the natural points selected, and signals were erected when the points were occupied for observations. The stations were marked and signals erected according to regulations of the Survey. The instruments used were the standard 8-inch theodolites reading to 2 seconds of arc.

The scheme was carried forward from the line Lone Mountain-Montezuma, the first a primary and the second a secondary or tertiary point of the United States Coast and Geodetic Survey. The value of this base is taken from finally adjusted figures in the scheme brought from points in California during 1905 by Mr. Urquhart. The initial position is that given for Lone Mountain by the Coast Survey, and is on the United States standard datum.

Figures were extended about 1½° eastward from Lone Mountain and tied to the secondary Coast Survey point Kawich, which was occupied, and by long, unclosed sights to the primary point White Pine.

From these figures the scheme was carried southward to the Death Valley region and tied to triangulation points Grape and Nye, established by the Coast Survey in connection with the survey of the Nevada-California oblique boundary.

In all cases the preliminary positions, azimuths, and distances agreed so closely with those given by the Coast Survey that no figure adjustment was made, it being considered that the preliminary