

Bulletin No. 245

Series F, Geography, 43

DEPARTMENT OF THE INTERIOR  
UNITED STATES GEOLOGICAL SURVEY

CHARLES D. WALCOTT, DIRECTOR

LIBRARY  
GEOLOGICAL SCIENCES  
California Institute of Technology

RESULTS

OF

PRIMARY TRIANGULATION AND PRIMARY TRAVERSE

FISCAL YEAR 1903-04

BY

SAMUEL S. GANNETT



WASHINGTON  
GOVERNMENT PRINTING OFFICE

1904

metadc304104





DEPARTMENT OF THE INTERIOR  
UNITED STATES GEOLOGICAL SURVEY

CHARLES D. WALCOTT, DIRECTOR

---

RESULTS

OF

PRIMARY TRIANGULATION AND PRIMARY TRAVERSE

FISCAL YEAR 1903-04

BY

SAMUEL S. GANNETT



WASHINGTON  
GOVERNMENT PRINTING OFFICE  
1904





## CONTENTS.

---

	Page.
Letter of transmittal .....	15
Summary .....	17
Eastern division of topography .....	18
Alabama .....	18
Primary traverse .....	18
Blount, Jefferson, and St. Clair counties; Birmingham quadrangle.	18
Georgia .....	24
Primary traverse .....	24
Elbert, Lincoln, McDuffie, Oglethorpe, Taliaferro, and Wilkes counties; Wilkes quadrangle .....	24
Illinois-Indiana .....	28
Primary traverse .....	28
Gallatin and White counties, Illinois, Posey County, Indiana; Newhaven quadrangle .....	28
Illinois .....	29
Primary traverse .....	29
Gallatin, Hamilton, Saline, and White counties; Eldorado quadrangle .....	29
Kansas .....	31
Primary traverse .....	31
Montgomery, Neosho, and Wilson counties; Independence quadrangle .....	31
Kentucky .....	37
Primary traverse .....	37
Anderson, Fayette, Franklin, Grant, Henry, Owen, Scott, and Woodford counties; Frankfort quadrangle .....	37
Davies, Henderson, and Ohio counties; Calhoun and Sutherland quadrangles .....	45
Union and Webster counties; Sebree quadrangle .....	47
Louisiana .....	50
Primary traverse .....	50
East and West Baton Rouge, East and West Feliciana, and Pointe Coupee parishes; Bayou Sara quadrangle .....	50
Maryland .....	53
Primary traverse .....	53
Caroline and Queen Anne counties; Barclay quadrangle .....	53
Caroline and Talbot counties; Denton quadrangle .....	55
Anne Arundel, Howard, Montgomery, and Prince George counties; Laurel quadrangle .....	56
Anne Arundel County; Relay quadrangle .....	59
Michigan .....	60
Primary traverse .....	60
Macomb and Oakland counties; Detroit quadrangle .....	60
Missouri .....	61
Primary traverse .....	61
St. Louis County; St. Louis quadrangle .....	61

Eastern division of topography—Continued.	Page.
Illinois .....	63
Primary traverse .....	63
Madison and St. Clair counties; St. Louis quadrangle .....	63
Missouri .....	65
Primary traverse .....	65
Jefferson, St. Francois, Ste. Genevieve, and Washington counties; Bonneterre and Farmington quadrangles .....	65
St. Francois and Ste. Genevieve counties; Farmington quadrangle .....	69
Washington County; Potosi quadrangle .....	70
New York .....	72
Triangulation stations .....	72
Allegany County; Belfast quadrangle .....	72
Belfast, Allegany County .....	72
Davis, Allegany County .....	72
Gordon, Allegany County .....	73
Lowe, Allegany County .....	73
Primary traverse .....	73
Erie, Genesee, and Wyoming counties; Attica quadrangle .....	73
Erie County; Depew quadrangle .....	75
Oneida and Oswego counties; Mexico and Kasoag quadrangles .....	77
St. Lawrence County; Brierhill, Massena, Ogdensburg, and Wad- dington quadrangles .....	80
North Dakota .....	84
Primary traverse .....	84
Ransom, Richland, and Sargent counties; Wyndmere quadrangle .....	84
North Dakota—Minnesota .....	87
Primary traverse .....	87
Cass and Richland counties, N. Dak., and Clay and Wilkie counties, Minn.; Fargo quadrangle .....	87
Cass and Traill counties, N. Dak., and Norman County, Minn.; Hillsboro quadrangle, N. Dak., and Ada quadrangle, Minn.—N. Dak .....	90
Ohio .....	94
Primary traverse .....	94
Ashtabula County; Andover and Jefferson quadrangles .....	94
Medina and Summit counties; Akron and Medina quadrangles .....	97
Cuyahoga, Geauga, and Lake counties; Mentor and Painesville quadrangles .....	99
Allen, Auglaize, Butler, Clark, Clinton, Darke, Fayette, Franklin, Greene, Hamilton, Madison, Mercer, Miami, Montgomery, Preble, Van Wert, and Warren counties; Brookville, Celina, Dayton, Greenville, Hamilton, London, Lima, Mason, Middle- town, St. Henry, South Charleston, Springfield, Van Wert, West Manchester, and Wilmington quadrangles .....	101
Madison County; London quadrangle .....	106
Butler and Hamilton counties; Hamilton and Mason quad- rangles .....	107
Darke, Miami, Montgomery, and Preble counties; Brookville quadrangle .....	108
Miami and Montgomery counties; Dayton quadrangle .....	109
Darke County; Greenville quadrangle .....	110
Allen and Auglaize counties; Lima quadrangle .....	112



	Page.
Eastern division of topography—Continued.	
Ohio—Continued.	
Primary traverse—Continued.	
Allen, Auglaise, Butler, Clark, etc.—Continued.	
Butler, Montgomery, Preble, and Warren counties; Middle-	
town quadrangle .....	114
Darke and Mercer counties; St. Henry quadrangle .....	115
Clark, Fayette, Green, and Madison counties; South Charles-	
ton quadrangle .....	117
Clark and Greene counties; Springfield quadrangle .....	119
Darke and Preble counties; West Manchester quadrangle ...	120
Clinton and Warren counties; Wilmington quadrangle.....	122
Pennsylvania .....	125
Triangulation stations .....	125
Allegheny, Westmoreland, and Armstrong counties; Freeport and	
Sharpsburg quadrangles .....	125
Bakerstown, Allegheny County .....	125
Christy, Allegheny County .....	126
Heverline, Allegheny County .....	126
Indian, Allegheny County .....	127
McKelvey, Allegheny County .....	127
Natrona, Allegheny County .....	128
Shrader, Armstrong County .....	128
Clearview, Westmoreland County .....	129
McGinnis, Westmoreland County .....	129
Rose, Westmoreland County .....	130
Steele, Westmoreland County .....	130
Yeter, Westmoreland County .....	130
Primary traverse .....	131
Berks, Chester, and Lancaster counties; Suplee quadrangle.....	131
Chester County; Coatesville quadrangle .....	133
Chester County; Phoenixville quadrangle .....	135
Crawford County; Linesville quadrangle .....	137
Vermont—New York .....	139
Triangulation stations .....	139
Chittenden County, Vt., and Essex County, N. Y.; Burlington	
and Milton quadrangles .....	139
Bigelow, Essex County, N. Y. ....	140
Burlington Tower, Chittenden County, Vt .....	140
Burlington University, Chittenden County, Vt .....	140
Essex Center Church, Chittenden County, Vt .....	141
Essex Junction Church, Chittenden County, Vt .....	141
Fort Ethan Allen, Chittenden County, Vt .....	141
Holmes, Chittenden County, Vt .....	142
Yantz, Chittenden County, Vt .....	142
Milton, Chittenden County, Vt .....	143
Philo, Chittenden County, Vt .....	143
Virginia .....	143
Primary traverse .....	143
Gloucester and King and Queen counties; Williamsburg quad-	
rangle .....	143
Isle of Wight and Surry counties; Jamestown and Yorktown quad-	
rangles .....	145

	Page.
Eastern division of topography—Continued.	
West Virginia.....	147
Triangulation stations .....	147
Jackson, Mason, Putnam, Roane, Tyler, Wirt, and Wood counties; Elizabeth, Millwood, New Martinsville, and Winfield quad- rangles .....	147
Balis, Jackson County .....	147
Foster Chapel, Jackson County.....	148
Garnes, Jackson County .....	148
Pleasant Hill Church, Jackson County.....	149
Reynolds, Jackson County .....	149
Sayre, Jackson County.....	150
Clarks Knob, Jackson-Mason County line.....	151
Finlay, Mason County .....	151
Kennard, Mason County.....	151
Blake Knob, Putnam County .....	152
Henderson, Putnam County .....	152
Honaker, Putnam County .....	153
Jividen, Putnam County.....	153
McKee, Putnam County .....	154
Staats, Roane County.....	154
Pollock, Tyler County.....	154
Smith, Tyler County .....	155
Tree E, Tyler County.....	155
Elizabeth, Wirt County.....	156
Jephany, Wirt County.....	156
Ruble, Wirt County .....	156
Weed, in Wirt, Jackson, and Roane counties .....	157
Williams, Wirt County .....	157
Windy, Wirt County .....	158
Freed, Wood County .....	158
Goff, Wood County .....	159
Mount Carmel Church, Wood County.....	159
Pinnacle, Wood County .....	160
Swearingen, Wood County .....	160
Wisconsin .....	161
Primary traverse .....	161
Columbia and Dodge counties; Beaverdam and Doylestown quad- rangles .....	161
Dodge County; Beaverdam quadrangle .....	161
Columbia County; Doylestown quadrangle .....	163
Western division of topography .....	165
Arizona.....	165
Triangulation stations .....	165
Cochise, Pima, Pinal, and Santa Cruz counties; Nogales, Patago- nia, Tombstone, and Tucson quadrangles .....	165
Ajax, Cochise County .....	165
Comstock, Cochise County.....	166
Mineral monument No. 6, Cochise County .....	166
Schieffelin, Cochise County .....	166
Stonewhet, Cochise County .....	166
Empire, Pima County .....	167
Fagan, Pima County.....	167



## Western division of topography—Continued.

Page.

## Arizona—Continued.

## Triangulation stations—Continued.

## Cochise, Pima, Pinal, and Santa Cruz counties, etc.—Continued.

Hopkins, Pima County .....	168
Kellogg, Pima County .....	168
Pantano railroad station, Pima County .....	168
Pusch, Pima County .....	169
Rincon, Pima County .....	169
Samaniego, Pima County .....	169
San Xavier Mission, Pima County .....	170
Sonoita section house, Pima County .....	170
Tortollitas, Pima County .....	170
Tucson Court-house, Pima County .....	171
Tucson, South Meridian station, Pima County .....	171
Tucson standpipe, Pima County .....	171
Vails, Pima County .....	172
Warner, Pima County .....	172
Wasson, Pima County .....	172
Rice, Pima, and Pinal counties .....	173
Black, Pinal County .....	173
Picacho, Pinal County .....	174
Baldy, Santa Cruz County .....	174
Benedict, Santa Cruz County .....	175
Cayetano, Santa Cruz County .....	175
Monument No. 121, Santa Cruz County .....	176
Mustang, Santa Cruz County .....	176
Red, Santa Cruz County .....	176
Santa, Santa Cruz County .....	177
Washington, Santa Cruz County .....	177
Coconino and Mohave counties, Grand Canyon Forest Reserve ..	177
Apache, Coconino County .....	177
Bass, Coconino County .....	178
Cane, Coconino County .....	178
Cardenas, Coconino County .....	179
Cataract, Coconino County .....	179
Chapin, Coconino County .....	180
Coconino, Coconino County .....	180
Comanche, Coconino County .....	180
Desert, Coconino County .....	181
Elliott, Coconino County .....	181
Final, Coconino County .....	182
Floyd, Coconino County .....	182
Fossil, Coconino County .....	183
Hollenbeck, Coconino County .....	183
Kendrick, Coconino County .....	184
Millett, Coconino County .....	184
North Canyon, Coconino County .....	185
Oliver, Coconino County .....	185
Red Butte, Coconino County .....	185
Rowe, Coconino County .....	186
Royal, Coconino County .....	186
Saddle, Coconino County .....	187
Shinumo, Coconino County .....	187

	Page.
Western division of topography—Continued.	
Arizona—Continued.	
Triangulation stations—Continued.	
Coconino and Mohave counties, etc.—Continued.	
Sublime, Coconino County .....	188
Supai, Coconino County .....	188
Phillips, Mohave County .....	189
Maricopa and Yavapai counties .....	189
Pyramid, Maricopa County .....	189
Syenite, Maricopa County .....	190
Boulder Pass, Yavapai County .....	190
Del Pasco, Yavapai County .....	190
Mount Union, Yavapai County .....	191
New River, Yavapai County .....	191
Silver, Yavapai County .....	191
Squaw Peak, Yavapai County .....	192
Maricopa County, secondary positions .....	192
Yavapai County, secondary positions .....	193
Secondary triangulation stations .....	193
Cochise County; Bisbee quadrangle .....	193
Bisbee West, Cochise County .....	193
Boundary monument No. 91, Cochise County .....	193
Boundary monument No. 93, Cochise County .....	194
Calumet and Arizona flag, Cochise County .....	194
Center flag, Cochise County .....	194
Don Louis, Cochise County .....	195
Johnson No. 3, Cochise County .....	195
Lime, Cochise County .....	196
Mineral monument No. 2, Cochise County .....	196
Mineral monument No. 3, Cochise County .....	196
Naco Junction, Cochise County .....	197
Red Hill, Cochise County .....	197
California .....	197
Triangulation stations .....	197
Kern County .....	197
Bakersfield, Kern County .....	198
Beale, Kern County .....	198
Breckinridge, Kern County .....	198
Jewetta, Kern County .....	199
Lakeview, Kern County .....	199
Oil, Kern County .....	199
Oldtown, Kern County .....	200
Pampa, Kern County .....	200
Rankin, Kern County .....	200
Round, Kern County .....	201
Primary traverse .....	201
Colusa, Tehama, and Yolo counties, Arbuckle, Norman, Tehama, Vina, and Willow quadrangles .....	201
Colorado .....	207
Triangulation stations .....	207
Boulder, Clear Creek, Gilpin, and Jefferson counties; Central and Georgetown quadrangles .....	207
South Boulder, Boulder County .....	207
Chief, Clear Creek County .....	207



Western division of topography—Continued.	Page.
Colorado—Continued.	
Triangulation stations—Continued.	
Boulder, Clear Creek, Gilpin, and Jefferson counties, etc.—Cont'd.	
Democrat, Clear Creek County .....	208
Grindal, Clear Creek County .....	208
Douglas, Gilpin County .....	209
Central, on Gilpin-Clear Creek county line .....	209
Kingston, on Gilpin-Clear Creek county line .....	209
Bergen, Jefferson County .....	210
Legault, Jefferson County .....	210
Morrison, Jefferson County .....	211
Sheepshead, Jefferson County .....	211
Table Mountain, Jefferson County .....	212
Gunnison, Hinsdale, and Ouray counties; Lake City quadrangle ..	212
Alpine, Gunnison County .....	212
Lake, Hinsdale County .....	213
No. 5, Hinsdale County .....	213
Rio Grande Pyramid, Hinsdale County .....	213
Sherman, Hinsdale County .....	214
Tabasco, Hinsdale County .....	214
Uncompahgre, Hinsdale County .....	215
Sneffels, Ouray County .....	215
Montana .....	215
Triangulation stations .....	215
Choteau and Valley counties; Assiniboine, Bowdoin, Chinook,	
Dodson, Glasgow, Harlem, Havre, Hinsdale, Saco, Wayne	
Creek, Yantic, and other quadrangles .....	215
Belknap, Choteau County .....	216
Big Sandy, Choteau County .....	216
Boundary post No. 318, Choteau County .....	217
Box Elder, Choteau County .....	217
Box Elder schoolhouse, Choteau County .....	217
Burnham, Choteau County .....	218
Chain, Choteau County .....	218
Chinook, Choteau County .....	218
Chinook schoolhouse, Choteau County .....	219
Coburg water tank, Choteau County .....	219
Cone, Choteau County .....	219
Dodson, Choteau County .....	219
East Base, Choteau County .....	220
East Belknap, Choteau County .....	220
East Cherry, Choteau County .....	220
Eureka, Choteau County .....	221
Fifteenmile, Choteau County .....	221
Fogerty, Choteau County .....	222
Forks, Choteau County .....	222
Fort Assiniboine, Choteau County .....	222
Fort Belknap water tank, Choteau County .....	223
Harlem Church, Choteau County .....	223
Havre, Choteau County .....	223
Little Rockies (Sullivan Peak), Choteau County .....	224
Mileboard 984, Choteau County .....	224
Mesa, Choteau County .....	224

## Western division of topography—Continued.

Page.

## Montana—Continued.

## Triangulation stations—Continued.

## Choteau and Valley counties, etc.—Continued.

Milk River Bridge, Choteau County .....	225
North Fork, Choteau County .....	225
Pepin, Choteau County .....	225
Pikes Peak, Choteau County .....	226
Prairie, Choteau County .....	226
Red Rock, Choteau County .....	226
Saddle, Choteau County .....	227
Sage, Choteau County .....	227
Savoy, Choteau County .....	228
Savoy water tank, Choteau County .....	228
Snake Butte, Choteau County .....	228
Square Butte, Choteau County .....	229
Squaw, Choteau County .....	229
Thibideau, Choteau County .....	229
Three Buttes, Choteau County .....	230
Walker, Choteau County .....	230
Wayne, Choteau County .....	230
West Base, Choteau County .....	231
West Cherry, Choteau County .....	231
Yantic, Choteau County .....	232
Yantic tank, Choteau County .....	232
Zurich, Choteau County .....	232
Ash, Valley County .....	233
Ashfield water tank, Valley County .....	233
Beaver, Valley County .....	233
Brazil, Valley County .....	234
Buggy, Valley County .....	234
Chester, Valley County .....	234
Glasgow, Valley County .....	235
Hicks, Valley County .....	235
Hinsdale, Valley County .....	236
Hinsdale water tank, Valley County .....	236
Larb, Valley County .....	236
Malta, Valley County .....	237
Missouri, Valley County .....	237
Moraine, Valley County .....	237
Nashua, Valley County .....	238
Nemo, Valley County .....	238
Peak, Valley County .....	238
Porcupine, Valley County .....	239
Remove, Valley County .....	239
Rock Creek, Valley County .....	240
Rock monument, Valley County .....	240
Rock monument No. 2, Valley County .....	240
Rocky, Valley County .....	241
Saco, Valley County .....	241
Saco water tank, Valley County .....	241
Short, Valley County .....	242
Square, Valley County .....	242
T. 31 N., R. 33 E., $\frac{1}{4}$ section corner, Valley County .....	242

	Page.
Western division of topography—Continued.	
Montana—Continued.	
Triangulation stations—Continued.	
Chouteau and Valley counties, etc.—Continued.	
Tampico, Valley County .....	242
Tampico water tank, Valley County .....	243
Tiger Butte, Valley County .....	243
Vandalia, Valley County .....	243
West Fork, Valley County .....	244
Willow, Valley County .....	244
Oregon .....	245
Triangulation stations .....	245
Grant, Harney, and Malheur counties .....	245
Fields, Grant County .....	245
Silvies, Grant County .....	245
Snow, Grant County .....	246
Soda, Grant County .....	246
Strawberry, Grant County .....	247
Baldy, Harney County .....	247
Burns, Harney County .....	248
Crow, Harney County .....	248
Malheur, Harney County .....	249
Trout, Harney County .....	249
Castle Rock, Malheur County .....	250
Dry Creek, Malheur County .....	250
Grass, Malheur County .....	251
Hunter, Malheur County .....	251
Ironside, Malheur County .....	252
Mitchell, Malheur County .....	252
Owyhee, Malheur County .....	253
Vale, Malheur County .....	253
Westfall, Malheur County .....	254
Idaho .....	255
Triangulation station .....	255
Washington County .....	255
Weiser, Washington County .....	255
Texas .....	255
Triangulation stations .....	255
Brewster and Presidio counties; Chisos, San Jacinto, Santiago, and Terlingua quadrangles .....	255
Big Christmas, Brewster County .....	255
Boquillas, Brewster County .....	256
Canyon flag, Brewster County .....	256
Chisos, Brewster County .....	256
Croton Peak, Brewster County .....	257
Hen Egg Mountain, Brewster County .....	257
Mail Box tank, Brewster County .....	258
Mariscal Mountain, Brewster County .....	258
Maverick Mountain, Brewster County .....	259
North Christmas, Brewster County .....	259
Rosillos Mountains, Brewster County .....	259
Santiago, Brewster County .....	260
Sawmill Mountain, Brewster County .....	260
Sierra Castella, Brewster County .....	260

Western division of topography—Continued.	Page.
Texas—Continued.	
Triangulation stations—Continued.	
Brewster and Presidio counties, etc.—Continued.	
Stuarts Peak, Brewster County .....	261
Sue Peak, Brewster County .....	261
Three Caves, Brewster County .....	262
West Corazones, Brewster County .....	262
Willow Mountain, Brewster County .....	262
Bassett Butte, Presidio County .....	263
Fresno, Presidio County .....	263
Utah .....	264
Secondary triangulation stations .....	264
Salt Lake, Summit, and Wasatch counties .....	264
Brighton, Salt Lake County .....	264
Sugarloaf, Salt Lake County .....	264
Anchor, Summit County .....	265
Bald, Summit County .....	265
Saddle, Summit County .....	266
Sawtooth, Summit County .....	266
Silver, on Summit-Salt Lake county line .....	266
Bonanza, Wasatch County .....	267
Washington .....	267
Triangulation stations .....	267
Adams, Douglas, Franklin, Kittitas, Okanogan, and Yakima counties .....	267
Crab, Adams County .....	267
Saddle, Adams County .....	268
Badger, Douglas County .....	268
Baird, Douglas County .....	269
Black Butte, Douglas County .....	270
Bluff, Douglas County .....	270
Blythe, Douglas County .....	270
Columbia, Douglas County .....	271
Coulee, Douglas County .....	272
Coulee City, Douglas County .....	272
Dewey, Douglas County .....	272
Dyer, Douglas County .....	273
Flynn, Douglas County .....	273
Frenchman, Douglas County .....	274
Green, Douglas County .....	275
Guske, Douglas County .....	275
Hill, Douglas County .....	276
Hill House, Douglas County .....	276
Jackson, Douglas County .....	276
Keane, Douglas County .....	277
Lewis, Douglas County .....	277
McDonald, Douglas County .....	278
McManamon, Douglas County .....	278
McCune, Douglas County .....	279
McMann, Douglas County .....	279
Pilot, Douglas County .....	280
Quincy, Douglas County .....	280
Ragged, Douglas County .....	280

Western division of topography—Continued.	Page.
Washington—Continued.	
Triangulation stations—Continued.	
Adams, Douglas, Franklin, etc.—Continued.	
Round, Douglas County .....	281
St. Andrews, Douglas County .....	281
Saddle (2), Douglas County .....	282
Sand, Douglas County .....	283
Sand hill, Douglas County .....	283
Schlagel, Douglas County .....	283
Sentinel, Douglas County .....	284
Severson, Douglas County .....	285
Stevenson, Douglas County .....	285
St. Andrews schoolhouse, Douglas County .....	286
Timber Peak, Douglas County .....	286
Three Springs, Douglas County .....	286
Two Springs, Douglas County .....	287
Webber's windmill, Douglas County .....	287
Wheeler, Douglas County .....	288
Winchester, Douglas County .....	288
Kuntz, Franklin County .....	288
Scooten, Franklin County .....	289
Johnson, Kittitas County .....	289
Squaw, Kittitas County .....	290
Wenatchee, Kittitas and Chelan counties .....	290
Whiskeydick, Kittitas County .....	291
Bunch Grass, Okanogan County .....	291
Chelan, Okanogan County .....	292
Cooper, near Okanogan-Chelan county line .....	292
Moses, Okanogan County .....	293
Salt Lake, Okanogan County .....	293
Atanum, Yakima County .....	294
Coal, Yakima County .....	294
Hog Ranch, Yakima County .....	295
Moxee, Yakima County .....	295
Gable, Yakima County .....	296
Wenas, Yakima County .....	296
Wyoming .....	297
Triangulation stations .....	297
Albany, Carbon, Johnson, and Natrona counties; Alcovia, Broken Horn, Casper, Fort McKinney, Fort Steele, Griggs, Laramie, and Medicine Bow quadrangles .....	297
Jelm, Albany County .....	298
Chalk Hill, Carbon County .....	298
Elk, Carbon County .....	298
Medicine Bow, Carbon County .....	299
Mount Steele, Carbon County .....	299
Needle, Carbon County .....	300
Pedro, Carbon County .....	300
Pelham, Carbon County .....	301
Rock, Carbon County .....	301
Sage, Carbon County .....	302
Shirley, Carbon County .....	302
St. Mary, Carbon County .....	303



	Page.
Western division of topography—Continued.	
Wyoming—Continued.	
Triangulation stations—Continued.	
Albany, Carbon, Johnson, and Natrona counties, etc.—Cont'd.	
Accident, Johnson County .....	303
Buffalo, Johnson County .....	303
Cross H, Johnson County .....	304
“E. K.,” Johnson County .....	304
Goodwater, Johnson County .....	305
Pyrite, Johnson County .....	305
Sussex, Johnson County .....	306
The Horn, Johnson County .....	306
Tisdale, Johnson County .....	307
Alcova, Natrona County .....	307
Basin, Natrona County .....	308
Broken Horn, Natrona County .....	308
Brooks, Natrona County .....	309
Casper, Natrona County .....	309
Casper city hose tower, Natrona County .....	309
Mesa, Natrona County .....	310
Piney, Natrona County .....	310
Rattlesnake, Natrona County .....	311
Reef, Natrona County .....	311
Sandy, Natrona County .....	311
Shepherd, Natrona County .....	312
Index .....	313

---

## ILLUSTRATION.

---

PLATE I. Map showing condition of astronomic location and primary control. . . . . 17

## LETTER OF TRANSMITTAL.

---

DEPARTMENT OF THE INTERIOR,  
UNITED STATES GEOLOGICAL SURVEY,  
*Washington, D. C., July 29, 1904.*

SIR: I have the honor to transmit herewith, in form for publication, the results of the primary triangulation and primary traverse executed by the United States Geological Survey during the fiscal year 1903-4.

The results were computed by Messrs. George T. Hawkins, C. F. Urquhart, H. L. Baldwin, jr., R. H. Chapman, Sledge Tatum, E. L. McNair, J. R. Ellis, L. Scott Smith, D. H. Baldwin, C. B. Kendall, J. F. McBeth, and Arthur Stiles.

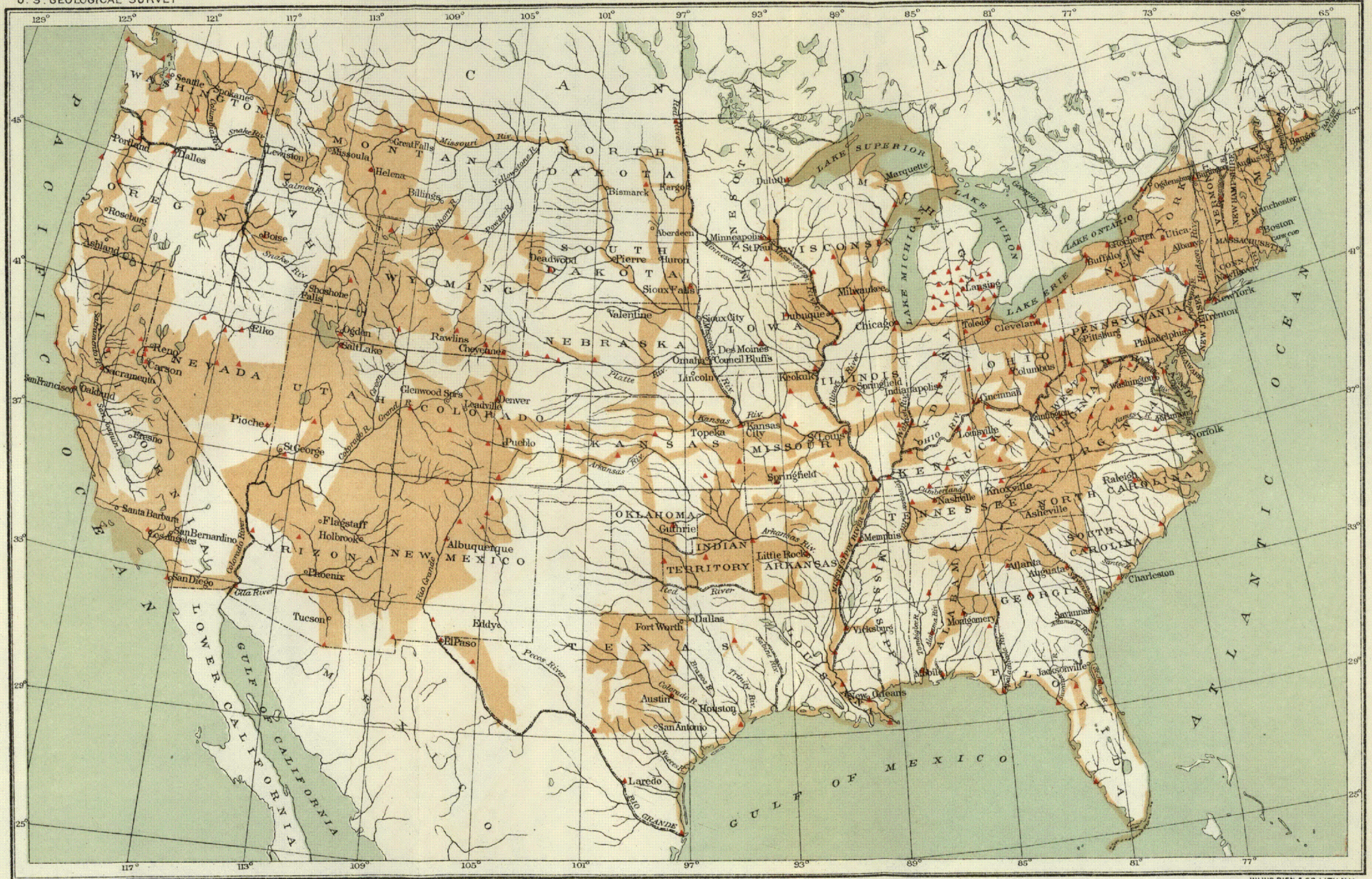
Very respectfully,

S. S. GANNETT,  
*Geographer,*  
*In charge Triangulation and Computing Section.*

HON. CHARLES D. WALCOTT,  
*Director United States Geological Survey.*







MAP SHOWING CONDITION OF ASTRONOMIC LOCATION AND PRIMARY CONTROL  
to April 30, 1904

JULIUS BIEN & CO. LITH. N. Y.

Areas tinted are controlled by triangulation or traverse  
▲ Astronomic station

100 0 100 200 300 400 500 600 MILES

100 0 300 500 LES

stc  
▲ At





THE WORLD'S HISTORY AND GEOGRAPHY

BY J. H. COOPER

NEW YORK: THE CENTRAL BOOK CONCERN, 1900



# RESULTS OF PRIMARY TRIANGULATION AND PRIMARY TRAVERSE, FISCAL YEAR 1903-4.

By **SAMUEL S. GANNETT.**

## SUMMARY.

*Summary of published results, 1903-4: Triangulation and primary traverse.*

Locality.	Triangulation stations.	Traverse stations.
<b>EASTERN DIVISION.</b>		
Alabama .....		167
Georgia .....		83
Illinois-Indiana .....		42
Illinois .....		38
Kansas .....		153
Kentucky .....		262
Louisiana .....		41
Maryland .....		139
Michigan .....		35
Illinois .....		34
Missouri .....		189
New York .....	4	213
North Dakota .....		48
North Dakota-Minnesota .....		177
Ohio .....		801
Pennsylvania .....	13	192
Vermont-New York .....	10	
Virginia .....		78
West Virginia .....	28	
Wisconsin .....		73
<b>WESTERN DIVISION.</b>		
Arizona .....	92	
California .....	10	108
Colorado .....	20	
Montana .....	82	
Oregon .....	20	
Texas .....	21	
Utah .....	8	
Washington .....	61	
Wyoming .....	30	
Total .....	399	2,873

EASTERN DIVISION OF TOPOGRAPHY.

H. M. WILSON, *Geographer in charge.*

ALABAMA.

PRIMARY TRAVERSE.

Blount, Jefferson, and St. Clair counties; Birmingham quadrangle.

The following geographic positions were obtained from primary traverse run in 1904 by Mr. Oscar Jones, topographer. The line starts at Warnock Knob triangulation station, United States Coast and Geodetic Survey, and follows highways along north edge of quadrangle to Bremen, Ala., thence south via highways along west edge of quadrangle to Adamsville; thence southeast along Kansas City, Memphis and Birmingham Railroad to Ensley; thence along public road to Birmingham; thence along the Southern Railway to Leeds and north over public highways along east edge of quadrangle via Cahaba triangulation station of United States Coast and Geodetic Survey, closing on Warnock Knob. A line was also run from Bangor south over the Louisville and Nashville Railroad to Birmingham. Positions are given on United States standard datum.

*Geographic positions along highways.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Warnock Knob triangulation station, U. S. Coast and Geodetic Survey .....	33 59 48.24	86 41 51.84
Section line north and south .....	33 58 42.5	86 42 35.3
Bangor, 4 miles east of; forks of road, bronze tablet cemented in solid rock at northwest corner of.....	33 58 51.6	86 42 52.8
Forks of road to Nectar.....	33 58 28.5	86 44 01.0
Forks of road .....	33 58 35.0	86 44 31.4
Bangor, crossroads 300 feet west of railroad station .....	33 58 28.8	86 45 23.3
Crossing of Bremen road and Louisville and Nashville Railroad, 62 feet west of right of way, iron post No. 2..	33 58 06.2	86 45 34.6
Mulberry bridge, south end of.....	33 58 11.7	86 46 30.6
Junction of Garden City road; to Garden City, 4 miles...	33 58 19.7	86 46 40.1
Section corner .....	33 58 19.1	86 46 48.1
Section corner .....	33 58 19.4	86 47 50.8
Quarter section corner.....	33 58 19.8	86 48 21.5
Forks of road .....	33 58 43.7	86 49 09.5
Forks of road .....	33 58 56.5	86 50 06.1
Forks of road, to Blount Springs, 6 miles.....	33 58 48.0	86 50 58.5
Forks of road at church .....	33 58 24.2	86 52 25.3

*Geographic positions along highways—Continued.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Section line.....	33	57	33.5	86	52	06.7
Forks of road, Arkadelphia, 6½ miles.....	33	56	46.0	86	52	12.5
Forks of road.....	33	55	18.8	86	53	16.5
Forks of road, Bremen, 9 miles.....	33	55	47.7	86	53	57.7
Forks of road.....	33	57	38.5	86	53	51.4
Forks of road.....	33	58	27.0	86	53	49.8
Store, center of road in front of.....	33	58	46.6	86	54	28.0
Forks of road.....	33	59	01.3	86	55	27.6
New Prospect, schoolhouse, forks of road at.....	33	9	22.4	86	55	57.3
Forks of road.....	34	00	01.5	86	56	07.2
Forks of road.....	34	00	15.2	86	56	45.0
Bremen, forks of road at.....	33	59	51.4	86	58	05.6
Bremen, iron post No. 4, NE. fence corner, forks of road, Arkadelphia and Garvins Point.....	33	59	25.4	86	58	19.7
Forks of road.....	33	59	08.9	86	57	24.0
Forks of road.....	33	58	29.0	86	56	50.8
Box schoolhouse, center of road opposite.....	33	57	34.3	86	57	04.1
Quarter section corner, stone.....	33	56	46.4	86	56	31.7
Forks of road, top of mountain.....	33	55	50.0	86	56	45.3
Forks of road on ¼ section line, Bremen, 6 miles.....	33	55	34.8	86	56	32.5
Crossroads on ¼ section line, to Arkadelphia, 1½ miles....	33	54	55.0	86	56	32.4
Forks of road.....	33	53	55.5	86	56	27.8
Forks of road, signboard, "Arkadelphia, 2 miles".....	33	53	16.5	86	56	18.5
Forks of road, signboard, "Jasper, 28 miles".....	33	52	29.6	86	56	15.9
Hanby Mills; bridge over Mulberry Fork of Black War- rior River, bronze tablet set in southeast corner of north abutment of.....	33	52	21.6	86	55	23.1
Sloan post-office, center of road in front of.....	33	51	37.7	86	56	15.4
Church, forks of road at.....	33	51	12.0	86	56	45.2
Section corner stone.....	33	50	53.3	86	57	18.0
Walker and Blount counties, county line, east and west on section line.....	33	50	40.7	86	57	29.6
Forks of road.....	33	49	59.6	86	58	06.0
Little Vine church, center of road, 85 feet west of.....	33	48	57.1	85	59	02.9
Forks of road.....	33	48	24.9	86	58	22.4
Forks of road.....	33	47	05.6	86	58	16.9
Forks of road.....	33	46	36.7	86	58	22.5
Church, forks of road at.....	33	45	47.0	86	58	53.8
Forks of road at house.....	33	45	25.7	86	59	22.7
Robbins crossroads, bronze tablet cemented in solid rock, 68 feet east of crossroads.....	33	44	04.9	86	59	40.9
Forks of road.....	33	43	02.2	86	59	23.5
Louisville and Nashville Railroad, forks of road at.....	33	42	13.3	86	58	50.0

*Geographic positions along highways—Continued.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Center of iron bridge over creek.....	33	41	37.0	86	58	23.7
Crossroads.....	33	41	03.3	86	58	17.3
Linns crossing, eastern stone pier, overhead bridge of Louisville and Nashville Railroad.....	33	40	37.4	86	58	00.6
Southern Railway crossing.....	33	40	30.0	86	57	58.2
Forks of road.....	33	39	36.0	86	57	59.5
Forks of road.....	33	39	00.5	86	58	10.6
Section line, south boundary section 17.....	33	38	22.1	86	58	31.6
Grayville, forks of road at.....	33	37	41.6	86	58	23.6
Forks of road.....	33	36	56.3	86	58	14.1
Adamsville station, 0.75 mile northwest of, bronze tablet cemented in solid rock at Kansas City, Memphis and Birmingham Railroad crossing, a sign crossing board bears (mag.) S. 78° ½ E.; distance, 84.4 feet.....	33	36	30.6	86	57	48.9

*Geographic positions along the Kansas City, Memphis and Birmingham Railroad between  
Adamsville and Ensley.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Adamsville, signal board.....	33	36	01.3	86	57	20.2
Overhead bridge.....	33	35	19.1	86	56	49.3
Road crossing.....	33	33	56.0	86	56	11.3
Booker City, road crossing at.....	33	33	28.6	86	55	27.9
Road crossing.....	33	32	43.3	86	55	17.5
Road crossing.....	33	32	11.7	86	53	58.2
Pratt City station, 510 feet west of, road crossing on Kan- sas City, Memphis and Birmingham Railroad.....	33	31	30.7	86	53	08.7
Ensley and Pratt City stations, between, cemented in ma- sonry pedestal of iron bridge over village creek, bronze tablet No. 8.....	33	31	14.8	86	53	21.4

*Geographic positions along highways.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Ensley, center of F and Seventeenth streets.....	33	30	50.0	86	53	41.0
Ensley, street corner and Birmingham road.....	33	30	38.9	86	52	26.8
Section line.....	33	30	46.3	86	51	57.9
Crossroads at end of electric line.....	33	30	41.8	86	50	58.0
Birmingham, Eighth avenue and Twentieth street.....	33	31	17.9	86	48	35.9
Birmingham, Eighth avenue and Twenty-sixth street ...	33	31	30.8	86	48	08.7

*Geographic positions along Southern Railway between Birmingham and Leeds.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Avondale station, street crossing just south of .....	33 31 35.3	86 46 34.0
Woodlawn station, road crossing 200 feet east of .....	33 32 14.1	86 45 09.5
Irondale Union station, street crossing 200 feet east of ....	33 32 17.9	86 42 26.7
Weems station, road crossing 1 mile west of .....	33 32 35.2	86 40 41.3
Southern Railway and Seaboard Air Line Railway, over- head crossing .....	33 33 23.3	86 39 49.2
Weems station, Central of Georgia Railway, road cross- ing 1 mile east of .....	33 33 45.2	86 39 03.8
Road crossing .....	33 33 13.7	86 37 04.2
Louck station, road crossing at .....	33 33 28.3	86 36 45.9
Cahaba River, east abutment of Southern Railway bridge over .....	33 32 58.3	86 35 21.0
Henryellen station, center of track in front of .....	33 33 17.8	86 34 20.4
Road crossing .....	33 32 50.1	86 33 43.9
Leeds, 0.6 mile west of; 615 feet west of trestle over East Cahaba River, in limestone 35 feet north of Southern Railway track, bronze tablet stamped "Prim. Trav. Sta. No. 9, elev. 627 feet" .....	33 32 53.2	86 32 56.6
Leeds station, Southern Railway, 120 feet west of; road crossing .....	33 32 37.8	86 32 23.7

*Geographic positions along highways.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Jefferson-St. Clair County line .....	33 33 19.5	86 31 50.8
Leeds, 1.5 miles east of; opposite Cedar Grove Church, in large rock, bronze tablet stamped "Elev. 644 feet" ..	33 33 28.2	86 31 39.1
Road forks, west and north to Springville, 40 feet north- east to large oak tree painted "Elev. 642 feet," 10 feet northwest to signboard .....	33 33 53.6	86 31 30.9
Road forks east and south, 35 feet north to pine tree painted "Elev. 658 ft.," 10 feet south to small oak tree ..	33 34 23.4	86 31 33.1
Road forks southeast and south to Leeds, 10 feet east to rail fence; 50 feet south to oak tree painted "Elev. 702 ft." .....	33 35 29.0	86 31 37.4
Big Black Creek, center of .....	33 35 43.9	86 31 56.2
Three corners, road to northeast .....	33 35 50.6	86 32 05.8
Road forks, north to Springville, west to Trussville .....	33 36 11.2	86 32 31.1
Road forks to west, 10 feet south to pine tree painted "Elev. 689 ft." .....	33 37 09.8	86 31 55.0
Seaboard Air Line Railway crossing .....	33 37 40.2	86 31 30.3
Crossroads, 25 feet west to front gate of yard .....	33 37 57.3	86 31 21.8
Road forks to south and southeast .....	33 38 47.2	86 30 41.5
Road forks to northeast and north .....	33 39 32.2	86 30 27.3



*Geographic positions along highways—Continued.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Road forks (second class) east and southeast, at southwest corner of cornfield.....	33 40 12.4	86 30 26.8
Road forks to south and southeast, 15 feet east to pine tree with signboard "Leeds 10 miles," 40 feet west to old forked snag.....	33 40 48.5	86 30 39.0
Church, road forks to southeast, 40 feet south to pine stump, 25 feet north to hickory tree.....	33 41 30.9	86 30 30.4
Milepost C 120, at road crossing 2,020 feet south of, bronze tablet No. 10 cemented in concrete 18 inches below surface of rail in center of track of Alabama Great Southern Railroad, signboard bears S. 76° ½ W. distant 15.5 feet.....	33 42 25.2	86 30 57.2
Birmingham and Springville road junction, road northwest, 25 feet north to bridge, 10 feet southeast to oak tree.....	33 44 09.4	86 30 08.9
Cahaba, triangulation station U. S. Coast Survey.....	33 44 47.09	86 31 32.91
Crossroad.....	33 45 10.6	86 31 59.6
Crossroad.....	33 44 48.3	86 32 48.8
Ayres, forks of road at.....	33 44 02.7	86 33 42.5
Forks of road.....	33 44 02.6	86 34 14.1
Forks of road.....	33 45 01.2	86 35 33.9
Creek crossing.....	33 44 37.1	86 36 31.1

*Geographic positions along the Birmingham Mineral Railway between Palmer and Chepultepec.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Palmer station, 0.5 mile north of; crossing of road and Birmingham Mineral Railway.....	33 44 18.4	86 38 52.5
Village Springs station, center of track opposite signal post.....	33 45 58.3	86 37 57.3
Remlap station, center of.....	33 48 55.2	86 35 59.8
Watseka flag station, road crossing at.....	33 49 46.8	86 34 57.6
Road crossing.....	33 50 28.4	86 34 17.4
Road crossing.....	33 51 02.0	86 33 44.8
Road crossing.....	33 51 36.0	86 33 09.3
Road crossing.....	33 52 56.0	86 31 21.8
Road crossing.....	33 53 30.6	86 30 47.6
Chepultepec station, in masonry culvert 3,590 feet south of, 1,420 feet south of milepost L 419, in top of course of stone and on west side of track, bronze tablet No. 11.....	33 53 58.6	86 30 18.6
Chepultepec station, road crossing 110 feet south of.....	33 54 17.5	86 29 43.0

*Geographic positions along highways between Chepultepec and Warnock Knob.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Chepultepec, crossroad crossing .....	33 54 42.9	86 30 33.6
Forks of road, Morris Mill 1 mile (signboard) .....	33 55 10.1	86 31 34.8
Top of Sand Mountain, forks of road in gap .....	33 55 34.7	86 32 22.2
Forks of road .....	33 56 10.1	86 32 37.1
Crossroad .....	33 56 44.2	86 33 00.6
Forks of road, Blountville and Bangor .....	33 57 27.9	86 33 41.2
Forks of road .....	33 57 18.4	86 34 37.6
Tidewell, 0.5 mile north of; junction Blountville and Bangor roads .....	33 57 14.6	86 35 13.3
Forks of road .....	33 57 04.7	86 36 45.0
Forks of road .....	33 57 13.4	86 37 31.9
Locust Fork of Black Warrior River, center of wooden bridge over .....	33 57 22.8	86 37 34.4
Crossroads .....	33 57 36.0	86 38 21.8
Forks of road at church .....	33 57 37.8	86 38 59.8
Forks of road .....	33 57 31.9	86 39 38.0
Forks of road .....	33 57 35.9	86 41 26.1
Forks of road .....	33 57 57.8	86 41 58.7

*Geographic positions along the Louisville and Nashville Railroad between Bangor and Birmingham.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Crossing of Bremen road and Louisville and Nashville Railroad, iron post No. 2; 62 feet west of right of way, S. 65° W. from crossing .....	33 58 06.2	86 45 34.6
Road crossing .....	33 57 19.0	86 46 11.6
Blount Springs station .....	33 55 56.8	86 47 45.2
Pumphouse, road crossing at .....	33 55 29.0	86 48 22.0
Creek crossing .....	33 54 36.5	86 49 35.8
Reeds station, road crossing at .....	33 52 45.9	86 50 39.7
Road crossing .....	33 51 59.9	86 49 57.8
Road crossing .....	33 50 58.2	86 49 37.9
Linton box station, branch road to Coaldale .....	33 50 11.7	86 48 52.5
Road crossing .....	33 49 49.7	86 48 59.4
Warrior station, center of signal .....	33 48 52.5	86 48 31.1
Seloca, road crossing at .....	33 47 30.4	86 49 05.7
Locust Fork of Black Warrior River, bronze tablet No. 3, cemented in north abutment of bridge over .....	33 47 05.5	86 49 10.2
Kimberly, road crossing at .....	33 46 23.3	86 48 44.6
Morris station .....	33 44 51.1	86 48 32.0
Brickyards, road crossing at .....	33 43 53.4	86 47 52.1

*Geographic positions along the Louisville and Nashville Railroad between Bangor and Birmingham—Continued.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Haygood crossing, signboard .....	33 42 20.1	86 47 26.1
Road crossing .....	33 41 48.8	86 47 23.8
Cunningham station, signal board of telegraph station ...	33 40 30.0	86 46 18.5
Newcastle, signal .....	33 38 49.6	86 46 12.6
Lehman flag station, signboard .....	33 37 48.4	86 47 03.6
Black Creek, telegraph station at .....	33 37 01.3	86 47 07.2
Hughes siding, flag station .....	33 36 10.3	86 47 13.4
Gardners Mills, flag station .....	33 35 17.8	86 47 31.0
Road crossing .....	33 34 28.4	86 47 19.4
Boyles station, signal .....	33 33 00.0	86 47 24.2
Crossing of Louisville and Nashville and Central of Georgia railroads .....	33 31 57.0	86 47 27.6
Birmingham, Eighth avenue and Twenty-sixth street ...	33 31 30.8	86 48 08.7

## GEORGIA.

### PRIMARY TRAVERSE.

Elbert, Lincoln, McDuffie, Oglethorpe, Taliaferro, and Wilkes counties; Wilkes quadrangle.

During April and May, 1903, a line of primary traverse was run by Mr. E. L. McNair, topographer, for the control of the Wilkes quadrangle. The line starts at the United States Coast and Geodetic Survey triangulation station, Rose Hill, about 1 mile south of Middleton, on the Seaboard Air Line Railway, and follows highways south-easterly to about latitude  $34^{\circ}$ ; thence westerly to Vesta and Salmon post-office, in Oglethorpe County; thence southerly near meridian  $83^{\circ}$  to Philomath, and thence southeasterly to Crawfordville. From Crawfordville the line follows the Georgia Railroad to Barnett and Washington, and then via highways northerly to Tignall triangulation station. Another line begins at Sharon on the Georgia Railroad and runs easterly along highways to Wrightsboro; thence northerly near meridian  $82^{\circ} 30'$  via Amity, Loco, and Lincolnton to Lisbon, at the junction of the Broad and Savannah rivers; thence westerly near parallel  $34^{\circ}$  to a point near the beginning of the first line.

A spur line about  $\frac{1}{4}$  miles long was run westward from Loco to Lincolnton triangulation station of the United States Coast and Geodetic Survey. Positions are given on the United States standard datum.

*Geographic positions along highways from Rose Hill triangulation station, United States Coast and Geodetic Survey, to Crawfordville.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Rose Hill, U. S. Coast and Geodetic Survey triangulation station .....	34	05	01.42	82	45	33.33
Forks of road .....	34	04	06.80	82	44	37.7
Crossroads .....	34	03	10.2	82	44	36.5
Flatwoods Academy, 650 feet south of road east of .....	34	01	22.6	82	43	48.1
Crossroads .....	33	59	24.6	82	43	54.0
Bell's ferry bridge, crossroads 1 mile north of .....	33	59	17.5	82	46	26.7
Forks of road .....	33	58	18.2	82	49	00.6
Forks of road .....	33	57	48.9	82	51	30.4
Crossroads .....	33	57	09.0	82	53	52.6
Crossroads .....	33	56	27.4	82	55	11.8
Vesta post-office, forks of road at .....	33	57	23.6	82	56	22.7
Vesta post-office, southwest corner of porch of store .....	33	57	23.6	82	56	23.7
Forks of road .....	33	57	00.4	82	57	52.8
Salmon post-office, forks of road 75 feet west of Tiller's store .....	33	56	40.5	82	59	39.6
Forks of road .....	33	55	24.7	82	57	49.0
Crossroads, near sawmill .....	33	54	04.6	82	57	25.6
Forks of road .....	33	53	17.7	82	57	38.8
Forks of road .....	33	50	51.3	82	58	15.6
Forks of road opposite white church .....	33	50	13.2	82	58	40.8
Forks of road .....	33	49	15.4	83	00	27.7
Forks of road, junction with Nashville and Lexington road ..	33	48	24.7	83	00	41.6
Crossroads, 1,900 feet south of Tuggle schoolhouse .....	33	46	03.1	83	02	10.2
Forks of road .....	33	45	07.7	83	01	58.4
Philomath post-office .....	33	43	32.2	82	59	13.6
Forks of road .....	33	42	54.3	82	58	02.3
Opposite church on right .....	33	41	09.2	82	56	07.1
Forks of road, to Washington .....	33	39	46.5	82	54	56.8
Lyneville, three corners at .....	33	38	09.3	82	55	51.1
Creek crossing .....	33	37	15.6	82	55	08.5
Forks of road .....	33	35	47.8	82	55	24.6
Crawfordville, tower of court-house .....	33	33	20.7	82	53	55.4

*Geographic positions along the Georgia Railroad from Crawfordville to Barnett.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Crawfordville, street crossing .....	33	33	25.2	82	54	01.5
Crawfordville station, semaphore post .....	33	33	15.2	82	53	35.0
Road crossing .....	33	32	59.5	82	52	34.3
Opposite milepost 61 .....	33	31	30.9	82	50	58.7
Road crossing .....	33	31	05.5	82	49	46.1
Barnett station, center of track opposite west end of .....	33	30	33.2	82	48	39.4

*Geographic positions along a branch of the Georgia Railroad from Barnett to Washington.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Milepost 2 .....	33	32	01.2	82	48	04.8
Sharon station, opposite semaphore post .....	33	33	33.1	82	47	46.3
Hillman station, road crossing at .....	33	36	03.3	82	47	53.8
Road crossing .....	33	37	14.5	82	47	10.9
Road crossing .....	33	38	56.0	82	46	22.1
Road crossing .....	33	39	46.5	82	46	02.3
Road crossing at water tank .....	33	41	44.7	82	45	23.6
Road crossing .....	33	43	11.2	82	45	31.5

*Geographic positions along highways from Washington to Tignall.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Washington, southwest corner of public square .....	33	44	12.8	82	44	22.9
Creek crossing .....	33	46	18.2	82	44	48.1
Forks of road at church .....	33	47	34.2	82	45	29.6
Armstrong post-office and store .....	33	48	36.0	82	45	46.2
Forks of road .....	33	51	15.8	82	44	33.4
Tignall Baptist Church, U. S. Coast and Geodetic Survey station .....	33	52	01.5	82	44	19.0



*Geographic positions along highways from Sharon to Wrightsboro.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Nye post-office, crossroads .....	33	34	09.4	82	45	10.2
Opposite signpost at forks of road .....	33	34	30.8	82	42	17.4
Crossroads .....	33	34	00.0	82	40	30.4
Forks of road .....	33	33	40.5	82	38	57.3
Crossroads .....	33	34	10.7	82	37	01.7
Wrightsboro, monument of Dr. E. C. Hawes in church-yard .....	33	33	01.6	82	34	21.3

*Geographic positions along highways from Wrightsboro to Lincolnton.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Wrightsboro, three corners .....	33	33	01.3	82	34	08.2
Wrightsboro, southwest corner of wall under Oscar Williams's store .....	33	33	01.1	82	34	06.7
Anthony post-office, crossroads .....	33	35	15.3	82	32	33.4
Creek crossing .....	33	36	49.3	82	31	29.8
Tatham post-office, $\frac{3}{4}$ mile north of, forks of road .....	33	38	24.2	82	31	44.8
Creek crossing .....	33	37	27.6	82	29	49.8
Three corners .....	33	36	58.9	82	29	19.3
Raysville, south end of approach to iron bridge over Little River .....	33	38	36.4	82	28	36.8
Amity post-office, four corners at .....	33	40	32.7	82	29	24.1
Crossroads .....	33	42	59.9	82	28	49.0
Forks of road .....	33	46	02.3	82	28	05.9
Lincolnton, crossroads .....	33	47	20.1	82	28	34.9
Lincolnton, southeast corner of court-house .....	33	47	33.4	82	28	45.6

*Geographic positions along highways from Lincolnton to Lisbon.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Hollinshead store, forks of road at .....	33	48	11.5	82	28	20.8
Forks of road .....	33	50	06.4	82	28	33.9
Crossroads .....	33	50	41.7	82	29	10.9
Goshen post-office crossroads, 500 feet north of .....	33	51	49.0	82	30	28.7
Forks of roads .....	33	53	11.8	82	31	26.9
Crossroads, 75 feet north of Fishing Creek .....	33	54	54.9	82	33	13.9
Forks of road .....	33	55	45.7	82	33	54.2
Lisbon, northwest corner of Dr. B. J. Dubose's store .....	33	57	23.3	82	34	22.70
Lisbon, southwest corner of R. L. Cade's brick store .....	33	57	24.3	82	34	22.3

*Geographic positions along highways from Lisbon westward via Huguenot to point on line near Rose Hill triangulation station.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Crossroads, road right to Elberton.....	33 59 15.2	82 36 02.5
Huguenot, opposite post-office and store .....	33 59 21.8	82 37 18.9
Forks of road .....	33 59 52.9	82 38 53.8
Creek crossing .....	33 59 49.5	82 41 22.6

## ILLINOIS-INDIANA.

### PRIMARY TRAVERSE.

Gallatin and White counties (Ill.), Posey County (Ind.); Newhaven quadrangle.

The following geographic positions were located by primary traverse in 1903 by Mr. J. R. Ellis. The line starts from an adjusted traverse position at Mannie and follows highways, south to border of quadrangle; thence west to northwest corner of quadrangle; thence south along west border of quadrangle to Ridgeway; thence east to Uniontown, Ky., connecting at the latter place with spur line from Henderson, Ky.

*Geographic positions along highways.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Mannie, road crossing at.....	38 02 10.5	88 02 45.9
T. 6 S., Rs. 10 and 11 E., corner secs. 1, 6, 7, and 12.....	38 01 29.2	88 02 29.8
T. 6 S., Rs. 10 and 11 E., quarter corner between secs. 13 and 18 .....	38 00 02.6	88 02 30.3
T. 6 S., R. 10 E., quarter corner between secs. 23 and 26.	37 58 52.3	88 04 10.3
T. 6 S., R. 10 E., corner secs. 22, 23, 26, and 27 .....	37 58 52.9	88 04 42.7
T. 6 S., R. 10 E., corner secs. 21, 22, 27, and 28 .....	37 58 53.4	88 05 49.7
Emma, crossroads at church in north part of.....	37 58 53.7	88 07 11.7
Emma, T road south at .....	37 58 40.7	88 07 08.5
Emma, crossroads 0.75 mile south of.....	37 58 01.4	88 07 13.3
T. 6 S., R. 10 E., corner secs. 29, 30, 31, and 32.....	37 58 02.0	88 08 03.0
T. 6 S., Rs. 9 and 10 E., corner secs. 25, 30, 31, and 36...	37 58 02.7	88 09 08.6
T. 6 S., R. 9 E., corner secs. 25, 26, 35, and 36 .....	37 58 02.8	88 10 14.8
T. 6 S., R. 9 E., corner secs. 26, 27, 34, and 35 .....	37 58 03.2	88 11 21.5
T. road north .....	37 58 03.8	88 14 08.2
Range line road at T road east .....	37 57 51.0	88 15 09.8
Road at T road east .....	37 57 51.0	88 15 48.3
Tps. 6 and 7 S., Rs. 8 and 9 E., corner secs. 31, 36, 1, and 6.	37 57 11.2	88 15 48.2
T. 7 S., Rs. 8 and 9 E., corner secs. 7, 12, 13, and 18.....	37 55 27.1	88 15 43.9
T. 7 S., Rs. 8 and 9 E., corner secs. 13, 18, 19, and 24.....	37 54 36.0	88 15 43.9

*Geographic positions along highways—Continued.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
T. 7 S., Rs. 8 and 9 E., corner secs. 19, 24, 25, and 30.....	37	53	43.6	88	15	43.1
T. 7 S., Rs. 8 and 9 E., corner secs. 25, 30, 31, and 36....	37	52	50.1	88	15	44.3
T road west.....	37	52	23.6	88	15	53.2
T road west.....	37	51	30.0	88	15	02.5
T road east.....	37	50	38.4	88	14	45.7
T road east.....	37	49	47.8	88	14	48.0
T road east.....	37	48	54.8	88	14	46.6
Ridgeway, crossroads 0.5 mile east of.....	37	48	02.2	88	14	46.9
T. 8 S., R. 9 E., corner secs. 29, 30, 31, and 32.....	37	47	35.8	88	14	47.1
T. 8 S., R. 9 E., corner secs. 28, 29, 32, and 33.....	37	47	34.5	88	13	40.5
T. 8 S., R. 9 E., corner secs. 27, 28, 33, and 34.....	37	47	32.9	88	12	33.5
T. 8 S., R. 9 E., corner secs. 26, 27, 34, and 35.....	37	47	33.4	88	11	29.9
T. 8 S., R. 9 E., corner secs. 25, 26, 35, and 36.....	37	47	33.7	88	10	24.2
T road south.....	37	47	33.6	88	09	16.4
T. 8 S., R. 10 E., quarter corner between secs. 30 and 31.	37	47	33.0	88	08	45.3
Intersection of northwest and southeast road and road east to Sandy Ford.....	37	47	24.1	88	08	07.7
Intersection of roads at mouth of lane just east of sawmill.	37	47	03.2	88	06	14.8
Schoolhouse, T road east about 2,000 feet south of.....	37	48	07.5	88	05	49.4
Schoolhouse, T road south at house about 3,000 feet north of.....	37	48	47.4	88	05	19.2
POSEY COUNTY, IND.						
Old ferry landing, top of left bank of Wabash River, about 0.33 mile above junction with Ohio River.....	37	48	25.6	88	01	45.2
Neiderst post-office, T road east about 0.75 mile west of..	37	48	19.3	88	01	13.7
T. 8 S., R. 14 W., corner secs. 20, 21, 28, and 29.....	37	48	18.9	88	00	05.9
T road north, just west of Murphy's farm.....	37	47	40.3	87	59	00.6

## ILLINOIS.

## PRIMARY TRAVERSE.

Gallatin, Hamilton, Saline, and White counties; Eldorado quadrangle.

The line starts from adjusted traverse position at Ridgeway and follows Baltimore and Ohio Southwestern Railroad south to point about 1 mile northwest of Cypress Junction, thence along Louisville and Nashville Railroad through Equality, Eldorado, and Broughton to point 0.5 mile south of Dale, thence along north border of quadrangle by public highways, connecting with adjusted traverse position about 5 miles east of Norris City.

*Geographic positions along the Baltimore and Ohio Southwestern Railroad.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Ridgeway, street crossing Baltimore and Ohio Southwestern Railroad at station.....	37 47 59.0	88 15 36.9
Road crossing east and west.....	37 46 19.5	88 15 17.7
Bartley, east and west road crossing.....	37 45 17.3	88 15 09.5

*Geographic positions along highways.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
T road north.....	37 43 58.8	88 14 59.0
T. 9 S., R. 9 E., corner secs. 17, 18, 19, and 20.....	37 43 58.9	88 14 48.2

*Geographic positions along the Louisville and Nashville Railroad.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Road crossing north and south.....	37 43 46.1	88 17 03.8
Road crossing north and south.....	37 43 49.9	88 18 10.5
Equality, road crossing north and south just west of water tank.....	37 44 00.6	88 20 23.2
Equality, road crossing north and south 180 feet west of station.....	37 43 58.4	88 20 57.8
T. 9 S., R. 7 E., quarter corner between secs. 12 and 13.....	37 44 53.3	88 22 53.8
Road crossing east and west.....	37 46 11.6	88 24 04.4
Road crossing north and south.....	37 47 25.5	88 25 06.2
Road crossing north and south.....	37 47 59.0	88 25 42.5
Eldorado, crossing Louisville and Nashville and Big Four railroads.....	37 48 53.8	88 26 04.1
Road crossing east and west.....	37 50 09.3	88 26 24.3
T. 8 S., R. 7 E., quarter corner between secs. 9 and 16.....	37 50 09.2	88 26 14.3
Road crossing east and west.....	37 51 14.9	88 26 33.1
Road crossing east and west.....	37 52 19.7	88 26 41.8
Francis Mills, road crossing.....	37 53 38.5	88 26 52.2
Road crossing east and west.....	37 54 30.9	88 26 59.2
T. 8 S., R. 7 E., corner secs. 16, 17, 20, and 21.....	37 54 30.9	88 27 06.5
Road crossing east and west.....	37 55 12.0	88 27 06.4
Broughton, road crossing 500 feet north of station.....	37 56 15.9	88 27 35.5
Road crossing east and west near spur head block.....	37 57 41.9	88 28 23.3
Road crossing east and west.....	37 58 27.4	88 28 48.6
Dale, road crossing 0.5 mile south of.....	37 59 06.7	88 29 10.5

*Geographic positions along highways.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
T road north.....	37	59	06.4	88	28	03.7
T road south at quarter corner.....	37	58	53.7	88	27	21.7
Road south.....	37	58	54.0	88	25	30.6
T. 6 S., R. 7 E., corner secs. 22, 23, 26, and 27.....	37	58	54.4	88	24	36.1
T. 6 S., R. 7 E., corner secs. 23, 24, 25, and 26.....	37	58	54.7	88	23	30.0
T. 6 S., Rs. 7 and 8 E., corner secs. 19, 24, 25, and 30.....	37	58	56.5	88	22	24.2
T. 6 S., R. 8 E., corner secs. 19, 20, 29, and 30.....	37	58	56.2	88	21	18.1
T. 6 S., R. 8 E., corner secs. 20, 21, 28, and 29.....	37	58	56.1	88	20	12.3
T. 6 S., R. 8 E., corner secs. 21, 22, 27, and 28.....	37	58	56.0	88	19	06.1
T. 6 S., R. 8 E., corner secs. 22, 23, 26, and 27.....	37	58	56.2	88	18	00.0
T. 6 S., R. 8 E., corner secs. 23, 24, 25, and 26.....	37	58	56.5	88	16	54.2
T. 6 S., Rs. 8 and 9 E., corner secs. 19, 24, 25, and 30.....	37	58	56.3	88	15	48.5

## KANSAS.

## PRIMARY TRAVERSE.

Montgomery, Neosho, and Wilson Counties; Independence quadrangle.

The following geographic positions were determined from primary traverse in 1903 by Mr. George T. Hawkins. The line starts from the United States Geological Survey triangulation station Caney, in Indian Territory, and follows highways to Caney, Kans.; thence east along Missouri Pacific Railway to Coffeyville; thence north along Atchison, Topeka and Santa Fe Railway to Thayer, where connection was made with traverse position established in 1902; thence along highways to Neodesha, thence along St. Louis and San Francisco Railway to Fredonia; thence along Missouri Pacific Railway to Elk City; thence along Atchison, Topeka and Santa Fe Railway to Havana via Independence; thence along highways to Caney triangulation station.

*Geographic positions along highways.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Caney, triangulation station.....	36	58	43.64	95	59	29.83
Caney, Caney bridge, west of.....	37	00	33.5	95	57	27.7
Caney, "Santa Fe" station, road crossing at.....	37	00	35.7	95	56	29.0

*Geographic positions along the Missouri Pacific Railway between Caney and Coffeyville.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Caney, Missouri Pacific and Atchison, Topeka and Santa Fe railways, crossing of .....	37 01 15.6	95 56 28.6
Caney, Missouri Pacific station, road crossing east of ....	37 01 14.4	95 56 12.0
Caney, 0.5 mile east of road crossing north and south....	37 01 16.3	95 55 39.9
Road crossing north and south.....	37 01 22.5	95 54 34.6
Road crossing east and west.....	37 01 26.7	95 54 18.7
Creek, north and south road crossing west of.....	37 01 36.6	95 53 29.4
Oil well, 100 yards west of, road crossing.....	37 02 14.3	95 52 24.6
Milepost 44, north and south road crossing 50 feet west of.	37 02 20.1	95 51 19.1
Milepost 43, north and south road crossing 200 feet west of .....	37 02 25.1	95 50 14.4
Tps. 34, 35, S., Rs. 14, 15 E., corner of.....	37 02 15.7	95 49 09.1
Tps. 34, 35, S., R. 15 E., corner secs. 31, 32, 5 and 6.....	37 02 14.9	95 48 01.7
Tps. 34, 35, S., R. 15 E., corner secs. 4, 5, 32, 33.....	37 02 14.7	95 46 56.3
Milepost 39, north and south road crossing 50 feet east of.	37 02 16.9	95 45 51.6
Milepost 38, north and south road crossing 350 feet east of.	37 02 39.1	95 44 46.5
Road crossing.....	37 03 06.9	95 43 29.9
Deering, road crossing 100 feet east of.....	37 03 17.1	95 42 35.1
Deering, road crossing 0.5 mile southeast of.....	37 03 06.2	95 42 13.4
T road north.....	37 02 13.1	95 40 25.4
T road south.....	37 02 12.1	95 40 12.3
Milepost 32, north and south road crossing 800 feet west of .....	37 02 01.8	95 39 20.6
Milepost 31, north and south road crossing 800 feet west of .....	37 01 52.1	95 38 15.3
Coffeyville, Missouri Pacific Railway station, road crossing 400 feet west of.....	37 01 50.9	95 37 18.0
Coffeyville, Missouri Pacific and "Santa Fe" railways, crossing of.....	37 01 50.8	95 36 53.4

*Geographic positions along the Atchison, Topeka and Santa Fe Railway between Coffeyville and Thayer.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Coffeyville; Atchison, Topeka and Santa Fe Railway station, road crossing south of .....	37 02 11.6	95 36 47.3
Road crossing east and west and telephone line.....	37 02 36.6	95 36 40.0
Coffeyville; Atchison, Topeka and Santa Fe and Missouri, Kansas and Texas railways, crossing of .....	37 02 43.3	95 37 38.0
Mileposts 170 and 171, east and west road crossing between .....	37 03 56.0	95 36 16.7
T. 34 S., Rs. 16, 17 E., corner secs. 18, 19, 24, 13.....	37 04 48.2	95 36 06.2

*Geographic positions along the Atchison, Topeka and Santa Fe Railway between Coffeyville and Thayer—Continued.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
T. 34 S., Rs. 16, 17 E., corner secs. 7, 18, 13, 12 .....	37 05 40.7	95 36 05.4
Mileposts 167 and 168, east and west road crossing between .....	37 06 32.5	95 35 57.8
Mileposts 166 and 167, east and west road crossing between .....	37 07 24.4	95 35 53.9
Mileposts 165 and 166, east and west road crossing between .....	37 08 16.2	95 35 50.0
Liberty, road crossing at .....	37 09 20.6	95 35 37.8
Mileposts 163 and 164, east and west road crossing between .....	37 09 59.5	95 35 16.8
Mileposts 162 and 163, east and west road crossing between .....	37 10 50.4	95 34 49.2
T. 33 S., R. 17 E., corner secs. 5, 6, 7, and 8 .....	37 11 40.6	95 34 33.1
Tp. line, east and west road crossing on .....	37 12 31.7	95 33 54.1
Road crossing east and west and telegraph line .....	37 13 25.1	95 33 32.7
Mileposts 158 and 159, east and west road crossing between .....	37 14 19.1	95 33 26.9
Mileposts 157 and 158, east and west road crossing between .....	37 14 45.4	95 33 24.1
T. 32 S., R. 17 E., corner secs. 16, 17, 20, 21 .....	37 15 11.6	95 33 18.5
Cherryvale station, road crossing north of .....	37 16 09.3	95 33 03.5
Cherryvale, Atchison, Topeka, and Santa Fe and St. Louis and San Francisco railways, crossing of .....	37 16 25.1	95 32 59.4
Cherryvale, 0.5 mile north of, east and west road crossing .....	37 16 55.3	95 32 51.4
Creek, east and west road crossing north of .....	37 18 38.7	95 32 19.6
T. 31 S., R. 17 E., quarter corner between secs. 15 and 22 .....	37 20 25.2	95 31 43.5
T. 31 S., R. 17 E., corner secs. 15, 16, 21, 22 .....	37 21 18.4	95 31 10.9
Milepost 150, north and south road crossing 0.25 mile north of .....	37 21 27.5	95 31 11.7
Milepost 149, east and west road crossing, 600 feet north of .....	37 22 11.8	95 30 53.8
Morehead station, road crossing 100 feet south of .....	37 23 05.2	95 30 32.3
Milepost 147, east and west road crossing 0.25 mile north of .....	37 23 56.6	95 30 11.6
Red mail box, east and west road crossing at .....	37 24 48.6	95 29 49.6
Mileposts 144 and 145, north and south road crossing between .....	37 25 51.7	95 29 21.3
Mileposts 142 and 143, east and west road crossing between .....	37 27 26.7	95 28 51.3
Tp. line, road crossing on .....	37 28 19.1	95 28 28.1
Thayer station, road crossing 200 feet south of .....	37 29 19.2	95 28 12.0
Thayer station .....	37 29 21.3	95 28 12.1

*Geographic positions along highways.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Tps. 29 and 30 S., Rs. 17 and 18 E., corner of .....	37 28 19.0	95 29 19.5
T. 30 S., R. 17 E., corner secs. 2, 3, 10, 11.....	37 27 27.4	95 31 31.2
T. 30 S., R. 17 E., corner secs. 3, 4, 9, 10.....	37 27 26.8	95 32 36.6
T. 30 S., R. 17 E., corner secs. 4, 5, 8, 9.....	37 27 26.8	95 33 42.1
Reserve stone.....	37 27 27.0	95 34 13.1
T. 30 S., R. 17 E., corner secs. 5, 6, 7, 8.....	37 27 26.2	95 34 46.3
Schoolhouse, north and south road crossing at.....	37 27 26.2	95 35 19.3
T. 30 S., Rs. 16, 17 E., corner secs. 1, 6, 7, 12 .....	37 27 26.4	95 35 49.5
T road north.....	37 27 26.7	95 36 22.3
T. 30 S., R. 16 E., corner secs. 1, 2, 11, 12.....	37 27 27.0	95 36 55.1
T. 30 S., R. 16 E., corner secs. 2, 3, 10, 11.....	37 27 27.6	95 38 00.6
T. 30 S., R. 16 E., corner secs. 10, 11, 14, 15.....	37 26 35.3	95 38 00.5
T. 30 S., R. 16 E., corner secs. 9, 10, 15, 16.....	37 26 35.9	95 39 06.0
T. 30 S., R. 16 E., corner secs. 15, 16, 21, 22.....	37 25 43.4	95 39 05.8
T road east.....	37 25 04.4	95 39 14.7
T road north.....	37 24 43.6	95 39 15.0

*Geographic positions along the St. Louis and San Francisco Railroad between Neodesha and Fredonia.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Neodesha, Main street crossing.....	37 25 05.4	95 41 15.2
Neodosha, Missouri Pacific Railway crossing .....	37 25 07.2	95 41 16.9
Milepost 403, east and west road crossing 700 feet south-east of.....	37 25 57.1	95 42 03.5
Junction of roads, north and south road crossing 150 feet south of .....	37 26 19.8	95 42 24.6
Milepost 404, east and west road crossing 1,000 feet south-east of.....	37 26 37.1	95 42 40.7
Milepost 405, east and west road crossing 250 feet north of.....	37 27 29.7	95 43 29.7
Dunn's store, road crossing at.....	37 28 00.4	95 44 01.0
Mileposts 408 and 409, road crossing halfway between ...	37 28 23.6	95 46 43.9
Milepost 409, road crossing 0.25 mile northwest of.....	37 28 44.8	95 47 29.8
Road crossing.....	37 29 05.2	95 48 34.7
Road crossing east and west (stone wall on west).....	37 30 17.1	95 49 15.1
Road crossing north and south.....	37 30 39.5	95 49 27.2
Road crossing east and west.....	37 30 56.8	95 49 36.5



*Geographic positions along the Missouri Pacific Railway between Fredonia and Elk City.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Milepost 13, east and west road crossing .....	37	30	57.9	95	50	39.3
Milepost 14, east and west road crossing .....	37	30	05.4	95	50	48.7
Milepost 15, east and west road crossing 200 feet south of.	37	29	12.6	95	50	47.9
Tps. 29 and 30 S., R. 14 E., quarter corner between secs. 2 and 35, east and west road crossing .....	37	28	19.5	95	50	34.6
Tps. 29 and 30 S., R. 14 E., quarter corner between secs. 2 and 11, east and west road crossing .....	37	26	34.6	95	50	34.5
Tps. 29 and 30 S., R. 14 E., quarter corner between secs. 11 and 14, east and west road crossing at.....	37	25	47.3	95	50	35.1
Milepost 21, east and west road crossing 600 feet south of.	37	24	02.9	95	50	46.9
Lafontaine, 100 feet north of road crossing .....	37	23	54.9	95	50	50.9
Lafontaine, station, road crossing south of .....	37	23	49.6	95	50	53.5
T. 30 S., R. 14 E., corner between secs. 34 and 35 .....	37	23	10.5	95	51	07.4
Mileposts 22 and 23, north and south road crossing be- tween .....	37	22	56.2	95	51	20.2
Milepost 23, east and west road crossing one-third mile south of .....	37	22	17.8	95	51	39.4
T. 31 S., R. 14 E., quarter corner between secs. 10 and 15.	37	21	25.7	95	51	52.8
T. 31 S., R. 14 E., quarter corner between secs. 15 and 22.	37	20	33.6	95	51	52.8
Costello, 2 miles southwest of, corner of road.....	37	19	41.1	95	52	04.8
House, north and south road crossing at .....	37	18	55.6	95	52	25.4
T. 31 S., R. 14 E., corner secs. 27, 28, 33, 34 .....	37	18	48.8	95	52	25.9
T. 31 S., R. 14 E., center of sec. 33 .....	37	18	23.1	95	52	57.9
Road crossing east and west.....	37	17	56.7	95	53	22.4
Road crossing north and south.....	37	17	48.1	95	53	30.4
Atchison, Topeka and Santa Fe Railway, crossing of ....	37	17	44.7	95	53	33.6

*Geographic positions along the Atchison, Topeka and Santa Fe Railway between Elk City and Havana.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Road crossing north and south and telephone line.....	37	17	52.8	95	52	25.9
Tps. 31 and 32 S., R. 14 E., corner secs. 2, 3, 34, 35.....	37	17	56.1	95	51	19.7
Mileposts 175 and 174, north and south road crossing be- tween .....	37	17	42.4	95	50	14.3
Milepost 172, north and south road crossing 0.25 mile west of .....	37	16	55.9	95	48	09.2
Crane, road crossing at.....	37	16	46.8	95	47	48.4
Schoolhouse, east and west road crossing 600 feet west of.	37	16	10.3	95	47	23.0
Road crossing east and west.....	37	15	04.6	95	46	31.1
Road crossing north and south (U. S. 889 feet) .....	37	14	47.3	95	45	54.2

*Geographic positions along the Atchison, Topeka and Santa Fe Railway between Elk City and Havana—Continued.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Road crossing east and west.....	37	14	24.7	95	44	36.5
T. 32 S., R. 15 E., quarter corner between secs. 23 and 26.	37	14	24.8	95	44	32.3
Milepost 167, north and south road crossing 200 feet west of.....	37	14	13.4	95	43	59.9
Milepost 167, east and west road crossing 600 feet east of.	37	14	11.2	95	43	53.1
Independence, Missouri Pacific and Atchison, Topeka and Santa Fe railways, crossing of.....	37	14	03.8	95	43	30.4
Road crossing east and west.....	37	13	32.3	95	43	59.7
Tps. 32 and 33 S., R. 15 E., corner secs. 2, 3, 34, 35.....	37	13	19.1	95	44	12.0
Road crossing east, west, and south.....	37	12	40.7	95	44	48.2
T. 33 S., R. 15 E., quarter corner between secs. 3 and 10..	37	12	01.5	95	45	26.6
Milepost 170, east and west road crossing 400 feet north of.	37	11	35.1	95	45	50.0
Road crossing east and west.....	37	11	22.0	95	46	02.3
T. 33 S., R. 15 E., corner secs. 9, 10, 15, 16.....	37	10	56.2	95	46	26.6
Cluster of oil wells, north and south road crossing near..	37	10	21.9	95	46	59.7
Road crossing east and west.....	37	09	50.7	95	47	42.1
Road crossing north and south.....	37	09	34.9	95	48	04.6
Bolton, road crossing at.....	37	09	23.9	95	48	20.7
Bolton, east and west road crossing one-third mile south of.	37	09	11.6	95	48	37.6
Road crossing north and south.....	37	08	49.8	95	49	08.8
Milepost 176, east and west road crossing 1,000 feet south of.....	37	08	19.8	95	49	51.5
Road crossing north and south (U. S. 874 feet).....	37	07	38.8	95	51	19.3
Road crossing east and west.....	37	07	28.6	95	51	52.8
Wayside, crossing at.....	37	07	18.9	95	52	24.8
Road crossing north and south (U. S. 849 feet).....	37	06	59.3	95	53	30.2
Milepost 180, east and west road crossing 0.25 mile north-east of.....	37	06	40.1	95	54	14.2
Milepost 180, north and south road crossing 600 feet south-west of.....	37	06	32.9	95	54	33.6
Road crossing north and south.....	37	05	57.7	95	55	47.3
Road crossing east and west.....	37	05	48.4	95	55	58.1

*Geographic positions along highways.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Havana, Vulcan Hotel, at street corner .....	37 05 27.9	95 56 44.1
T. 34 S., R. 13 E., corner secs. 13, 14, 23, 24 .....	37 04 56.1	95 56 44.1
T. 34 S., R. 13 E., corner secs. 24, 25, 26, 23 .....	37 04 03.8	95 56 44.4
T. 34 S., R. 13 E., corner secs. 25, 26, 35, 36 .....	37 03 11.7	95 56 44.7
Tps. 34 and 35 S., R. 13 E., corner secs. 1, 2, 35, 36 .....	37 02 19.4	95 56 44.4
Cherokee Strip, east and west line of, stone on .....	37 02 03.1	95 56 44.4
Caney, road crossing north west of .....	37 01 17.3	95 56 44.5
Elk City, road crossing at .....	37 17 47.5	95 54 39.1
T. 31 S., Rs. 13 and 14 E., quarter corner west side sec. 31 ..	37 18 24.0	95 55 40.3

## KENTUCKY.

## PRIMARY TRAVERSE.

Anderson, Fayette, Franklin, Grant, Henry, Owen, Scott, and Woodford counties; Frankfort quadrangle.

The following geographic positions were determined from primary traverse by Mr. J. R. Ellis, topographic aid, in 1904. The line starts from United States Coast and Geodetic Survey triangulation station, court-house dome, at Williamstown and follows the Cincinnati, New Orleans and Texas Pacific Railway to Lexington; thence west along Southern Railway to Lawrenceburg; thence north and east along highways near borders of quadrangle, and is tied to starting point at Williamstown. A line was also run over the Frankfort and Cincinnati Railway from Hatton via Frankfort to Georgetown.

*Geographic positions along the Cincinnati, New Orleans and Texas Pacific Railway between Williamstown and Lexington.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Williamstown, court-house dome, U. S. Coast and Geodetic Survey triangulation station .....	38 38 12.5	84 33 39.4
Williamstown, road crossing just south of .....	38 37 52.7	84 34 02.5
Williamston, east and west overhead road crossing at south end long siding .....	38 37 04.2	84 34 15.0
Steel bridge, overhead east and west road crossing .....	38 36 14.7	84 34 25.7
Steel bridge No. 10, overhead east and west road crossing ..	38 35 53.1	84 34 28.4
Road crossing east and west just east of T road east .....	38 34 48.6	84 34 50.6
Mason station .....	38 34 24.4	84 35 09.3
Mason, east and west road crossing at south end siding ..	38 33 54.9	84 35 17.3
Pike crossing north and south .....	38 32 56.9	84 35 25.4

*Geographic positions along the Cincinnati, New Orleans and Texas Pacific Railway between Williamstown and Lexington—Continued.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Overhead crossing northeast and southwest .....	38 32 20.2	84 34 47.1
Blanchet, overhead crossing near north end of siding ...	38 31 27.0	84 34 30.2
Blanchet station .....	38 31 10.3	84 34 18.4
Corinth, overhead road crossing 1 mile north of .....	38 30 20.2	84 33 46.7
Corinth, bench-mark post stamped "Prim. Trav. Sta. No. 14" in south corner of R. T. Shaw's front yard; southeast corner Shaw's house bears S. 19° 45' W., distant 80.7 feet; telephone pole bears S. 16° 30' E., distant 37.5 feet; south corner yard fence bears S. 16° 30' E., distant 4 feet.....	38 29 39.9	84 33 42.5
Road crossing northeast and southwest .....	38 29 34.3	84 33 29.5
Milepost 288 .....	38 28 47.4	84 33 06.3
Milepost 287, road crossing east and west.....	38 27 59.5	84 32 47.7
Overhead road crossing northeast and southwest .....	38 27 38.5	84 32 10.2
Hinton, road crossing at .....	38 27 23.4	84 31 49.9
Overhead road crossing (iron bridge).....	38 26 54.6	84 31 35.4
Harrison-Scott county line, overhead east and west road crossing at .....	38 25 59.1	84 31 42.0
Bridge No. 13, center of .....	38 24 02.4	84 32 08.5
Sadleville, bench-mark post stamped "Prim. Trav. Sta. No. 15," in northwest corner of G. B. Johnson's yard; northwest corner of Johnson's house bears S. 66° E., distant 32.9 feet; northeast corner station platform bears S. 86° 30' W., distant 62 feet; southwest corner of Elizabeth Theobald's house bears N. 74° 15' E., distant 21.2 feet.....	38 23 28.1	84 32 11.4
Sadleville, road crossing under trestle.....	38 23 22.3	84 32 15.5
Road crossing east and west under railway.....	38 22 00.9	84 32 14.2
Road crossing east and west under railway.....	38 20 40.5	84 31 45.9
Milepost 277, road crossing east and west under railway..	38 20 03.0	84 31 36.7
Road crossing east and west (private) .....	38 19 27.2	84 31 39.4
Rogers Gap, bench mark stamped "Prim. Trav. Sta. No. 16," set in T. B. Milner's stable lot, 3.8 feet north of northeast corner of stable; north corner of railway station bears S. 28° 15' E., distant 99.2 feet; tile culvert bears S. 59° 45' E., distant 70.2 feet.....	38 18 14.4	84 32 15.5
Rogers Gap, road crossing at.....	38 18 12.7	84 32 14.8
Milepost 274, private road crossing 870 feet south of .....	38 17 23.5	84 32 25.3
Kinkaid, east and west road crossing .....	38 16 25.2	84 32 55.1
Private road crossing east and west .....	38 15 48.6	84 33 14.8
Milepost 271, private road crossing near .....	38 15 10.0	84 33 21.5
Semaphore No. 65 d, private road crossing east and west.	38 14 24.4	84 33 23.8
Private road crossing .....	38 13 34.7	84 33 11.8
Georgetown, overhead road crossing 0.5 mile north of....	38 13 00.4	84 32 54.4

*Geographic positions along the Cincinnati, New Orleans and Texas Pacific Railway between Williamstown and Lexington—Continued.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Georgetown, bench mark post stamped "Prim. Trav. Sta. No. 17," in vacant lot owned by Mrs. T. B. Sinclair; southeast corner of Sinclair's store bears N. 35° 30' E., distant 5.7 feet; northeast corner Catherine Conley's house bears S. 4° 30' E., distant 23.3 feet; cross cut in north foundation stone to water tank bears S. 24° 55' E., distant 152.2 feet.....	38 12 27.5	84 32 53.5
Georgetown station, road crossing 850 feet south of .....	38 12 06.1	84 32 58.0
Milepost 266 .....	38 10 56.1	84 32 31.1
Trestle No. 21, road crossing under .....	38 10 11.7	84 32 31.9
Donerail, north and south road crossing 1 mile north of..	38 09 51.0	84 32 27.4
Donerail, north and south road crossing .....	38° 08 58.7	84 32 09.8
Pike crossing northwest and southeast .....	38 07 59.2	84 31 52.1
Overhead road crossing, northeast and southwest.....	38 07 36.7	84 31 48.7
Bridge No. 650, road crossing under .....	38 02 03.9	84 51 53.3
Lawrenceburg, road crossing Court street (west rail).....	38 02 07.2	84 53 37.4
Glendale, road crossing.....	38 06 20.6	84 31 33.6
Hittenyer, road crossing under trestle .....	38 05 11.4	84 31 12.8
Leestown pike, crossing of .....	38 03 39.1	84 30 59.3

*Geographic positions along the Southern Railway between Lexington and Lawrenceburg.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Lexington, bench mark post stamped "Prim. Trav. Sta. No. 18," on property owned by Tom Smith, 2.5 feet north of gatepost at entrance to place, near Smith's rock quarry, 1 mile north of S. & C. station, and about 250 feet west of S. & C. track and 1,000 feet southeast of Pepper's distillery; powder magazine bears S. 87° 05' E., distant 98.7 feet; cross cut in northeast corner to foundation to west end of trestle on Southern Railway bears S. 15° W., distant 125.9 feet.....	38 03 14.2	84 30 55.8
Trestle No. 859, road crossing under.....	38 03 11.8	84 31 50.9
Old stone house, private crossing near .....	38 03 29.7	84 32 34.1
Paynes station, road crossing northwest and southeast, 600 feet east of.....	38 03 28.7	84 33 39.0
Van Meter station board .....	38 03 38.0	84 35 23.0
Milepost 82, private road crossing at.....	38 03 52.0	84 35 45.6
Elkchester, hole drilled in top of limestone post 36 by 8 by 5 inches, set 30 inches in the ground on property owned by C. C. Patrick, opposite railway station; southwest corner station bears N. 53° 25' E., distant 66.7 feet; cross cut on northeast corner foundation to wagon bridge bears S. 54° 30' W. distant 138.4 feet.....	38 04 18.4	84 37 09.0
Bridge, private road crossing under .....	38 04 00.0	84 37 43.9
Milepost 78, north and south road crossing at .....	38 03 24.5	84 39 20.9

*Geographic positions along the Southern Railway between Lexington and Lawrenceburg—Continued.*

Station,	Latitude.			Longitude.		
	°	'	"	°	'	"
Waiting shed, road crossing at .....	38	03	30.2	84	41	20.6
Versailles, northeast and southwest road crossing 0.75 mile east of .....	38	03	38.9	84	43	05.7
Versailles, bench mark post stamped "Prim. Trav. Sta. No. 20," on land owned by Belle Hunter; north corner post to lot bears N. 16° W., distant 12.7 feet; nail in Boise d'Arc tree bears S. 43° E., distant 4.4 feet; top to automatic gate bears N. 1° 15' E., distant 25.6 feet ..	38	03	23.9	84	43	50.8
Versailles, crossing McCracken pike at.....	38	03	22.9	84	43	52.4
Versailles, east and west road crossing 1 mile west of ....	38	03	11.5	84	44	40.0
Private road crossing north and south .....	38	02	43.6	84	45	41.5
Milner, road crossing north and south 1 mile east of .....	38	02	17.8	84	47	19.8
Milner, road crossing east and west near west switch block.	38	02	01.3	84	48	28.7
Trestle No. 68.5, north and south road crossing under ...	38	01	55.6	84	49	09.5
Trestle No. 67.7, private road crossing under.....	38	02	07.7	84	49	48.2
Tyrone, road crossing under trestle 66.0 .....	38	02	13.1	84	50	59.6
Tyrone, bench mark post stamped "Prim. Trav. Sta. No. 21," in east part of field on north side of Southern Railway, just off right of way; west corner of station bears N. 36° 30' E., distant 36.4 feet; south corner to back yard bears N. 37° 30' W., distant 177.7 feet; tall cedar post at point where wire fence joins railway fence bears N. 34° E., distant 5.7 feet.....	38	02	11.7	84	51	01.9
Bridge No. 65, road crossing under .....	38	02	03.9	84	51	53.3
Lawrenceburg, road crossing at Court street (west rail) ..	38	02	07.2	84	53	37.4

*Geographic positions along highways.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Road northwest, 25 feet north to 3-prong locust tree, 30 feet west to corner post of wire and rail fence .....	38	01	58.6	84	54	42.2
T pike northeast, 30 feet east to corner post wire and rail fence, 80 feet north to center of culvert .....	38	01	35.5	84	56	42.8
Road south from pike at sharp turn, 50 feet south to center of bridge, 15 feet west to corner rail fence .....	38	01	02.9	84	58	03.3
Creek southeast, center of covered bridge over .....	38	00	56.6	84	59	06.7
Gudgel, blue limestone post, 28 by 8 by 6 inches, with hole drilled and "U. S. G. S." cut in top in front yard of house of Lizzie Burgess, 1.2 feet from front fence, 19 feet west of gate; corner of buggy shed bears N. 77° 30' W. distant 26.6 feet .....	38	00	34.7	84	59	27.6
Covered bridge, west end of .....	38	00	41.0	84	59	40.4
Browns store, crossroads, 0.75 mile south of, 27 feet southeast to corner of rail fence, 40 feet northwest to east end water gap .....	38	01	33.4	85	00	26.6

*Geographic positions along highways—Continued.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Browns store, T road north west at, 35 feet to store, 25 feet north to gate post .....	38 02 14.2	85 00 53.5
Corinth church, northeast corner of .....	38 02 40.3	85 00 37.4
Intersection Alton pike, V. E. Perry's mail box bears S. 65° W. 35 feet .....	38 03 10.8	85 00 58.5
Scales owned by Jeff Young, center of pike opposite.....	38 04 25.6	85 00 01.4
T pike south, 25 feet southwest to corner rail fence, 12 feet north to hickory stump.....	38 04 19.8	84 58 51.0
Intersection of roads, 30 feet northwest to corner of rail fence, 57 feet north to small black oak tree.....	38 04 39.0	84 58 29.0

*Geographic positions along Southern Railway near Avenstoke.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Avenstoke, north and south road crossing 1.33 miles east of .....	38 05 34.2	84 59 16.5
Private road crossing north and south .....	38 05 58.3	84 59 49.4
Avenstoke, road crossing north and south .....	38 06 28.0	85 00 01.6
Avenstoke, bench mark post stamped "Prim. Trav. Sta. No. 23," in west corner of W. H. Murphy's front yard; west corner house bears N. 79° 50' E., distant 44.6 feet; east corner general store bears N. 59° W., distant 91 feet; southwest corner platform to well bears N. 20° 45' W., distant 42.3 feet .....	38 06 29.2	85 00 01.4

*Geographic positions along highways from Avenstoke via Hatton, Gratz, and Breck to Williamstown.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Avenstoke, center of bridge over Benson Creek, 1 mile north of .....	38 07 33.0	84 59 30.8
Graftonburg, T road south, 30 feet southwest to east corner N. W. Gibbs' store, 27 feet south to telephone pole at corner of yard .....	38 09 22.6	85 00 45.0
Road north.....	38 10 10.1	85 00 59.5
Gate across public road.....	38 10 37.1	84 01 22.2
Will Smith's house, 300 feet north, white oak tree 10 inches in diameter, triangular cross cut in east face of tree .....	38 11 16.1	85 01 60.2
Hatton, 0.75 mile south of; intersection 700 feet south of cemetery, 15 feet northwest to cedar tree 6 inches in diameter north side of road.....	38 12 50.4	85 00 37.7
Hatton, 0.5 mile south of, intersection of pike and dirt roads, 20 feet northeast to post at corner of picket fence, 18 feet south to hickory tree.....	38 13 14.2	85 00 36.5

*Geographic positions along highways from Avenstoke via Hatton, Gratz, and Breck to Williamstown—Continued.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Hatton, bench mark post stamped "Prim. Trav. Sta. No. 24," in front yard of G. W. Stockton's tenement house, opposite Roberts & Wright's general store on north side of Louisville and Nashville Railway, southeast corner brick chimney to house bears N. 3° 10' E., distant 78.5 feet, nail in sycamore tree on railway property bears S. 33° E., distant 29.8 feet. Lower hinge to front yard gate bears S. 86° 30' W., distant 23.5 feet . . .	38	13	35.4	85	00	23.6
Hatton, intersection of pikes 1 mile northeast of; 35 feet southeast to telephone pole, 45 feet northwest to telephone pole . . . . .	38	13	38.3	84	59	34.7
T road east, 30 feet southeast to Wash. Vaughn's mail box, 21 feet northeast to corner of yard fence . . . . .	38	14	41.76	84	59	44.5
Rogers store, center of pike opposite . . . . .	38	15	17.8	84	59	47.6
Jacksonville, 0.75 mile east of; T pike south, 21 feet southeast to cross cut on fence post, 15 feet southwest to cross cut on post . . . . .	38	16	28.1	84	59	49.5
Jacksonville, T road west in north part of, 9 feet west to J. N. Wilbur's mail box, 15 feet east to cross cut on rail fence . . . . .	38	16	44.9	85	00	46.0
Intersection of roads, 30 feet south to W. D. Duncan's mail box, 30 feet northwest to corner stone wall to front yard . . . . .	38	17	19.5	85	00	49.9
T road east to Scramble post-office, 18 feet southwest to cross cut on hickory tree, 24 feet northeast to E. L. Hupper's mail box . . . . .	38	19	13.4	85	00	10.3
Franklin, Henry, Shelby counties, corner of, nail in cross painted on corner post to barbed wire fence about 400 feet north of road intersection at Backbone Creek . . . . .	38	20	19.4	84	59	42.1
Franklin-Henry county line . . . . .	38	20	32.0	84	58	54.0
Thurman's store, primary station No. 27, bench mark post in east corner of Jack Thurman's front yard, cross cut on southeast corner to Jacob Thurman's residence bears N. 42° E., 33.3 feet distant, cross cut on southeast foundation corner to store bears S. 67° 15' W., distant 80.1 feet, corner post to southeast corner yard bears S. 72° 50' E., distant 11.7 feet . . . . .	38	20	37.5	84	58	00.0
Grub Ridge Church, intersection of roads at, 33 feet northeast to nail in west face of white oak tree, 30 feet southwest to crosscut on east face of stump . . . . .	38	22	13.0	84	57	50.3
Intersection of roads . . . . .	38	23	12.3	84	57	33.0
Pot Ripper Creek, road intersection at, 900 feet southwest of Lucy Hall's residence . . . . .	38	24	12.1	84	57	47.5
Lockport, intersection of roads 1 mile south of, 18 feet south to cross cut on corner fence post, 21 feet west to corner fence post . . . . .	38	25	16.7	84	57	49.5
Lockport, Bridge and Main streets, 37 feet southeast to iron pump, 40 feet south to corner yard fence . . . . .	38	26	12.4	84	57	56.8
Gratz, road intersection 0.5 mile southwest of . . . . .	38	28	10.2	84	57	42.0



*Geographic positions along highways from Avenstoke via Hatton, Gratz, and Breck to Williamstown—Continued.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Gratz, 0.5 mile southwest of; primary traverse station No. 28, bench mark post set in E. T. Shannon's front yard, at forks of roads, southeast corner of Shannon's house bears N. 39° 45' W., distant 43 feet, horseshoe nailed to walnut trees bears N. 71° 45' E., distant 11.8 feet .....	38 28 11.0	84 57 42.7
Gratz, Main and Brown streets .....	38 28 24.6	84 57 14.1
Intersection of pike and dirt road .....	38 28 39.3	84 56 08.2
Crossroads southeast, about 400 feet south of junction of Savern Creek and Mint Spring Branch .....	38 28 01.0	84 54 50.4
E. H. Sparks' front yard gate, of residence of, on Savern Creek .....	38 27 53.6	84 53 29.1
Intersection of pike and dirt road south near Victor Wilburt's residence .....	38 27 17.2	84 51 46.9
Ep, road intersection $\frac{1}{4}$ mile south of; 40 feet east to cross cut on corner fence post, 24 feet to cross cut on corner post .....	38 27 39.4	84 50 34.7
Greenups Baptist Church, primary traverse station No. 29, bench mark post in front yard of church, 4 feet south of retaining wall, nail in cross cut on east face of beech tree 3 feet in diameter bears N. 85° 45' W., distant 70.2 feet, northeast corner of church bears S. 3° 45' E., distant 30.7 feet .....	38 27 19.2	84 50 14.3
Greenups schoolhouse, crossroads at, 30 feet southeast to Shipp's mail box, 15 feet northeast to southwest corner of tollgate house .....	38 27 07.9	84 49 34.0
Hester, intersection of Monterey-Owenton and Georgetown pikes .....	38 27 48.0	84 46 36.7
Old tollgate house, pike intersection .....	38 28 17.2	84 45 25.1
Smith's schoolhouse, T road east, 30 feet northeast to cross on corner fence post .....	38 28 52.8	84 44 36.7
Breck post-office, primary traverse station No. 30, bench mark post in northeast corner J. H. Davis's front yard, southwest corner post-office bears S. 89° 30' E., 9.3 feet distant; southwest corner J. H. Davis's residence bears S. 35° E., distant 73.5 feet .....	38 29 19.1	84 44 14.6
Pike intersection (old location of Breck post-office) .....	38 29 45.2	84 44 07.8
Lusby's mills, pike intersection 1 mile south of, near A. L. Lockhardt's residence .....	38 30 46.2	84 43 17.6
Lusby's mills, west end of covered bridge .....	38 31 47.4	84 43 13.6
East gatepost to road, through Riley Kimvan's farm .....	38 32 21.6	84 42 13.6
Clegg, road intersection 0.25 mile northwest of .....	38 33 07.7	84 41 34.6
William Glenn's farm, white oak tree used as gatepost at entrance to, cross cut on tree .....	38 34 06.1	84 40 14.1
Lawrenceville, crossing of pikes at, 40 feet northeast to southwest corner blacksmith shop, 45 feet northwest to L. B. Hollbrook's mail box .....	38 34 05.3	84 39 00.2
T. S. Scroggs's mail box .....	38 35 18.2	84 38 24.2

44 PRIMARY TRIANGULATION AND PRIMARY TRAVERSE. [BULL. 245.

*Geographic positions along highways from Avenstoke via Hatton, Gratz, and Breck to Williamstown—Continued.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Heekin, T road northwest at, 18 feet southeast to north corner of platform at store, 40 feet north to cross on telephone pole.....	38 36 01.5	84 36 52.7
Road northwest, 12 feet southeast to cross on telephone pole, 35 feet north to R. W. Vance's mail box.....	38 36 29.4	84 36 16.7
Williamstown, 2 miles south of; pike intersection; 24 feet northwest to James Penwick's mail box, 40 feet northeast to front yard gate.....	38 37 43.1	84 36 03.3

*Geographic positions along the Frankfort and Cincinnati Railway between Hatton and Georgetown.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Pike crossing northeast and southwest.....	38 13 31.7	85 00 08.6
Milepost 36, 1,060 feet east of; road crossing east and west.	38 12 48.9	84 59 02.5
Benson station, road crossing east and west, 80 feet northwest of.....	38 12 25.2	84 57 37.2
Pike crossing north and south.....	38 12 32.5	84 56 16.3
Road crossing.....	38 12 41.5	84 55 50.5
Road crossing east and west.....	38 12 49.2	84 55 11.3
Kennebec station, road crossing east and west.....	38 12 28.8	84 54 46.5
West Frankfort, pike crossing northwest and southeast west of water tank.....	38 12 14.0	84 53 07.9
Frankfort, primary traverse station No. 25, bench mark post set in west corner of capitol grounds, 4.5 feet distant to corner fence post, 230.6 feet to west corner post porch of capitol building.....	38 11 59.7	84 52 38.8
Overhead road crossing, north and south.....	38 12 32.1	84 50 44.8
Sedmanstown, road crossing at.....	38 13 13.6	84 49 10.6
Elkhorn station, road crossing at Boles Bros. stables (private).....	38 13 08.6	84 47 58.6
Road crossing, east and west.....	38 14 08.4	84 46 47.1
Road crossing, north and south at T road north.....	38 15 00.9	84 46 12.6
Switzer, pike crossing east and west, 1,100 feet southwest of station.....	38 15 10.1	84 45 25.3
Lead works, road crossing at.....	38 15 51.6	84 44 26.5
Bridge, road crossing under.....	38 15 52.6	84 43 00.6
Stamping Ground, primary traverse station No. 26, bench mark post in front yard to Doctor Reilly's residence; east corner of foundation to house bears S. 57° 10' W., 120.7 feet distant; east corner of J. R. Russell's house and jewelry repair shop bears N. 36° W., distant 24.53 feet. The post is 2 feet south of Frankfort and Cincinnati Railway right of way.....	38 16 13.6	84 41 11.3
Stamping Ground, Frankfort pike crossing near west end of switch.....	38 16 15.1	84 41 13.1
Pike crossing, north and south.....	38 15 33.7	84 40 31.1

*Geographic positions along the Frankfort and Cincinnati Railway between Hatton and Georgetown—Continued.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Duval, pike crossing north and south .....	38	14	49.3	84	38	27.6
Road crossing, north and south under trestle.....	38	14	29.8	84	37	28.2
Johnson station, pike crossing at .....	38	14	25.6	84	35	48.9
Private road crossing, east and west .....	38	13	35.9	84	35	05.5
Private overhead road crossing, north and south.....	38	13	15.3	84	34	16.7

Daviess, Henderson, and Ohio counties; Calhoun and Sutherland quadrangles.

The following geographic positions were determined from primary traverse in 1903 and 1904 by Mr. J. R. Ellis, topographic aid. The line starts from adjusted position at Owensboro and follows Illinois Central Railroad to Philpot; thence follows highways to Nocreek and is tied to adjusted position there.

*Geographic positions along the Illinois Central Railroad between Owensboro and Philpot.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Owensboro station .....	37	46	01.5	87	06	40.5
Owensboro, just east of, crossing of Illinois Central and Louisville and Nashville railroads .....	37	46	11.4	87	05	34.8
Road crossing, private, northeast and southwest .....	37	45	08.8	87	04	52.0
Road crossing, private, north and south .....	37	44	55.6	87	03	37.3
Oakridge, road crossing at .....	37	44	31.5	87	02	22.5
Wagon bridge, road crossing at .....	37	43	40.5	87	00	35.3
Spur, road crossing at .....	37	43	42.9	86	59	25.6

*Geographic positions along highways.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Philpot, aluminum tablet cemented in top of sandstone post in south corner of J. B. Compton's yard. The north face of large black oak bears S. 31° E., distant 21 feet. The south corner of J. B. Compton's residence bears N. 52° E., distant 26.6 feet. Post marked "primary traverse station No. 1" .....	37	43	47.9	86	58	48.4
T road southwest.....	37	43	12.9	86	58	03.8
T road west, 20 feet northwest is corner post of bridge and barbed-wire fence. Arrow cut on post showing direction of traverse .....	37	42	35.3	86	58	19.5
T road east, 30 feet northeast to old walnut tree, 110 feet south to tall dead tree .....	37	42	05.0	86	58	29.6
Miller's mill road, at T road north, 12 feet east to sign-board .....	37	41	09.5	86	58	47.8

*Geographic positions along highways—Continued.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Crossroads, 20 feet west is guide post, 28 feet north of large stone.....	37	40	27.6	86	58	23.8
Harrison schoolhouse, T road east; 15 feet west to corner of fence post, 45 feet east to mail box.....	37	39	55.4	86	58	01.1
The Chapel, road south at; 15 feet west to mail box, 10 feet north to east end of small box culvert.....	37	39	12.3	86	57	22.2
Laffoon post-office, center of road in front of.....	37	38	26.0	86	56	30.8
Laffoon post-office, 0.25 mile southeast of, forks of road, 40 feet north to dead white-oak tree, 80 feet south to bridge.....	37	38	12.1	86	56	17.9
Panther Creek, center of bridge over, line between Daviess and Ohio counties.....	37	37	45.6	86	56	32.9
Primary traverse station No. 2, aluminum tablet cemented in sandstone post. Station is 15 feet south west of T road north at J. T. Brasheard's residence and blacksmith shop on south side of road, 3 feet from picket fence. A black gum tree 16 inches in diameter with cross on east side bears due west, distance 10 feet. Southwest corner post of Brasheard's yard fence bears N. 38° 45' E., distant 32 feet.....	37	37	09.8	86	56	30.2
T road east, 33 feet south to black gum tree, 22 feet west-south west to gatepost, and is 600 feet northeast of Sturrett's store.....	37	36	47.5	86	55	57.1
Westerfield, 0.25 mile north of, intersection of roads.....	37	36	00.5	86	55	45.0
Westerfield, crossroads at, 35 feet north to door of King's store, 30 feet northwest to small silver poplar tree in front of post-office.....	37	35	41.9	86	55	39.4
Westerfield, 0.66 mile south of, top of small hill.....	37	35	07.1	86	55	36.9
T road east to Taffy, 25 feet northeast to south end of culvert 27 feet southeast to tall corner fence post.....	37	34	32.8	86	55	24.8
T road northeast, 400 feet north of Chapman residence, 30 feet north to gatepost, 33 feet east to corner rail fence..	37	33	05.6	86	56	15.1
Branch, T road east at, 30 feet north to corner of picket fence, 42 feet south to corner of picket fence.....	37	32	23.8	86	56	00.5
T road east, 12 feet east to corner post of picket fence, 15 feet west to stump.....	37	31	51.0	86	56	03.4
Intersection of Owensboro and Hartford and Miller's mill roads, 33 feet northwest to telephone post at small bridge, 15 feet to south corner of bridge.....	37	30	49.3	86	56	59.5
Breda post-office, intersection of Hartford and Owensboro road and road to Nocreek post-office, 20 feet east to elm tree 14 inches diameter, 50 feet southeast to telephone pole.....	37	30	25.8	86	56	48.1
Nocreek, church, 0.5 mile north of, T. road east, 260 feet north of turn in road.....	37	29	14.6	86	57	17.1
Nocreek post-office, T road south at, primary traverse station No. 3. Hole drilled in top of sandstone post in northeast corner of J. P. Foster's farm. Station is 2.5 feet west of large mulberry tree at fence corner. Southwest corner of porch to Nocreek post-office bears N. 46° 35' E., distant 85 feet. Corner stone at T road north bears N. 50° 45' W., distant 50.8 feet. Post marked "U. S.".....	37	28	58.0	86	57	10.4

This line starts from the Henderson astronomic pier and follows public highways via Delaware, Cleopatra, and Glenville to Utica.

*Geographic positions along highways between Henderson and Utica.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Henderson, astronomic pier.....	37 50 24.80	87 35 26.10
T road southwest .....	37 47 03.2	87 30 13.3
Crossroads.....	37 44 32.6	87 26 53.9
Euterpe post-office, T road at .....	37 42 59.1	87 26 34.6
Crossroads.....	37 42 21.5	87 25 28.6
Delaware; Henderson and Delaware road, at road north, ½ mile northwest of.....	37 41 32.1	87 24 48.6
Delaware; Delaware and Salem Church road, at T road northwest, ¾ mile southeast of.....	37 40 34.6	87 23 50.8
T road south.....	37 39 00.9	87 21 13.5
Salem Baptist Church, northeast corner of.....	37 38 18.1	87 20 01.1
Puyear schoolhouse, T road west at .....	37 37 44.2	87 19 00.0
Cleopatra, T road south at .....	37 37 23.9	87 17 36.9
Schoolhouse, T road north at.....	37 36 32.7	87 17 07.6
Guffy post-office, crossroads at .....	37 36 19.3	87 15 11.3
T road south.....	37 36 19.6	87 13 28.8
Glenville, T road at church, near.....	37 35 43.8	87 11 29.1
T road south.....	37 35 19.5	87 10 29.6
Crossing of Glenville and Livermore and Glenville and Utica roads .....	37 35 05.5	87 09 40.9
Utica, T road north at.....	37 36 16.2	87 06 49.9

**Union and Webster counties; Sebree quadrangle.**

The following geographic positions were obtained from primary traverse run in 1904 by Mr. J. R. Ellis. The line starts from Elmwood, Ky., and follows the Louisville and Nashville Railroad to Slaughterville, thence by public highways via Vanderburg to West Vanderburg, thence along Illinois Central Railroad to Lisman. From Lisman the line follows public highways via Free Union, Luzon, Tilden, and Herman to Waverly, where it is tied to point located by primary traverse in 1902.

*Geographic positions along the Louisville and Nashville Railroad between Elmwood and Slaughterville.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Elmwood, road crossing at. ....	37 31 42.7	87 29 24.8
Bridge No. 195, over creek. ....	37 30 57.8	87 29 22.3
Slaughterville station, 120 feet north of, road crossing ...	37 29 27.0	87 29 47.1
Slaughterville, aluminum tablet cemented in top of limestone monument 25 by 6 by 8 inches, set 23 inches in the ground, and located in southwest corner of Dr. W. C. Casby's yard, 7 feet east of corner of yard fence, 23 feet northeast to bay window and is 18 inches north of south fence to yard; stamped "Prim. Trav. Sta. No. 4" ...	37 29 26.4	87 30 00.9

*Geographic positions along highways.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Slaughterville, 0.66 mile west of; intersection of roads, 20 feet south to corner of yard fence, 20 feet south to corner post of small lot. ....	37 29 23.9	87 30 46.1
T road west. ....	37 29 11.8	87 31 15.7
Road northeast, 15 feet north to stump, 17 feet south to tree at intersection of 3 fences. ....	37 29 12.2	87 32 57.6
Intersection of Henderson and Madisonville road and road to Vanderburg at Woods's house (log), 45 feet northeast to front gate, 33 feet west to locust tree. ....	37 29 06.7	87 33 22.8
Dim road east. ....	37 28 56.9	87 33 31.2
T lane south, 30 feet southwest to cherry tree at corner of fence, 20 feet northeast to double walnut tree. ....	37 28 45.5	87 34 11.0
Road north at small bridge 1,400 feet east of James's sawmill, 10 feet west to center of small bridge at east mouth to lane. ....	37 28 38.7	87 35 15.4
T road northeast, 12 feet east to center of small bridge, 33 feet to corner of rail and picket fence. ....	37 28 20.0	87 36 27.6
Deer Creek, T road northwest, 265 feet west of bridge over, 18 feet south to picket fence, 35 feet north to large birch tree. ....	37 28 19.2	87 36 57.5
Road east, 18 feet south to telephone pole, 35 feet east to tree at corner of picket fence. ....	37 29 16.2	87 38 04.3
Vanderburg, bronze tablet cemented in top stone terrace step to C. H. Edwards's front walk, N. 5° E. and 35 feet to center of front door of residence, N. 78° 15' W. and 28 feet to black locust tree 15 inches in diameter, 5.8 feet south to front gate; stamped "Prim. Trav. Sta. No. 5" ...	37 29 19.5	87 38 31.8
Vanderburg, intersection of roads at blacksmith shop, 27 feet southwest to sycamore tree in middle of road, 28 feet northeast to west corner of shop. ....	37 29 19.9	87 38 37.0

*Geographic positions along the Illinois Central Railroad between West Vanderburg and Lisman.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
West Vanderburg, Illinois Central Railroad crossing at ..	37 29 04.1	87 41 31.3
Road crossing northeast and southwest, 360 feet east of milepost 15.....	37 28 32.4	87 41 51.9
Road crossing east and west.....	37 28 26.9	87 42 31.0
Lisman station, road crossing 120 feet west of.....	37 28 13.5	87 43 45.3
Lisman and Free Union road crossing.....	37 28 28.5	87 44 32.5

*Geographic positions along highways.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Lisman, 1 mile northwest of, crossroads.....	37 28 57.0	87 45 00.5
Crossroads, Lisman and Clay road and Dixon and Clay road, 30 feet southwest to black gum tree, 48 feet south to corner of picket and rail fence.....	37 29 21.7	87 45 22.9
Lisman, 2 miles north of, aluminum tablet cemented in top of sandstone post 6 by 8 by 24 inches, set in ground; in northeast part of George Wilson's front yard, at intersection of Dixon and Clay roads, east corner of north chimney of Wilson's house bears S. 82° W.; large white oak tree in front yard bears S. 11° 15' W., distant 49 feet; northeast corner front fence bears S. 69° 30' E., distant 33 feet; tablet stamped "Prim. Trav. Sta. No. 6".....	37 29 43.8	87 44 44.3
Caney Creek, center of bridge over.....	37 30 57.6	87 45 26.5
Free Union, 0.5 mile west of; intersection of roads, 40 feet west to wire fence corner, 60 feet east to telephone pole.....	37 31 33.3	87 45 38.1
Free Union, center of bridge over Craborchard Creek....	37 31 34.3	87 45 00.9
Henderson's tobacco factory, T road north at 20 feet northwest to arrow cut on corner of board fence, 18 feet southwest to west corner of factory.....	37 31 43.0	87 43 57.0
T road west.....	37 32 05.0	87 43 42.7
Luzon post-office, crossroads at, 15 feet northeast to telephone pole, 15 feet west to large stone at east corner of post-office porch.....	37 32 42.9	87 43 22.1
Lanes southwest.....	37 34 10.5	87 42 26.9
Road southeast at top of hill, corner stone in middle of road at, 12 feet west to stump 22 feet southeast to rail fence corner.....	37 34 44.2	87 42 26.8
Jones' tobacco factory, T road west about 450 feet south of, 24 feet southwest to rail fence corner, 21 feet northwest to corner of rail and wire fence.....	37 35 01.9	87 42 24.6
Tilden, 0.5 mile south of, center of bridge <sup>d</sup> over creek at forks of roads.....	37 35 53.1	87 42 11.0
Tilden, T road north at; 18 feet northeast to corner of Jopps' front yard fence, 40 feet south to northwest corner of Townsend's store.....	37 36 20.2	87 42 40.0

*Geographic positions along highways—Continued.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Highland church, crossroads at, 20 feet northeast to front of church, 45 feet northwest to center of small bridge.....	37 36 28.7	87 43 13.4
Road south through woods, 30 feet west to center of bridge over branch.....	37 36 46.4	87 43 55.8
Intersection of Morganfield and Madisonville and Uniontown road; west 20 feet is corner post to picket fence, northeast 20 feet is corner of rail fence.....	37 36 52.4	87 44 29.0
County line, 25 feet west of, bronze tablet cemented in sandstone post 7 by 8 by 25 inches, set 22 inches in ground in south corner of A. J. Kennedy's farm on inside of fence, 4 feet northeast of corner post. South 30° 10' west and 72 feet distant from station is north corner of north chimney to tenant house on L. R. Higginson's farm. South 20° west and 90 feet distant is black gum tree.....	37 37 24.3	87 45 10.9
Kennedy church, crossroads at, 27 feet southwest to A. J. Kennedy's mail box, 40 feet northwest to H. V. Tilly's mail box.....	37 37 41.5	87 45 17.5
Anderson Creek, 2,000 feet northwest of, road intersection 20 feet northwest to R. O. Cromwell's mail box, 21 feet northeast to corner of wire and picket fence.....	37 38 21.7	87 45 50.9
Herman post-office, T road northwest at, 4 feet east to large stump, 30 feet north to southeast corner of post-office.....	37 39 10.4	87 45 30.2
Herman post-office, 1.25 miles northwest of, T road southeast.....	37 39 47.1	87 46 34.4
T road northwest, 20 feet east to corner of orchard fence, 26 feet north to gatepost.....	37 40 33.5	87 47 09.6
Waverly, 1 mile southeast of; road intersection, 17 feet east to J. B. Austin's mail box.....	37 41 47.7	87 48 23.5
Waverly, T road northwest in southeast part of, 35 feet west to corner of wire fence, 35 feet northwest to telephone pole.....	37 42 21.3	87 48 41.0
Waverly, in garden in north corner of H. T. Willet's front yard, in sandstone post, bronze tablet stamped "Prim. Trav. Sta. No. 8," 3 feet from fence corner....	37 42 42.9	87 48 48.1
Waverly, road crossing 55 feet west of station.....	37 42 45.5	87 48 46.1

## LOUISIANA.

## PRIMARY TRAVERSE.

East and West Baton Rouge, East and West Feliciana, and Pointe Coupee parishes; Bayou Sara quadrangle.

During the month of December, 1903, 81 miles of primary traverse were run by Mr. E. L. McNair, topographer, beginning at St. Francisville and following the Yazoo and Mississippi Valley Railway (Woodville Branch) northward to Laurel Hill; thence northeast and east via



public roads to Norwood on the Yazoo and Mississippi Valley Railroad; thence south along this railway to Baton Rouge; thence northeasterly via public road to Comite post-office.

Positions are based upon the Baton Rouge datum as given in the report of the Chief of Engineers for 1887, Part IV, page 2783.

*Geographic positions along Woodville Branch of Yazoo and Mississippi Valley Railroad between St. Francisville and Laurel Hill.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
St. Francisville, cross on Catholic church .....	30 46 33.3	91 23 22.8
Bains flag station, road crossing 1.5 miles south of.....	30 48 34.1	91 23 16.5
Bains flag station, road crossing 700 feet south of .....	30 49 46.2	91 23 06.9
Catalpa flag station, road crossing 0.6 mile north of .....	30 51 44.1	91 22 08.7
Brothers flag station.....	30 53 23.4	91 21 02.1
Milepost 14, road crossing 350 feet south of .....	30 55 30.9	91 20 08.0
Laurel Hill station, north end of .....	30 57 14.9	91 20 23.8

*Geographic positions along highways between Laurel Hill and Norwood.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Laurel Hill, 1.75 miles northeast of, crossing of West Fork of Thompsons Creek .....	30 58 10.1	91 19 13.5
Laurel Hill, 3.5 miles northeast of, forks of road near store.....	30 59 08.0	91 17 58.9
Louisiana-Mississippi State line, four corners near D. E. Perkins's store .....	31 00 00.3	91 17 16.4
Thompsons Creek, 0.4 mile west of, forks of second-class road .....	31 00 05.2	91 15 13.9
Thompsons Creek, 1 mile east of, forks of road, north, south, and southwest.....	31 00 30.0	91 13 54.8
Church, forks of road, 0.25 mile northeast of .....	30 59 04.8	91 13 34.9
Forks of road, roads east, west, and south near cabins... ..	30 58 18.3	91 12 48.5
East Fork of Thompsons Creek, 0.6 mile east of, forks of road, signboard, "Store 1 mile" .....	30 58 09.2	91 10 59.6
Norwood, 4 miles west of, four corners at Canty Stanley's house .....	30 57 48.1	91 09 18.7
Norwood, 1.25 miles west of, forks of road.....	30 58 44.5	91 07 05.5

*Geographic positions along Yazoo and Mississippi Valley Railroad between Norwood and Baton Rouge.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Norwood station, road crossing 350 feet north of.....	30	58	06.2	91	06	15.8
Norwood, I. D. Norwood's brick store, bronze tablet in northeast corner of.....	30	58	07.6	91	06	17.5
Norwood, road crossing 2 miles south of.....	30	56	25.3	91	06	20.5
Wilson station, street crossing 350 feet north of.....	30	55	12.0	91	06	57.5
Milepost 120.....	30	53	42.3	91	07	35.3
Gayden station, road crossing at.....	30	52	12.8	91	08	02.3
McManus station, road crossing 170 feet south of.....	30	50	01.4	91	08	07.1
Ethel station.....	30	47	26.8	91	07	51.9
Head block of switch, 450 feet south of milepost 110.....	30	45	02.2	91	08	12.5
Slaughter station, street crossing 125 feet north of.....	30	43	07.8	91	08	34.6
Milepost 105, road crossing 1,900 feet north of.....	30	41	06.4	91	08	58.1
Zachary station.....	30	38	57.0	91	09	23.1
Baker station, road crossing 3,500 feet north of.....	30	36	05.1	91	09	56.4
Baker station.....	30	35	30.5	91	10	03.0
Maryland siding, road crossing at.....	30	33	09.0	91	10	30.4
Scotland station, road crossing at.....	30	31	28.5	91	10	49.8
Scotland, road crossing 0.6 mile south of.....	30	30	56.1	91	10	56.0
Baton Rouge station, 1.75 miles north of, road crossing near end of siding.....	30	28	19.4	91	11	17.3
Baton Bouge, round brick chimney on State penitentiary.....	30	27	04.2	91	10	55.6

*Geographic positions along public road between Baton Rouge and Comite.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Baton Rouge, Cowboys' Exchange, road north at.....	30	27	14.9	91	10	00.7
Three corners, road north.....	30	28	11.6	91	07	38.9
Three corners, road north.....	30	29	04.7	91	05	21.7
Comite store and post-office, 300 feet southwest of, a marble post 30 by 6 by 3 inches set 22 inches in the ground, "G. S." cut on top of post.....	30	30	25.7	91	01	58.5
Comite store and post-office, 160 feet northeast of, a marble post 30 by 6 by 3 inches set 28 inches in ground. "G. S." cut in top of post. Posts are 453 feet apart, azimuth between them 214° 25' 35".....	30	30	29.4	91	01	55.5

## MARYLAND.

## PRIMARY TRAVERSE.

Caroline and Queen Anne counties; Barclay quadrangle.

The following geographic conditions were determined from primary traverse in 1903 by Mr. C. B. Kendall, field assistant. The line starts from Hartley triangulation station, United States Coast and Geodetic Survey and runs west along highways to the Delaware-Maryland line, connecting with Switzer's farm boundary post, thence north and west along border of quadrangle to point near northwest corner of same, thence south along west border of quadrangle to Hope triangulation station, United States Coast and Geodetic Survey, thence south to border of quadrangle and east along same, tying to adjusted traverse position 2 miles north of Greensboro. Positions are given on the United States standard datum.

*Geographic positions along highways.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Hartley triangulation station, U. S. Coast and Geodetic Survey .....	39	10	48.86	75	40	17.80
Road south at three corners .....	39	11	02.0	75	40	56.4
Four corners, 70 feet northeast to corner of dwelling, 25 feet to mail box .....	39	11	33.1	75	42	02.5
Four corners .....	39	11	24.4	75	43	10.0
Negro schoolhouse, three corners at, 60 feet southwest to corner of schoolhouse, 33 feet southeast to dwelling .....	39	10	52.3	75	44	14.3
Three corners, 20 feet north to large tree on hedge line, 40 feet south to mail box on hedge line .....	39	12	01.0	75	44	47.2
Switzer's farm, state line boundary post .....	39	11	59.3	75	45	09.3
Three corners at negro schoolhouse, 54 feet west to east corner of school, 60 feet to chestnut tree .....	39	13	34.3	75	44	14.5
Bourke's Corners, 30 feet northwest to mail box, 40 feet to southwest corner of Bourke's store .....	39	13	51.7	75	44	34.1
Center of bridge over stream .....	39	14	47.6	75	45	00.9
Hazel's schoolhouse, three corners at, 36 feet southwest to face of oak tree, 4 feet north to line stone, 68 feet northwest to corner of schoolhouse .....	39	15	38.3	75	44	43.6
Road to north, three corners at, 25 feet east to corner of fence, end of hedge, 30 feet to corner of picket fence .....	39	15	18.3	75	46	46.0
Four corners, 40 feet northwest to mock orange tree, 35 feet northeast to corner of hedge fence .....	39	15	17.5	75	48	48.9
Fork to north, three corners at .....	39	15	22.9	75	49	51.9
Millington, east edge of Sassafras street at junction with Cypress street .....	39	15	29.3	75	50	18.1

*Geographic positions along highways—Continued.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Four corners, 25 feet southwest to telegraph pole, 30 feet northwest to gate post .....	39 15 05.0	75 50 56.7
Queen Mills, east edge of road at Forks, 450 feet south of.	39 14 52.0	75 51 49.8
Four corners, 20 feet northwest to corner of hedge, 40 feet southeast to telephone pole .....	39 14 37.5	75 52 37.4
Road to south at three corners .....	39 14 15.0	75 53 52.0
Cemetery, four corners at, 32 feet northeast to corner post of iron fence, 33 feet northwest to corner post of wood fence .....	39 13 54.5	75 54 52.4
McGwines, three corners just west of, 30 feet northeast to mail box, 30 feet northwest to stump .....	39 13 10.0	75 57 13.0
Maple Creek drain bridge, three corners 215 feet west of, 59 feet southeast to nail in sweet gum tree, 56 feet southwest to nail in fence post .....	39 12 39.1	75 59 01.7
Three corners, 25 feet northwest to corner fence post, 50 feet southeast to cedar tree .....	39 11 19.7	75 59 20.7
Four corners, 22 feet northeast to corner of fence 60 feet northwest to large oak tree .....	39 10 06.5	75 59 02.7
Road to west, 3 corners at, 20 feet northwest to corner of fence, 30 feet east to cedar tree .....	39 09 16.7	75 58 54.0
Church Hill, junction of Main and Walnut streets at, 27 feet southeast to lamp-post, 32 feet northeast to telephone pole .....	39 08 32.2	75 59 08.4
Three corners, 28 feet east to sycamore tree, 50 feet south to cedar tree .....	39 07 50.4	75 58 34.7
Four corners, 38 feet northwest to fence corner, 22 feet southeast to pear tree .....	39 06 44.0	75 58 34.6
Three corners, 25 feet southwest to pear tree, 42 feet north to corner post of wire fence .....	39 05 24.1	75 58 45.2
Ashland station, center of road crossing Philadelphia, Wilmington and Baltimore Railroad .....	39 04 43.2	75 58 38.7
Road crossing, center of track at .....	39 03 51.9	75 59 27.4
Carvell station, nail at northwest corner of road crossing.	39 02 49.5	76 00 18.1
Hope triangulation station, U. S. Coast and Geodetic Survey .....	39 02 33.3	75 59 18.1
Hope, four corners at, 36 feet north to post of stoop at store, 60 feet south to walnut tree .....	39 02 30.1	75 58 10.8
Three corners .....	39 01 52.0	75 57 57.1
Ruthsburg, four corners at, 57 feet northwest to nail in post at corner of shop, 35 feet southeast to nail in post at corner of fence .....	39 00 12.3	75 57 29.7
Norman schoolhouse, forks of road .....	39 00 33.5	75 56 12.4
Bridge over Masons Branch, four corners, 280 feet east of, 27 feet northwest to pine tree .....	39 00 14.7	75 54 39.2
Negro cabin, three corners near, 5 feet east to large kick-ory tree .....	39 01 06.8	75 52 38.2
Lockman schoolhouse, three corners 1,500 feet east of....	39 00 49.5	75 51 50.1

*Geographic positions along highways—Continued.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Three corners, 32 feet west to big stone, 44 feet south to old stump .....	39 00 41.7	75 50 56.4
New house, east edge of road at, three corners 150 feet west of, 18 feet northeast to oak tree.....	39 00 14.0	75 49 19.4
Schoolhouse, three corners 500 feet east of .....	39 00 38.9	75 48 31.6
Greensboro, three corners about 2 miles north of, 30 feet northwest to cedar tree, 50 feet southwest to peach tree .....	39 00 05.1	75 47 33.9
Sewells Mills, three corners at .....	38 59 46.3	75 46 48.5
Three corners .....	38 59 43.7	75 45 29.1
Schelther's farm, State line boundary post.....	38 59 48.3	75 44 10.9

**Caroline and Talbot counties; Denton quadrangle.**

The following geographic positions were determined from primary traverse in 1903 by Mr. C. B. Kendall, field assistant. Starting at Schelther's farm boundary post, on the Delaware-Maryland State line, the line follows highways south along east border of quadrangle to southeast corner, thence west along south border of same, connecting with adjusted traverse position at Bethlehem. Positions are given on the United States standard datum.

*Geographic positions along highways.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Boyces Mills, three corners just west of .....	38 59 21.3	75 45 52.7
Schoolhouse, four corners at, 50 feet southeast to oak tree, 83 feet northwest to large pine tree .....	38 57 47.5	75 45 55.3
Sawmill, four corners at, 21 feet south to old stump, 29 feet west to nail in stake .....	38 56 08.5	75 46 36.0
Gilton Camp grounds, 75 feet northeast to corner of school, 40 feet west to hickory tree .....	38 55 15.5	75 45 20.7
Jopps Corners, 11 feet south to corner post wire fence, 39 feet north to apple tree .....	38 54 16.6	75 46 25.6
Forks of road, 25 feet west to pine tree, 27 feet northeast to J. P. Warren's mail box.....	38 53 05.8	75 46 36.8
Anthony's Mills, forks of road, 30 feet west to persimmon tree, 68 feet east to southwest corner of mill.....	38 52 41.0	75 47 19.5
Hobbs, forks of road at Ames Church just northwest of, 90 feet northwest to southeast corner of church.....	38 51 45.5	75 47 17.3
Hobbs station, center of Queen Anne's Railroad track at road crossing, 55 feet east of.....	38 51 35.6	75 47 06.1

*Geographic positions along highways—Continued.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Andersontown, three corners 0.25 mile north of, 32 feet southwest to telephone pole, 14 feet east to old stump...	38	50	27.8	75	47	06.8
Andersontown, forks of road at schoolhouse, 75 feet southeast to schoolhouse .....	38	50	04.8	75	46	43.3
Four corners, 27 feet southwest to corner post, 51 feet northwest to telephone pole .....	38	48	50.7	75	47	00.7
Concord, three corners just east of .....	38	48	06.2	75	47	10.5
Three corners, 25 feet southeast to mail box, 36 feet northwest to corner post of wire fence .....	38	46	46.2	75	47	17.0
Chestnut Grove Church, three corners 600 feet east of, 115 feet west to bridge over Wolf Pit Branch .....	38	45	22.3	75	47	15.2
Three corners, 30 feet northeast to pine tree, 25 feet west to cedar tree .....	38	45	15.2	75	47	55.3
American Corners, four corners at, 44 feet south to corner of Redman & Sons' store, 36 feet northwest to Towers' store .....	38	46	03.4	75	49	09.9
American Corners, four corners 1 mile west of, 20 feet north to corner fence post, 40 feet west to pole fence...	38	46	03.0	75	50.	30.9
Forks of road, 20 feet east to mulberry tree, 45 feet west to forked pine tree .....	38	45	58.9	75	51	22.4
Three corners, 18 feet southwest to mail box, 50 feet north to sycamore tree .....	38	45	43.0	75	52	41.8
Three corners, 35 feet east to apple tree, 10 feet west to cedar tree .....	38	45	20.4	75	53	23.9
Four corners .....	38	45	51.0	75	54	41.7
Henerys' store, 4 corners at, 30 feet south to corner of store, 36 feet west to cedar tree .....	38	45	34.8	75	55	31.3

**Anne Arundel, Howard, Montgomery, and Prince George counties; Laurel quadrangle.**

The following geographic positions were determined from primary traverse in 1903 by Mr. C. B. Kendall, field assistant.

The line starts from adjusted primary traverse position at Ellicott City and follows Baltimore and Ohio Railroad to Annapolis Junction, thence to Odenton via Annapolis, Washington and Baltimore Railroad, thence to Bowie via Pennsylvania Railroad. From Bowie the line follows highways along south border of quadrangle to southwest corner of same and north to Stabler triangulation station, United States Coast and Geodetic Survey. From Stabler the line follows highways north along west border of quadrangle to adjusted primary traverse position at Glenelg. Positions are given on the United States standard datum.

*Geographic positions along the Baltimore and Ohio Railroad between Ellicott City and Annapolis Junction.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Ilchester, east track, opposite station .....	39 14 58.2	76 45 54.5
Orange Grove, east track, opposite station.....	39 14 30.2	76 44 56.7
Vineyard, west track, over road crossing.....	39 13 54.7	76 44 07.5
Avalon station, south track at road crossing.....	39 13 44.1	76 43 19.3
Relay station, opposite east entrance to telegraph office ..	39 13 23.2	76 42 45.4
Elkridge station, east track at road crossing.....	39 12 55.1	76 42 38.8
Hanover station, north track at road crossing.....	39 11 32.9	76 43 27.5
Smith's sand bank, west track at road crossing.....	39 11 08.7	76 44 32.0
Dorsey station, west track at road crossing.....	39 10 41.4	76 44 52.5
Montevideo station, west track at road crossing.....	39 09 44.9	76 46 02.7
Jessups station, point between tracks at road crossing....	39 09 06.2	76 46 35.6
Annapolis Junction, road crossing 400 feet southwest of station.....	39 07 30.5	76 47 28.7

*Geographic positions along the Annapolis, Washington and Baltimore Railroad between Annapolis Junction and Odenton.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Road crossing.....	39 06 46.0	76 46 39.1
Portland station, road crossing at .....	39 05 38.3	76 45 54.6
Admiral station, road crossing at post-office .....	39 05 22.3	76 44 09.9
Odenton crossing of Philadelphia, Baltimore and Washington and Annapolis, Washington and Baltimore railroads.....	39 05 14.5	76 42 23.1

*Geographic positions along the Philadelphia, Baltimore and Washington Railroad between Odenton and Bowie.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Trestle No. 10, road crossing under.....	39 03 55.5	76 43 45.7
Patuxent station, road crossing under trestle.....	39 03 17.9	76 44 11.4
Siding, east track at road crossing .....	39 02 25.9	76 44 43.6
Arundel station, west track 100 feet north of .....	39 01 57.9	76 45 12.7
Road crossing (east track) .....	39 01 03.7	76 45 54.7
Bowie, east edge of road 25 feet north of north end of bridge over Philadelphia, Baltimore and Washington Railroad.....	39 00 29.4	76 46 44.8

*Geographic positions along highways.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Bowie, three corners near stone residence in northwest part of .....	39 00 38.7	76 46 56.0
White house, three corners, 300 feet east of .....	39 00 34.7	76 48 05.9
Three corners, telegraph road, 45 feet south to oak tree, 55 feet northwest to wild cherry tree.....	39 00 25.2	76 48 38.4
Forks of road to west at row of cedars .....	39 00 46.0	76 49 14.8
Three corners, 22 feet south to fence post, 40 feet north to pear tree .....	39 00 56.8	76 50 53.9
Four corners, 40 feet southeast to oak tree, 43 feet southwest to corner of dwelling.....	39 01 10.6	76 51 30.7
Forks of road, 15 feet east to forks of oak, 30 feet northwest to forks of oak .....	39 00 40.7	76 52 45.8
Forks of road to east, 200 feet east of stream.....	39 00 19.9	76 53 41.0
Four corners, 35 feet southeast to pine tree, 18 feet northwest to old stump .....	38 59 46.6	76 54 06.9
Branchville, road crossing.....	38 59 55.5	76 55 14.1
Blacksmith shop, three corners at .....	38 59 54.2	76 55 55.1
Forks, 15 feet south to oak tree, 40 feet northwest to gatepost .....	39 00 08.8	76 57 58.0
Avenel post-office, three corners.....	39 00 15.1	76 58 52.4
Avenel post-office, four corners, 1 mile southwest of, 31 feet northwest to nail in telephone pole, 30 feet to nail in cedar tree .....	38 59 58.6	76 59 44.6
Four corners, 30 feet east to north stone gatepost, 23 feet west to corner of Labyrinth's real-estate office.....	39 01 13.1	77 00 47.1
Burnt Mills post-office, forks of road, 300 feet south of ...	39 01 50.8	77 00 19.2
Junction of W. C. A. pike and Bladensburg road at No. 2 tollgate .....	39 02 26.5	76 59 28.6
Three corners, 15 feet west to oak tree, 40 feet east to mail box .....	39 03 19.0	76 59 44.2
Colesville, four corners .....	39 04 33.9	77 00 07.7
Blacksmith shop, forks of road, 25 feet southeast to telephone pole, 35 feet southwest to telephone pole .....	39 05 21.6	77 00 00.3
Cloverly post-office, three corners, 53 feet west to corner of dwelling, 60 feet south to cherry tree .....	39 06 43.1	76 59 42.8
Stabler triangulation station, U. S. Coast and Geodetic Survey .....	39 07 17.7	76 59 06.5
Browns Corners, forks of road .....	39 07 21.5	76 59 20.4
Ednor, four corners at, 45 feet southwest to corner of post-office, 35 feet north to corner of tollgate No. 3.....	39 08 09.7	76 59 42.3
Three corners at road west, 30 feet east to telephone pole, 35 feet northwest to telephone pole .....	39 08 34.2	77 00 01.5
Ashton, four corners at, 25 feet northwest to large chestnut tree, 55 feet southwest to pump .....	39 08 57.8	77 00 45.7
Brinklow, three corners at, 15 feet west to telephone pole, 45 feet west to maple tree.....	39 09 59.8	77 00 56.7
Three corners, 30 feet northeast to old stump, 25 feet southeast to poplar tree.....	39 10 37.8	77 00 19.3



*Geographic positions along highways—Continued.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Top of hill, forks of road west .....	39 11 34.8	76 59 30.7
Small stream, forks of road .....	39 12 15.1	76 59 01.8
Three corners at chestnut tree .....	39 13 19.0	76 58 29.1
Dayton, four corners at, 45 feet southwest to telephone pole, 27 feet east to large tree opposite Howard's store..	39 14 22.6	76 59 14.0
Dayton, three corners 400 feet west of post-office, 20 feet north to cedar tree, 15 feet east to fence .....	39 14 29.3	76 59 23.3
Glenelg post-office, three corners 650 feet east of, 25 feet north to corner post fence, 35 feet south to corner of picket fence .....	39 15 47.0	76 59 56.5
Glenelg post-office, southeast corner stone, foundation Providence M. E. Church .....	39 15 37.2	77 00 37.1

**Anne Arundel County; Relay quadrangle.**

Starting at Odenton the line follows the Annapolis, Washington and Baltimore Railroad to Annapolis, connecting with dome of state house, United States Coast and Geodetic Survey triangulation station. Positions given on United States standard datum.

*Geographic positions along the Annapolis, Washington and Baltimore Railroad between Odenton and Annapolis.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Sappington, road crossing at .....	39 04 45.5	76 41 09.1
Gambrills station, road crossing at .....	39 04 07.4	76 40 06.0
Millersville station, road crossing at .....	39 03 23.8	76 38 57.2
Waterbury station, road crossing at .....	39 02 51.0	76 37 26.3
Crownsville, road crossing at .....	39 01 33.6	76 36 02.8
Vacant store, road crossing at .....	39 00 55.1	76 34 37.8
Inglehart station, road crossing northwest of .....	39 00 41.3	76 34 02.0
Road crossing .....	39 00 00.8	76 33 15.8
Camp Parole, road crossing .....	38 58 57.1	76 31 59.7
Annapolis, road crossing 250 feet west of tank .....	38 58 45.9	76 30 22.6
Annapolis, junction of Northwest and Washington streets.	38 58 51.1	76 29 48.9
Annapolis state house triangulation station, U. S. Coast and Geodetic Survey .....	38 58 43.49	76 29 28.17

## MICHIGAN.

## PRIMARY TRAVERSE.

Macomb and Oakland counties; Detroit quadrangle.

The following geographic positions were determined from primary traverse in 1903 by J. R. Ellis, topographic aid. The line starts from an adjusted position at Novi and follows east along public highways to Lake St. Clair, thence south to Windmill Point triangulation station. Positions are given on the United States standard datum.

*Geographic positions along highways.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Novi, Pere Marquette Railroad crossing south of village ..	42	28	32.9	83	28	31.3
T. 1 N., R. 8 E., corner secs. 10, 11, 14, 15 .....	42	29	39.6	83	28	34.4
T. 1 N., R. 8 E., corner secs. 11, 12, 13, 14 .....	42	29	45.0	83	27	24.1
T. 1 N., Rs. 8 and 9 E., corner secs. 7, 12, 13, 18 .....	42	29	48.2	83	26	10.4
T. 1 N., R. 9 E., corner secs. 7, 8, 17, 18 .....	42	29	50.4	83	25	02.2
T. 1 N., R. 9 E., corner secs. 8, 9, 16, 17 .....	42	29	52.1	83	23	52.1
T. 1 N., R. 9 E., corner secs. 9, 10, 15, 16 .....	42	29	54.1	83	22	41.7
T. 1 N., R. 9 E., corner secs. 10, 11, 14, 15 .....	42	29	56.1	83	21	31.5
T. 1 N., R. 9 E., corner secs. 11, 12, 13, 14 .....	42	29	57.8	83	20	21.1
T. 1 N., Rs. 9 and 10 E., corner secs. 7, 12, 13, 18 .....	42	29	59.3	83	19	10.6
Crossroads .....	42	30	02.9	83	17	07.2
T. 1 N., R. 10 E., corner secs. 9, 10, 15, 16 .....	42	30	04.4	83	15	43.2
T. 1 N., R. 10 E., corner secs. 10, 11, 14, 15 .....	42	30	06.0	83	14	31.1
T. 1 N., R. 10 E., corner secs. 11, 12, 13, 14 .....	42	30	07.8	83	13	21.4
T. 1 N., Rs. 10 and 11 E., corner secs. 7, 12, 13, 18 .....	42	30	09.4	83	12	11.2
T. 1 N., R. 11 E., corner secs. 7, 8, 17, 18 .....	42	30	10.6	83	11	02.3
Cemetery corners, crossroads at corner secs. 9, 10, 15, 16, T. 1 N., R. 11 E. ....	42	30	14.5	83	08	42.2
T. 1 N., R. 11 E., corner secs. 10, 11, 14, 15 .....	42	30	14.5	83	07	30.4
T. 1 N., R. 11 E., corner secs. 11, 12, 13, 14 .....	42	30	16.0	83	06	21.1
T. 1 N., Rs. 11 and 12 E., corner secs. 7, 12, 13, 18 .....	42	30	17.8	83	05	08.5
T. 1 N., R. 12 E., corner secs. 7, 8, 17, 18 .....	42	30	19.5	83	04	03.3
T. 1 N., R. 12 E., corner secs. 8, 9, 16, 17 .....	42	30	21.1	83	02	47.9
T. 1 N., R. 12 E., corner secs. 9, 10, 15, 16 .....	42	30	22.6	83	01	42.4
T. 1 N., R. 12 E., corner secs. 10, 11, 14, 15 .....	42	30	24.6	83	00	25.1
T. 1 N., R. 12 E., corner secs. 11, 12, 13, 14 .....	42	30	26.7	82	59	14.6
T road north .....	42	30	29.8	82	58	23.7
Grand Trunk Railway, road crossing at .....	42	30	31.6	82	57	38.5
Utica Gravel road, at North and South road .....	42	30	33.7	82	56	10.3
T. 1 N., R. 13 E., corner secs. 9, 10, 15, 16 .....	42	30	35.8	82	54	30.5
T. 1 N., R. 13 E., T road north, near corner secs. 10, 11, 15, 16 .....	42	30	37.7	82	52	49.8
Roseville post-office, crossroads about 3 miles east of .....	42	28	38.4	82	53	21.9

*Geographic positions along highways—Continued.*

Station.	Latitude.			Longitude.		
	°	'	"	°	"	"
Euclid Beach (signboard) road west just north of.....	42	27	54.3	82	53	08.7
Half Way House, T road west at .....	42	26	09.3	82	52	34.3
Jefferson avenue, at road west .....	42	24	25.5	82	53	13.0
Grosse Point post-office, Jefferson avenue T street north at.	42	23	11.0	82	54	05.0
United States Lake Survey triangulation station Windmill Point light-house .....	42	21	29.95	82	55	48.85

**MISSOURI.****PRIMARY TRAVERSE.****St. Louis County; St. Louis quadrangle.**

The following geographic positions were determined from traverse by Mr. George T. Hawkins, topographer, in 1903. The line starts from the United States Coast and Geodetic Survey triangulation station, standpipe in north St. Louis, follows highways through Wellston and Pattonville to the St. Louis, Kansas City and Colorado Railroad, thence to Creve Coeur, thence along Missouri Pacific Railway 4 miles toward St. Louis, thence southward along highways to Barrett, thence along Missouri Pacific Railway through tunnel, thence along St. Louis and San Francisco Railroad across the Meramec River, thence by wagon road to Forder triangulation station, United States Coast and Geodetic Survey.

Positions are given on the United States standard datum.

*Geographic positions along highways.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Standpipe, U. S. Coast and Geodetic Survey .....	38	40	13.6	90	12	30.1
Wellston, crossing St. Charles road and city limits.....	38	40	31.1	90	17	08.0
Eden school ground, road north at southeast corner of ..	38	40	49.9	90	17	43.4
End of car line, road south at.....	38	41	08.2	90	18	18.4
Rosa post-office, road south at .....	38	41	55.1	90	19	41.3
Road south .....	38	42	09.6	90	20	09.2
Road south .....	38	42	21.8	90	20	32.1
Road south .....	38	42	56.0	90	21	35.3
Road south .....	38	43	43.6	90	23	01.7
Road south .....	38	44	04.2	90	23	38.4
Pattonville, four corners.....	38	44	24.5	90	24	13.5
T road south.....	38	45	03.2	90	25	34.8
Road south .....	38	44	36.9	90	26	15.0
Forks of road.....	38	44	08.6	90	27	49.0

*Geographic positions along the St. Louis, Kansas City and Colorado Railroad.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Road crossing north and south .....	38 43 52.9	90 28 34.9
Road crossing north and south .....	38 43 40.4	90 29 10.6
Road crossing .....	38 42 52.6	90 29 40.1
Creve Coeur station .....	38 41 50.9	90 29 55.0

*Geographic positions along the Missouri Pacific Railway.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Schoolhouse, road crossing at .....	38 41 16.6	90 28 34.5
Road crossing over railway north west of station (no name) ..	38 40 37.1	90 28 00.9
Road crossing southeast of station .....	38 39 58.1	90 26 53.2
Missouri Pacific Railway and ballast road, crossing of....	38 39 51.3	90 26 37.7

*Geographic positions along highways.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Crossroads .....	38 39 18.8	90 26 37.9
Crossroads .....	38 38 28.9	90 26 38.5
Pike and ballast roads, crossing of .....	38 37 52.5	90 26 39.0
Road east .....	38 37 05.9	90 26 39.8
Des Peres, Manchester and Ballasts road at .....	38 36 11.9	90 26 40.8
Blacksmith shop, road north at .....	38 36 08.0	90 27 46.2
Crossroads .....	38 35 46.9	90 28 28.7

*Geographic positions along Missouri Pacific and St. Louis and San Francisco railroads.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Tunnel, road crossing near west end of, Missouri Pacific Railway .....	38 33 59.8	90 28 13.4
Valley Park, road crossing south of Frisco station at .....	38 32 56.2	90 29 28.2
Valley Park, road crossing $\frac{1}{2}$ mile south of .....	38 32 29.7	90 29 42.0

*Geographic positions along highways.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Schoolhouse, T road north at.....	38	31	25.1	90	29	11.6
Road south.....	38	31	24.6	90	28	21.8
Fenton, T road one-third mile west of.....	38	30	43.9	90	26	37.0
Fenton, four corners at.....	38	30	47.2	90	26	08.6
Road south.....	38	31	29.1	90	23	46.7
T road east.....	38	31	46.4	90	23	21.5
Sappington, crossroads one-half mile south of.....	38	31	44.7	90	22	47.5
Store, crossroads at.....	38	31	27.4	90	21	26.5
Road south.....	38	31	10.3	90	20	33.0
St. Johns Church, corner of road at.....	38	30	50.9	90	20	13.7
Mehlville, four corners at.....	38	30	21.4	90	19	32.4
Road north.....	38	30	06.9	90	18	26.0
Crossroads.....	38	30	08.2	90	17	51.5
Forder triangulation station, U. S. Coast and Geodetic Survey.....	38	30	39.6	90	17	31.4

**ILLINOIS.****PRIMARY TRAVERSE.****Madison and St. Clair counties; St. Louis quadrangle.**

The following geographic positions were determined from primary traverse for the control of the St. Louis quadrangle by Mr. George T. Hawkins, topographer, in 1903. This line starts from United States Coast and Geodetic Survey triangulation station Sugarloaf, and follows highways northward to Peters, Illinois; thence along Toledo, St. Louis and Western Railroad to East St. Louis; thence along the St. Louis Terminal Railway around East St. Louis to where the Mobile and Ohio Railroad starts south; thence along the St. Louis, Iron Mountain and Southern Railway to a point nearly west from United States Coast and Geodetic Survey triangulation station Dryer; thence along highways to Dryer triangulation station.

A spur leaves this line nearly east of Granite City, Illinois, and runs to the corner of Twenty-first and L streets, Granite City.

Positions are given on the United States standard datum.

*Geographic positions along highways.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Sugarloaf triangulation station, U. S. Coast and Geodetic Survey .....	38 42 05.3	90 00 27.5
Three roads, junction of .....	38 42 23.8	90 00 43.9
Road west .....	38 42 58.4	90 00 38.9
Road east .....	38 43 49.2	90 00 12.8

*Geographic positions along the Toledo, St. Louis and Western Railroad between Peters and Madison.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Peters, crossing of Toledo, St. Louis and Western Railroad at .....	38 44 30.7	90 00 07.4
Road crossing east and west .....	38 44 17.0	90 01 02.4
Road and telephone line crossing .....	38 44 01.6	90 02' 09.6
Stallings, road crossing at .....	38 43 35.2	90 03 34.3
Road crossing north and south .....	38 43 17.1	90 04 32.2
Barco, road crossing at .....	38 43 02.6	90 05 05.5
Horseshoe Lake, road crossing at .....	38 42 45.9	90 05 38.6
Granite City, crossing Toledo, St. Louis and Western Railroad and street-car line 2 miles east of .....	38 42 10.7	90 06 37.7
Road crossing .....	38 41 27.2	90 07 34.9
Madison, road crossing at (Illinois Central station) .....	38 40 31.7	90 08 48.0
Toledo, St. Louis and Western and St. Louis Terminal railroads, crossing of .....	38 39 39.0	90 09 32.2

*Geographic positions along the St. Louis Terminal Railway.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Toledo, St. Louis and Western and St. Louis Terminal railroads crossing, road crossing one-half mile nearly south of .....	38 39 15.4	90 09 25.2
East St. Louis, crossing First street .....	38 38 32.0	90 08 33.6
East St. Louis, crossing Ohio and Mississippi Railway .....	38 38 13.9	90 08 02.8
East St. Louis, street crossing 700 feet east of last .....	38 38 13.0	90 07 54.8
East St. Louis, crossing Louisville and Nashville Railroad .....	38 37 31.6	90 07 48.6
East St. Louis, crossing Rock road .....	38 37 07.4	90 08 02.7
East St. Louis, crossing St. Louis avenue .....	38 36 38.7	90 08 14.0
East St. Louis, crossing Southern Railway .....	38 36 24.4	90 08 33.3

*Geographic positions along the St. Louis, Iron Mountain and Southern Railway.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Large frame house, private road crossing at .....	38 34 51.7	90 09 57.2
Road crossing north and south .....	38 34 22.2	90 10 22.1
Cemetery, north and south road crossing at.....	38 33 54.6	90 10 45.2
Dupo station, north and south road crossing 600 feet northeast of.....	38 32 39.5	90 11 48.4
Road crossing.....	38 31 12.1	90 12 37.7
Road crossing.....	38 30 30.8	90 12 57.2

*Geographic positions along highways.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Schoolhouse, forks of road at.....	38 29 44.2	90 12 39.1
Dryer triangulation station, U. S. Coast and Geodetic Survey .....	38 30 06.3	90 11 54.3

*Geographic positions along highways (spur line).*

Station.	Latitude.	Longitude.
	° ' "	° ' "
T road north.....	38 41 54.3	90 07 18.9
T road west near street-car line .....	38 42 07.5	90 07 19.4
Roads northeast and southwest .....	38 42 07.2	90 07 53.5
Granite City, corner Twenty-first and L streets .....	38 41 56.2	90 08 32.2

**MISSOURI.****PRIMARY TRAVERSE.**

Jefferson, St. Francois, Ste. Genevieve, and Washington counties; Bonneterre and Farmington quadrangles.

The following geographic positions were determined by primary traverse in 1903 by J. R. Ellis, topographic aid. Starting at Sulphur Springs triangulation station of United States Mississippi River Commission; the line follows the St. Louis, Iron Mountain and Southern Railway to Riverside, thence along the Mississippi River and Bonneterre Railway to Silverspring, thence west on wagon road to latitude 38° and longitude 90° 45', thence south through Potosi to Caldonia, thence east on wagon road to Bismarck, thence along St. Louis,

Iron Mountain and Southern Railway to Delassus, thence along public highway to point near southeast corner of quadrangle and north to Bloomsdale, thence west along public highway through French Village to Tunnel station, connecting with original line at this point. A spur line from northeast corner of quadrangle runs northeast, connecting with Magnolia triangulation station of the United States Mississippi River Commission.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Sulphur Springs triangulation station, United States Mississippi River Commission .....	38 19 41.1	90 22 30.4
Bushberg station, St. Louis, Iron Mountain and Southern Railway .....	38 18 12.1	90 22 32.0

*Geographic positions along the Mississippi River and Bonnetterre Railway, between Riverside and Silverspring.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Road crossing, overhead .....	38 13 39.9	90 22 40.1
Festus station, east and west road crossing south of.....	38 13 04.6	90 23 01.2
Road crossing east and west .....	38 12' 13.7	90 23 26.6
Ste. Genevieve station, road crossing 250 feet south west of..	38 10 50.3	90 23 30.3
Road crossing east and west .....	38 08 55.4	90 24 02.2
Plattin station, road crossing 50 feet north of.....	38 07 52.9	90 24 38.6
Road crossing north and south (private).....	38 06 43.8	90 25 38.8
T. 39 N., R. 5 E., quarter corner between secs. 11, 14....	38 06 04.7	90 26 34.3
Trestle, road crossing under .....	38 05 17.7	90 27 43.3
Road crossing northwest and southeast .....	38 04 25.7	90 28 06.6
Milepost 19, road crossing at .....	38 03 21.7	90 28 35.3
Valles Mines, road crossing east and west at.....	38 02 29.3	90 29 51.3
T. 38 N., R. 5 E., corner secs. 5, 6, 7, 8 .....	38 01 42.1	90 30 29.5
Silverspring, road crossing east and west.....	37 59 59.4	90 31 33.8



*Geographic positions along highways.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Crossroads .....	37 59 49.8	90 32 46.6
Corner sections (no number) .....	38 00 06.9	90 33 52.3
T road north, lane south .....	38 00 40.1	90 34 42.5
T road north .....	38 00 42.1	90 35 50.6
T 38 N., R. 4 E., corner secs. 17, 18, 19, and 20 .....	38 00 25.9	90 37 12.6
T road northwest .....	37 59 57.6	90 38 27.0
Road north .....	37 59 43.8	90 39 35.3
Cadet, T road north, about 0.75 mile northeast of .....	37 59 07.0	90 40 54.0
Whites, Iron Mountain Railway at road crossing at .....	37 58 49.7	90 42 16.8
Selby and Mineral Point and Shibbeloth roads, crossing of .....	37 58 05.5	90 43 31.9
Road north and south .....	37 57 57.6	90 44 38.2
Potosi and Old Mines road and 3 notch road north, inter- section of .....	37 57 58.3	90 45 49.1
Potosi and Selby and Potosi and Old Mines roads, cross- ing of .....	37 56 42.8	90 46 04.6
Potosi, South Meridian stone at .....	37 56 12.5	90 47 16.8
Potosi, crossing of Missouri and High streets .....	37 56 11.0	90 47 16.3
Road east .....	37 55 33.4	90 45 59.6
T. 39 N., Rs. 2 and 3 E., corner secs. 19, 30, 25, and 24 ..	37 54 15.7	90 45 29.2
Road southeast .....	37 53 25.6	90 44 16.0
Road northeast and southwest .....	37 52 52.2	90 43 05.4
Potosi and Irondale and Potosi and Hunters Mill roads, crossing of .....	37 52 28.0	90 42 55.1
Caledonia and Irondale road and road southwest, inter- section of .....	37 51 00.7	90 43 53.2
Road east and west .....	37 50 23.3	90 44 56.4
Potosi and Caledonia and Irondale and Caledonia roads, crossing of .....	37 49 05.4	90 46 34.4
T road west .....	37 47 28.6	90 46 41.2
Caledonia, T. road west, 0.25 mile north of .....	37 46 01.6	90 46 22.3
Road northwest .....	37 46 25.3	90 44 44.9
Caledonia and Irondale road and road to Bismarck, inter- section of .....	37 46 50.9	90 42 42.9
Road southwest .....	37 45 51.1	90 41 31.5
Road north .....	37 45 18.9	90 39 44.0
Washington and St. Francois county line, crossroads at ..	37 45 30.1	90 38 38.9

*Geographic positions along the St. Louis, Iron Mountain and Southern Railway between Bismarck and Delassus.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Bismarck station, street crossing 210 feet southeast of....	37 46 05.4	90 37 33.4
T. 35 N., R. 4 E., corner secs. 5, 6, 7, and 8 .....	37 45 50.9	90 37 29.3
Road crossing north and south .....	37 45 35.4	90 36 40.4
Road crossing northwest and southeast (private).....	37 44 33.1	90 35 27.7
Milepost 81, private road crossing northwest and south-east near .....	37 46 04.3	90 33 00.7
Loughboro, road crossing north and south at.....	37 46 37.5	90 31 02.6
Bridge No. 843, road crossing north and south 1,000 feet east of.....	37 46 28.2	90 29 44.9
Doe Run Junction, crossing of Mississippi River and Bonnetterre Railway .....	37 46 19.7	90 29 20.6
Delassus station, road crossing at.....	37 45 43.4	90 27 26.5

*Geographic positions along highways.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Farmington, crossing of Main street and Cosey avenue...	37 46 49.7	90 25 33.8
Farmington, intersection of Ste. Genevieve and St. Marys roads, 1 mile east of .....	37 46 37.2	90 24 08.9
T. 35 N., R. 4 E., quarter corner between secs. 4, 5.....	37 45 59.1	90 23 00.1
T. 35 N., R. 4 E., quarter corner between secs. 3, 4.....	37 45 58.3	90 21 52.8
T. 35 N., R. 4 E., quarter corner between secs. 2, 3.....	37 45 58.9	90 20 45.1
Road north .....	37 45 55.0	90 18 27.5
Y road north .....	37 47 06.1	90 17 49.5
T road south.....	37 48 38.7	90 18 15.0
T road east .....	37 49 35.0	90 18 25.1
T. 36 N., Rs. 6 and 7 E., corner secs. 7, 12, 13, and 18 ...	37 49 56.1	90 18 30.0
Jonca Creek, iron bridge over.....	37 50 36.6	90 17 06.9

*Geographic positions along the Missouri Southern Railroad.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Crossing, Missouri Southern Railroad and Ste. Genevieve wagon road .....	37 51 35.0	90 16 15.9
Crossing, Missouri Southern Railroad and Ste. Genevieve wagon road .....	37 52 33.4	90 13 36.1
Weingarten, road crossing at.....	37 53 15.4	90 12 52.1
Missouri Southern Railroad and Ste. Genevieve wagon road east and west, crossing of .....	37 54 03.2	90 12 48.3

*Geographic positions along highways.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
T road at corner of field .....	37	54	51.7	90	12	55.8
Road northeast and southwest .....	37	56	06.6	90	13	23.1
Establishment Creek, forks of road just east of .....	37	58	59.1	90	12	35.6
Bloomsdale, crossroads at.....	38	00	28.5	90	13	04.7
Y road east.....	38	01	01.9	90	14	20.2
Junction of Goose and Fourche a Du Close creeks (and also Y road northeast).....	37	59	52.4	90	16	27.5
Lawrenceton, intersection of Ste. Genevieve and Crystal City roads one-third mile north of.....	37	58	15.0	90	18	06.9
Intersection of roads at corner of field.....	37	57	53.2	90	19	58.8
Road west near top of hill.....	37	58	07.1	90	20	52.9
T. 38 N., R. 4 E., corner secs. 27, 28, 33, and 34.....	37	58	11.9	90	21	44.4
French Village, intersection of roads at.....	37	58	21.8	90	23	21.5
French Village, Valles Mines road, and St. Louis road, crossing of.....	37	58	33.3	90	24	50.7
Road east.....	37	59	12.0	90	25	42.0
Road northwest.....	37	59	24.6	90	26	52.6
French Village, north and south roads, crossing of.....	38	00	00.8	90	28	36.0
French Village and Vales Mines road, and road west to Tunnel, intersection of.....	38	00	42.9	90	29	18.6
Crossroads.....	38	00	46.2	90	30	13.1

*Spur line from northeast corner of quadrangle to Magnolia triangulation station, United States Mississippi River Commission.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Establishment Creek, T road, southeast at .....	38	02	24.5	90	10	17.1
Magnolia triangulation station, United States Mississippi River Commission.....	38	02	42.5	90	08	38.7

**St. Francois and Ste. Genevieve counties; Farmington quadrangle.**

The following geographic positions were determined by Mr. Sledge Tatum, topographer, in 1904. Line starts from adjusted position 1 mile east of Farmington, determined in 1903, and follows highways north to adjusted position 1.5 miles west of French Village.

*Geographic positions along highways.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Farmington, forks of road 1 mile east of .....	37 46 37.2	90 24 08.9
Farmington, aluminum bench-mark tablet in south front of foundation of court-house, west side of entrance, 2 feet above ground, stamped elevation 917 feet .....	37 46 48.1	90 25 13.9
Road east .....	37 48 16.8	90 25 03.5
Farmington Junction, Missouri Southern Railroad crossing, east and west .....	37 49 53.1	90 25 11.3
Road west .....	37 51 05.9	90 25 19.9
Three Rivers Baptist Church, tablet stamped "Prim. Trav. Sta. No. 35" cemented in solid rock on east side of St. Louis road, 60 feet north of crossroads and 1,200 feet west of church .....	37 51 42.4	90 25 20.6
Road west .....	37 52 34.4	90 25 18.6
Road east .....	37 53 21.2	90 25 08.5
Road west .....	37 54 10.6	90 24 58.8
Doctor Scott's house, road east, 1,000 feet north of .....	37 54 39.8	90 24 54.6
Terre Bleu Creek, center of bridge over .....	37 55 10.8	90 25 02.3
Jaydee post-office, bench-mark tablet stamped "Prim. Trav. Sta. No. 60" cemented in foundation corner of west wall, Chapinan's residence .....	37 55 35.1	90 25 00.0
Road west .....	37 56 10.4	90 24 59.0
Road east to French Village .....	37 57 40.1	90 25 01.4
De Soto road, French Village is east 1.5 miles; De Soto is west 18 miles; St. Louis is north 55 miles .....	37 58 33.3	90 24 50.7

**Washington County; Potosi quadrangle.**

The following geographic positions were determined from primary traverse in 1904 by Mr. Sledge Tatum, topographer. The line starts from a point in Potosi established by Mr. Ellis in 1903, and follows highways west, south, and east along border of quadrangle:

*Geographic positions along highways.*

Stations.	Latitude.	Longitude.
	° ' "	° ' "
Potosi; Missouri and High streets, crossing of .....	37 56 11.0	90 47 16.3
Road south .....	37 56 48.4	90 47 57.6
Road south .....	37 57 25.1	90 48 37.3
Door of Public Hall, road north .....	37 59 17.3	90 50 59.0
T. 38 N., R. 1 E., secs. 35 and 36, quarter corner between .....	37 58 30.3	90 53 08.0
Crossroads .....	37 58 30.0	90 53 51.1
William Smith's house, 140 feet east of, west side of branch, 60 feet west of spring house, cemented in solid rock, bronze tablet stamped "Prim. Trav. Sta. No. 79" .....	37 58 46.4	90 55 02.2
Road north .....	37 59 32.4	90 55 58.0

*Geographic positions along highways—Continued.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Crossroads.....	37	59	52.7	90	56	46.4
Road north.....	38	00	28.1	90	57	31.4
At top of hill, dim crossroad, mark in red paint on tree "U. S. G. S. Sta. 145".....	37	59	39.8	90	59	02.8
Floyd and Undine post-offices, between; on summit of divide cemented in solid rock on north side of road, bronze bench-mark tablet stamped "Prim. Trav. Sta. No. 167".....	37	58	21.7	90	59	32.3
Singer's house, road east at.....	37	57	34.8	90	58	08.4
Floyd post-office, intersection Berryman and Potosi roads, 700 feet west of.....	37	57	13.9	90	57	06.4
Wooden bridge over creek.....	37	56	40.2	90	58	10.7
Church, 800 feet east of, road to Potosi.....	37	55	21.2	90	59	02.9
T road.....	37	55	16.9	90	59	44.8
Sawmill, 300 feet southeast of road west.....	37	53	34.9	90	59	50.5
Road west, on east side of north and south road, cemented in solid rock, bronze bench-mark tablet stamped "Prim. Trav. Sta. No. 297".....	37	52	42.3	90	59	36.4
Dim road east.....	37	51	38.1	90	58	46.9
Potosi and Palmer road east.....	37	51	00.5	90	59	13.6
T road.....	37	50	21.8	90	59	45.7
Road west.....	37	50	18.4	91	00	54.2
Road west.....	37	49	39.4	91	01	23.6
Road west.....	37	48	28.3	91	01	39.0
Crossroads, trees blazed and marked with red paint, ce- mented in solid rock, bronze bench-mark tablet stamped "Prim. Trav. Sta. No. 394".....	37	47	40.7	91	01	14.3
George Dickens's house, T road at.....	37	46	54.5	91	00	53.5
Road west.....	37	46	44.6	91	00	22.5
Road north.....	37	46	44.9	90	58	13.1
Road north.....	37	46	41.1	90	56	32.7
Road south.....	37	46	43.1	90	55	07.8
Sunlight post-office.....	37	46	55.4	90	54	14.3
H. E. Johnson's house, 500 feet south of; 2.5 miles west of Belgrade, on east bank of creek, cemented in solid rock, bronze bench-mark tablet stamped "Prim. Trav. Sta. No. 498".....	37	46	46.5	90	52	38.8
Belgrade post-office.....	37	47	15.9	90	51	01.5
T. 35 N., R. 2 E., secs. 4 and 5, on line between.....	37	46	44.5	90	50	20.7
Crossroads.....	37	46	20.2	90	49	38.8
Caledonia, road south, about 2.5 miles west of.....	37	45	59.2	90	49	02.7
Caledonia, intersection of Main street and Irondale road.....	37	45	50.7	90	46	21.7
Caledonia, in front of Methodist Church, in large sand- stone step, aluminum tablet stamped "923 St. Louis" and "Prim. Trav. Sta. No. 540" (elevation 923.011 feet).....	37	45	48.4	90	46	21.8

## NEW YORK.

## TRIANGULATION STATIONS.

Allegany County; Belfast quadrangle.

Additional control for this quadrangle was obtained by Mr. E. L. McNair, topographer, who located two new stations from Belfast and Davis triangulation stations. Positions are given on the United States standard datum.

## BELFAST, ALLEGANY COUNTY.

Situated in lot 10, in southwest corner of town of Belfast, about 8 miles southwest of Belfast village, 4 miles northwest of Friendship, and about 2 miles east of Black Creek post-office; 8 feet north of road from Black Creek to Transit Bridge.

Station mark: A copper bolt set in granite post 4 feet long by 6 inches square, marked "U. S. G. S. 477 N. Y."

[Latitude 42° 15' 18.33." Longitude 78° 10' 56.92."]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Clarksville.....	4 14 33.4	184 13 56.6	4. 2311051
Learn .....	84 30 43.1	264 20 40.1	4. 3150995
Gordon.....	156 59 41.60	336 57 16.72	4. 1005250
Davis .....	170 14 49.30	350 12 21.46	4. 4706017
Lowe.....	241 51 42.55	62 00 20.24	4. 3003731
Alma.....	328 17 19.3	148 24 10.2	4. 4279013
Ward .....	272 59 18.3	93 11 57.9	4. 4139142

## DAVIS, ALLEGANY COUNTY.

Located in the northern part of Centerville Township, about 2 miles north of Centerville village, on land owned by Milton Davis.

Station mark: A bronze triangulation tablet cemented in solid rock under center of signal.

[Latitude 42° 31' 02.22". Longitude 78° 14' 36.23%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Carpenter .....	176 40 39.24	356 40 09.55	4. 2363363
Felch .....	227 29 55.55	47 38 39.19	4. 3784343
Nunda .....	258 10 54.79	78 25 47.18	4. 4878673
Lowe.....	311 01 42.98	131 12 49.93	4. 4770941
Belfast .....	350 12 21.46	170 14 49.30	4. 4706017
Gordon.....	359 41 47.04	179 41 49.78	4. 2436337

## GORDON, ALLEGANY COUNTY.

Located on a bare knoll in the town of Rushford, about  $2\frac{1}{2}$  miles south of Rushford village. It is 34 feet north of the center of east-west road and 15 feet south of center of stone pile marking site of former house. Land owned by Mrs. Gordon, of Rushford.

Station mark: A marble post 33 by 8 by 8 inches set 31 inches in the ground, in center of top of which is cemented a bronze triangulation tablet.

[Latitude  $42^{\circ} 21' 34.29''$ . Longitude  $77^{\circ} 14' 32.17''$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Davis .....	179 41 49.78	359 41 47.04	4. 2436337
Lowe.....	275 29 45.15	95 40 48.36	4. 3548994
Belfast .....	336 57 16.72	156 59 41.60	4. 1005250

## LOWE, ALLEGANY COUNTY.

Located in the southwest corner of town of Birdsall, about  $3\frac{1}{2}$  miles northeast of Angelica. The hill is mostly cleared, but view to north and northeast is cut off by higher hills. Land owned by S. P. Lowe, of Angelica.

Station mark: A marble post 18 by 6 by 6 inches set 10 inches below surface of ground, in top of which is cemented a bronze triangulation tablet.

Reference mark: A marble post 33 by 8 by 8 inches set 30 inches in the ground, in top of which is cemented a bronze triangulation tablet; the letters R. P. cut in top of post. It stands 2 feet south of fence line and 4 feet south of maple tree. True azimuth from station  $168^{\circ} 06' 30''$ ; distance 94.4 feet.

[Latitude  $42^{\circ} 20' 22.84''$ . Longitude  $78^{\circ} 58' 07.67''$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Belfast .....	62 00 20.24	241 51 42.55	4. 3003731
Gordon.....	95 40 48.36	275 29 45.15	4. 3548994
Davis .....	131 12 49.93	311 01 42.98	4. 4770941

## PRIMARY TRAVERSE.

Erie, Genesee, and Wyoming counties; Attica quadrangle.

The following geographic positions were determined by primary traverse run in 1903 by Mr. E. L. McNair, topographer: The line begins at Attica triangulation station and runs west and south to

Orangeville Center, thence west through Varysburg to Wales Center, thence north through Alden to Murrays Corners and Falkirk triangulation station, thence east through East Pembroke to Willow Bend Inn and Batavia triangulation station, thence south from Willow Bend Inn through Alexander to point of starting. Positions are given on United States standard datum.

*Geographic positions along highways from Orangeville Center to Wales Center.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Orangeville Center, four corners.....	42	45	00.6	78	14	55.5
Orangeville Center, 1.5 miles west of, four corners.....	42	45	21.1	78	16	43.1
Varysburg post-office, in street opposite.....	42	45	41.6	78	18	47.2
Varysburg station, road crossing 150 feet south of.....	42	45	59.7	78	19	10.5
Varysburg station, 1 mile west of, four corners.....	42	46	13.1	78	20	14.3
Varysburg station, 1.5 miles west of, road north.....	42	46	13.6	78	21	09.8
North Sheldon, four corners at.....	42	46	12.8	78	23	20.4
Dorshide's hotel, 1.25 miles east of, four corners.....	42	46	11.6	78	25	08.4
Dorshide's hotel, road north.....	42	46	10.6	78	26	32.5
Iron highway bridge, 400 feet east of, road north.....	42	46	11.0	78	29	09.3
Wales Center, covered bridge, 1.5 miles east of, forks of road.....	42	46	05.0	78	31	19.1

*Geographic positions along highways from Wales Center via Alden to Murrays Corners.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Wales Center, 2.25 miles northeast of, forks of road.....	42	47	25.9	78	29	54.4
Williston, 2.5 miles south of, T road north.....	42	47	25.8	78	30	57.7
Williston, 1.25 miles south of, creek crossing.....	42	48	35.7	78	31	01.4
Williston, T road at.....	42	49	39.0	78	31	00.2
Williston, 1 mile east of, four corners.....	42	49	39.7	78	29	47.7
Alden, 4.25 miles south of, four corners.....	42	50	32.9	78	29	48.3
Iron bridge over Cayuga Creek, T road at west end of....	42	51	27.3	78	30	20.2
Al'en, 1.25 miles south of, road east.....	42	52	42.1	78	29	49.0
Alden station, Erie Railway, road crossing.....	42	53	48.0	78	29	47.5
Alden station, Lackawanna Railway, road crossing.....	42	55	20.7	78	29	39.6
Crittenden station, New York Central Railway, road crossing 250 feet south of.....	42	56	33.8	78	29	15.7
Crittenden station, 1 mile north of, road east.....	42	57	15.3	78	28	42.8
Murrays Corners, 2 miles south of, road west.....	42	58	31.3	78	28	41.8
Murrays Corners, four corners.....	42	59	53.6	78	28	39.9



*Geographic positions along highways from Murrays Corners via East Pembroke east to Willow Bend Inn.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Richville, four corners at .....	42 59 51.1	78 26 07.0
Richville, 1.5 miles east of, four corners.....	42 59 34.8	78 24 22.5
Batavia and Tonawanda Railway crossing, 0.5 mile west of, road south.....	42 59 41.8	78 22 30.8
Batavia and Tonawanda Railway crossing, 0.5 mile east of, road north.....	42 59 48.7	78 21 21.0
East Pembroke, 0.75 mile west of, road north .....	42 59 50.4	78 19 39.7
East Pembroke, road south at.....	42 59 43.7	78 18 36.2
Willow Bend Inn, 0.6 mile west of, road south.....	43 00 03.2	78 15 40.2
Willow Bend Inn, road north at .....	43 00 19.0	78 15 02.3

*Geographic positions along highways from road corner 0.6 mile west of Willow Bend Inn south to Orangeville Center.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
New York Central Railway crossing.....	42 58 57.8	78 15 35.1
Lehigh Valley Railroad crossing, 1 mile south of, four corners.....	42 57 21.2	78 75 25.9
Alexander, 2 miles north of, Lackawanna Railway crossing.....	42 55 47.5	78 15 27.2
Alexander, 0.75 mile north of, road west.....	42 54 38.2	78 14 57.5
Alexander, main four corners at.....	42 54 04.5	78 15 26.0
New York Central Railway, Batavia and Attica branch, crossing about 0.6 mile north of F. W. Stevens's house.....	42 52 31.7	78 15 29.6
Attica, 1 mile east of, forks of road at cheese factory.....	42 51 42.9	78 15 38.1
Cheese factory, 1.75 miles south of, road west.....	42 50 14.6	78 15 09.0
Attica Center, 0.75 mile west of, four corners.....	42 48 55.8	78 14 58.4
Orangeville Center, 3 miles north of, four corners.....	42 47 36.9	78 14 56.1
Orangeville Center, 1.5 miles north of, four corners.....	42 46 17.8	78 14 55.6

#### Erie County; Depew quadrangle.

The following geographic positions were determined by primary traverse run in 1903 by Mr. E. L. McNair, topographer. The line begins at Murrays Corners, about 2 miles south of Falkirk triangulation station, and runs west to Williamsville, thence south to Orchard Park, thence east to Wales Center, and is tied to point located by primary traverse the same season. Positions are given on United States standard datum.

*Geographic positions along highways from Murrays Corners to Williamsville.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Grant Club pole, 0.75 mile west of, road north.....	42 59 48.7	78 31 03.1
Clarence, 1.5 miles east of, four corners.....	42 59 27.8	78 33 07.8
Clarence, 0.5 mile east of, road north.....	42 58 56.0	78 34 38.5
Clarence station, West Shore Railway, crossing about 400 feet west of.....	42 58 53.6	78 35 15.1
Clarence, 1.5 miles northwest of, four corners.....	42 59 17.7	78 36 27.4
Four corners.....	42 59 17.7	78 37 03.2
Four corners.....	42 59 18.9	78 38 50.5
Four corners.....	42 59 20.6	78 39 44.1
Transit road, junction with.....	42 59 21.3	78 41 49.7
Williamsville, 2.25 miles northeast of T road north.....	42 58 39.7	78 43 16.0
Williamsville, road south, 800 feet west of stone bridge...	42 57 44.7	78 44 49.2

*Geographic positions along highways from Williamsville south to Orchard Park.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Williamsville, 1 mile south of, road east.....	42 56 56.7	78 44 41.3
Williamsville, 2.75 miles south of, junction with east and west road.....	42 55 44.6	78 44 39.0
New York Central Railway crossing.....	42 54 14.8	78 45 16.0
Lehigh Valley Railway, 0.75 mile south of, road west....	42 53 07.0	78 45 17.4
Gardenville, 1 mile north of, four corners.....	42 52 06.2	78 45 16.1
Gardenville, four corners at.....	42 51 18.2	78 45 17.8
Gardenville station, Pennsylvania Railroad, 1,800 feet south of, four corners.....	42 50 22.0	78 45 15.6
Ebenezer restaurant, four corners at.....	42 49 48.8	78 45 13.9
T road corners.....	42 48 40.5	78 44 42.8
Websters corners, 1.75 miles north of, road west.....	42 48 14.0	78 45 20.3
Webster, four corners.....	42 46 54.0	78 44 47.0
Orchard Park, four corners, 41 feet southeast of Briggs Bros.' store.....	42 46 02.7	78 44 39.2

*Geographic positions along highways from Orchard Park to Wales Center.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Orchard Park, 1 mile south of, four corners .....	42	45	03.6	78	44	53.4
Orchard Park station, 1.5 miles southeast of, Buffalo, Rochester and Pittsburg Railway crossing .....	42	45	02.8	78	43	51.3
Buffalo, Rochester and Pittsburg Railway crossing, 2.5 miles west of, four corners .....	42	45	10.7	78	40	53.9
Cazanova Creek, center of covered bridge over .....	42	45	14.6	78	39	08.8
Four corners .....	42	45	40.0	78	38	37.9
East Aurora, Main street crossing Pennsylvania Railroad ..	42	46	04.0	78	36	44.6
East Aurora, Main street crossing, 1.75 miles east of, four corners .....	42	46	02.0	78	34	41.2
Forks of road .....	42	46	04.1	78	33	08.9
Wales Center, southeast corner of church .....	42	46	06.8	78	32	02.0
Wales Center, Dr. Wells Faber's monument in church yard .....	42	46	06.5	78	32	03.1

Oneida and Oswego counties; Mexico and Kasoag quadrangles.

The following geographic positions were determined by primary traverse run by Mr. E. L. McNair, topographer. The line starts at Central Square Methodist Church, a position determined by the New York State Survey, and runs westward along New York, Ontario and Western Railway to Pennellville, thence north via highways to Dyke triangulation station on Lake Ontario, thence eastward via highways through Fernwood to South Albion, thence south via West Amboy to Constantia, thence west along New York, Ontario and Western Railway to Central Square.

A second line was started at Constantia, running east along New York, Ontario and Western Railway to Cleveland, thence north and east via highways to Camden, thence north and east via Williamston to South Albion. A line was also run between Williamston and West Amboy, connecting with Amboy triangulation station.

Positions are given on the United States standard datum.

*Geographic positions from Central Square west along New York, Ontario and Western Railway to Pennellville.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Central Square M. E. Church triangulation station .....	43	17	13.5	76	08	45.88
Central Square station, crossroads 600 feet west of .....	43	16	39.9	76	08	42.8
Caughdenoy station .....	43	16	47.8	76	12	34.8
Pennellville, crossroads 0.25 mile east of .....	43	16	54.4	76	15	50.8

*Geographic positions along highway—Pennellville north to Lake Ontario.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Pennellville, crossroads about 2 miles north of.....	43	18	25.3	76	15	06.1
Road east.....	43	20	28.2	76	14	33.4
Mexico, three corners 2 miles north of.....	43	22	00.9	76	14	29.9
Five corners.....	43	23	49.1	76	15	24.9
Road west.....	43	25	18.5	76	15	01.0
Three corners.....	43	36	46.8	76	14	22.6
Mexico station, railway crossing just west of.....	43	28	12.2	76	14	17.5
Three corners.....	43	29	39.8	76	14	39.2
Arthur post-office, five corners.....	43	29	42.4	76	14	55.3
Arthur, five corners 1 mile northeast of.....	43	30	19.3	76	13	56.9

*Geographic positions along highways from Arthur eastward to South Albion.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Arthur, four corners 3.25 miles east of.....	43	29	13.0	76	11	09.2
Fernwood post-office, 0.75 mile southwest of, four corners..	43	29	07.9	76	09	24.2
Fernwood station, railway crossing 250 feet south of.....	43	29	41.1	76	08	41.8
Fernwood, 2.5 miles east of, four corners.....	43	29	05.7	76	05	52.8
Dugway, three corners in front of hotel.....	43	27	40.6	76	04	55.4
Howardville, forks of road.....	43	27	39.8	76	03	41.4
South Albion, four corners.....	43	28	02.0	76	00	46.5

*Geographic positions along highways from South Albion south to Constantia.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
South Albion, 2 miles south of, road west.....	43	26	12.1	76	00	57.4
Three corners.....	43	25	25.1	76	00	13.4
Road east.....	43	24	24.5	75	59	42.2
West Amboy, three corners.....	43	23	04.9	75	59	07.8
Four corners.....	43	22	36.4	75	56	14.6
Four corners.....	43	23	25.3	75	55	38.8
North Constantia, four corners.....	43	20	33.3	75	59	51.3
Four corners.....	43	18	21.5	76	00	49.9
Creek crossing.....	43	17	04.7	75	59	50.8
Constantia station, railroad crossing 350 feet east of.....	43	15	02.6	76	00	03.0

*Geographic positions along New York, Ontario and Western Railway from Constantia to Central Square.*

Station.	Latitude.		Longitude.	
	°	' "	°	' "
Road crossing.....	43	16 02.4	76	02 48.7
West Monroe station.....	43	16 33.4	76	04 07.2
Central Square station, railroad crossing.....	43	16 39.8	76	08 34.4

*Geographic positions along New York, Ontario and Western Railway—Constantia to Cleveland.*

Station.	Latitude.		Longitude.	
	°	' "	°	' "
Road crossing.....	43	14 57.5	75	57 54.3
Bernhards station.....	43	14 46.2	75	55 59.0
Road crossing.....	43	14 21.1	75	53 46.9
Cleveland station.....	43	14 10.8	75	52 53.5

*Geographic positions along highways—Cleveland to Camden.*

Station.	Latitude.		Longitude.	
	°	' "	°	' "
Cleveland station, 0.75 mile north of, road west.....	43	14 45.6	75	52 33.3
Church, four corners at.....	43	16 12.4	75	51 21.3
One mile east of church, three corners.....	43	15 59.6	75	50 20.8
Road east.....	43	17 01.0	75	49 21.5
Road north.....	43	17 28.4	75	46 54.6
Four corners.....	43	17 17.2	75	46 05.3
Four corners.....	43	18 36.6	75	45 26.9
Camden, Rome, Watertown and Ogdensburg Railway crossing.....	43	19 49.5	75	44 56.0

*Geographic positions along highways—Camden to South Albion.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Camden, 2 miles northwest of, four corners .....	43	21	32.3	75	45	28.2
Road west .....	43	23	15.3	75	46	00.7
Forks of road .....	43	24	09.7	75	46	30.4
Road west .....	43	25	28.9	75	47	41.4
Four corners .....	43	25	38.6	75	49	50.5
Four corners .....	43	25	43.1	75	51	56.1
Williamston, 0.75 mile southeast of, three corners .....	43	25	21.8	75	52	17.1
Road north .....	43	26	30.4	75	55	18.3
Forks of road .....	43	27	13.6	75	56	14.8
Road southeast .....	43	27	44.9	75	57	56.1
Four corners .....	43	28	13.2	75	59	28.2

*Geographic positions between Williamston and West Amboy.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Williamston, 1 mile east of, road west .....	43	24	35.5	75	54	42.9
Amboy triangulation station, four corners 0.5 mile west of .....	43	23	25.3	75	55	38.8
Amboy Center, 0.75 mile northeast of, four corners .....	43	22	36.4	75	56	14.6

**St. Lawrence County; Brierhill, Massena, Ogdensburg, and Waddington quadrangles.**

The following geographic positions on United States standard datum were determined by Mr. E. L. McNair, topographer, in May, 1904. The line starts at Ogdensburg light-house, located by triangulation of the United States Lake Survey, follows highways southward to Black Lake; thence along west shore of that lake to latitude  $44^{\circ} 30'$ ; thence northward to Morristown Point triangulation station of the United States Lake Survey. Another line runs from Edwardsville eastward via Depeyster to Dekalb; thence northward via Rensselaer Falls and Woodbridge Corners to Jinks triangulation station of the United States Lake Survey. This line was also connected with Canton water tower, previously located by triangulation.

*Geographic positions along highways.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Ogdensburg light-house, United States Lake Survey $\Delta$ ...	44 41 52.44	75 30 14.71
Ogdensburg, intersection of Pine street and New York avenue .....	44 41 07.3	75 29 39.5
Ogdensburg, 2.25 miles south of, road west, telephone line.	44 39 35.7	75 29 46.2
Ogdensburg, 3.75 miles south of road forks to southeast...	44 38 13.2	75 30 25.8
Galilee M. E. Church, road northeast.....	44 36 37.1	75 30 21.5
Edwardsville, 6 miles northeast of, forks of road at small bridge near red schoolhouse.....	44 34 56.8	75 30 19.3
Edwardsville, 4 miles northeast of, road northwest at little red schoolhouse.....	44 33 45.4	75 32 06.2
Edwardsville, 2.8 miles northeast of, road northwest.....	44 33 09.8	75 33 16.4
Edwardsville, 1.6 miles northeast of, road northwest.....	44 32 27.6	75 34 19.3
Edwardsville, four corners at.....	44 31 20.9	75 35 35.0
Edwardsville, 2.2 miles southwest of, house of Nathan Bush, 36 feet north of northwest corner of, large rock in place, bronze tablet stamped "Prim. Trav. Sta. No. 53" .....	44 30 06.3	75 37 33.3
Brierhill post-office, 2 miles southeast of, at schoolhouse, road northeast .....	44 30 41.8	75 38 41.0
Brierhill station, 0.25 mile south of, crossing Rome, Watertown and Ogdensburg railroad.....	44 31 09.7	75 39 38.7
Brierhill post-office, 800 feet north of, road east.....	44 32 03.9	75 39 46.1
St. Lawrence cheese factory, four corners .....	44 32 27.8	75 41 15.5
St. Lawrence cheese factory, 1.25 miles northeast of, four corners .....	44 33 00.2	75 40 06.0
Morristown station, 0.75 mile south of, forks of road.....	44 34 45.0	75 38 30.7
Morristown station, road crossing at .....	44 35 15.9	75 39 02.2
Morristown Point triangulation station United States Lake Survey, drill hole in ledge of rock; the latter has broken off and fallen partly in the river; apparently 7 feet out of place .....	44 35 55.61	75 38 33.16

*Geographic positions along highways between Edwardsville, via Depeyster, and Dekalb.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
W. H. Mitchell's house, T road corner.....	44 31 45.5	75 34 09.8
Bolton district schoolhouse, road opposite.....	44 31 50.3	75 32 30.4
G. C. Clarke, center of road opposite house .....	44 32 42.3	75 30 31.2
Warren district white school, road north.....	44 32 54.8	75 30 04.1
Kings Corners (Kokomo post-office).....	44 33 38.1	75 27 33.8
Depeyster, four corners.....	44 33 09.1	75 26 08.1
John McNeil's house, road southwest.....	44 32 19.6	75 26 44.8

*Geographic positions along highways between Edwardsville, via Depeyster, and Dekalb—*  
Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Mud Lake, in bowlder 7 feet west of center of road, 101 feet from northwest corner of Thomas Townsend's house, 99 feet from southeast corner of Oliver Perry's house, 260 feet north of road turning east, bronze triangulation tablet stamped "Prim. Trav. Sta. No. 87." ..	44 30 49.8	75 27 51.1
B. H. Hurlburt's house, road north.....	44 31 10.3	75 25 22.3
Depeyestertown, school district No. 3, forks of road at red schoolhouse .....	44 31 34.2	75 24 22.5
Forks of road, road south.....	44 31 15.3	75 23 34.2
Dekalb, 1 mile west of Oswegatchie River bridge at, 600 feet southeast of house of Horace Streeter, 50 feet north of road, in solid rock, bronze triangulation tablet stamped "Prim. Trav. Sta. No. 135" .....	44 30 26.1	75 21 32.7
Dekalb, Oswegatchie River, west end of iron bridge over.	44 30 05.6	75 20 44.2

*Geographic positions along highways.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Rensselaer Falls, 4.6 miles southeast of, George Baxter's house, center of road opposite.....	44 32 01.8	75 16 16.1
Rensselaer Falls, 5.7 miles southeast of, 968 feet north of railroad crossing, 300 feet north of four corners, in solid rock, 7 feet west of center of road, a bronze bench mark tablet stamped "Prim. Trav. Sta. No. 13" .....	44 31 06.2	75 15 43.0

*Geographic positions along the Rome, Watertown and Ogdensburg Railroad.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Road crossing.....	44 31 50.6	75 14 28.1
Milepost 128, road crossing 900 feet northeast of.....	44 33 47.9	75 12 45.9
Grass River, bridge over, first road crossing south of railroad.....	44 35 14.8	75 10 45.2

*Geographic positions along highways between Canton and Woodbridge Corners.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Canton water tower .....	44 35 41.4	75 09 47.3
Canton City Hall, 1.75 miles northwest of, roads west....	44 36 14.8	75 12 12.8
John W. Davis's house, mail box in front of .....	44 36 52.3	75 13 04.6
Woodbridge Corners, F. O. Norton's house, four corners 1.2 miles southeast of.....	44 37 28.2	75 14 05.3



*Geographic positions between Dekalb and Jinks triangulation station of the United States Lake Survey via Rensselaer Falls and Woodbridge Corners.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Coopers Falls, forks of road 200 feet east of white house..	44	31	04.7	75	20	17.9
Isaac Piercy, opposite house of, road south.....	44	31	54.3	75	18	45.1
Rome, Watertown and Ogdensburg Railroad, crossing of.	44	32	21.0	75	17	42.4
Canton and Dekalb schoolhouse district No. 17, four corners at schoolhouse.....	44	32	48.7	75.17	00.8	
Rensselaer Falls, 2.5 miles southeast of, road northeast...	44	33	35.7	75	17	41.5
Rome, Watertown and Ogdensburg Railroad crossing ...	44	34	10.8	75	18	09.5
Rensselaer Falls, four corners .....	44	35	23.0	75	19	13.2
Woodbridge Corners, in flat bowlder 6 feet long, 4 feet wide, 1 foot high, in pasture of F. O. Norton, 85 feet northeast of center of road, 60 feet southeast of stone wall, 305 feet west of west end of Mr. Norton's house, bronze bench mark tablet stamped "Prim. Trav. Sta. No. 219" .....	44	38	02.8	75	15	16.3
Woodbridge Corners, 1 mile west of, road south.....	44	38	11.6	75	16	27.9
Woodbridge Corners, 1.7 miles north west of, T corner....	44	38	44.1	75	16	55.5
Lisbon school district No. 22, T corner at Lawrence school .....	44	39	51.2	75	15	03.2
Lisbon school district No. 26, T corner at Lockwood school.	44	40	58.1	75	16	04.9
Lisbon school district No. 8, four corners at Morey Ridge school.....	44	41	54.8	75	14	23.2
Milepost 107, Ogdensburg and Lake Champlain Railway, road crossing 2,000 feet east of.....	44	43	33.6	75	16	27.3
Veitchs four corners (schoolhouse) .....	44	45	05.2	75	14	14.1
Road northeast.....	44	45	47.9	75	13	31.1
Wells four corners, near George Wagoner's house.....	44	47	02.0	75	14	28.7
Road forks.....	44	48	16.2	75	14	12.8
Big Sucker Brook, center of bridge over.....	44	48	41.2	75	15	14.0
Union Church, four corners at.....	44	48	48.0	75	15	23.5
Four corners.....	44	49	35.3	75	15	56.3
Jinks triangulation station, United States Lake Survey, dressed stone post, top being 1 foot below surface of ground, chiseled cross on bowlder 200 feet to north, chiseled cross on bowlder 178 feet to west.....	44	50	12.27	75	15	54.62

*Geographic positions along highways between Madrid and Massena.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Madrid station, Ogdensburg and Lake Champlain Railway, road crossing 285 feet west of .....	44 44 10.1	75 08 52.8
Madrid, McCall's hotel, four corners, 215 feet south of ...	44 44 54.2	75 07 58.9
Madrid, 0.7 mile northeast of, three corners.....	44 45 20.6	75 07 35.7
Cheese factory, road northwest at .....	44 47 37.8	75 07 11.8
Chamberlains, four corners .....	44 49 39.6	75 06 10.9
Forks of road .....	44 50 09.8	75 06 05.0
Chases Mills, four corners.....	44 50 56.8	75 04 52.1
Road north .....	44 52 11.4	75 03 28.3
Louisville town, school district No. 2, T corner 0.25 mile west of schoolhouse.....	44 54 11.7	75 03 22.6
Louisville, 1 mile northwest of, road southeast .....	44 54 32.4	75 01 45.3
Louisville town, school district No. 4, four corners at schoolhouse .....	44 54 56.2	74 59 55.2
Road southeast.....	44 55 17.6	74 58 16.0
Louisville town, brick schoolhouse No. 5, road northwest at .....	44 55 26.8	74 56 50.6
Road northwest .....	44 56 00.7	74 54 50.7
Massena Springs, corner Main and Phillips streets, in corner of W. H. Hodge's clothing store, bench mark tablet stamped "Elevation 205 feet".....	44 55 58.2	74 53 35.2
Massena station, Rome, Watertown and Ogdensburg Railway, road crossing, 350 feet south of.....	44 54 53.1	74 53 15.9

**NORTH DAKOTA.****PRIMARY TRAVERSE.**

**Ransom, Richland, and Sargent counties; Wyndmere quadrangle.**

The following geographic positions were determined from primary traverse by Mr. Sledge Tatum, topographer, in 1904. The line begins at the crossing of the range line with the "Soo" Railway, 1 mile east of Hankinson; thence runs west along this railway to a point 1 mile west of Lidgerwood; thence south on section line about 0.5 mile to Great Northern Railway; thence west on that railway to Rutland; thence north via Milnor to northwest corner of quadrangle; thence eastward along highways on section lines to Colfax. At the latter place it was tied to a point previously located by primary traverse. A spur line was run from the starting point mentioned above, south and west to Hankinson triangulation station of the United States Coast and Geodetic Survey. The comparative values of the position of the latter being as follows:

Station.	Latitude.	Longitude.
	° ' "	° ' "
Hankinson triangulation station, Coast and Geodetic Survey, United States standard.....	46 02 16.01	96 57 04.83
Hankinson triangulation station from Jamestown, N. Dak., astronomic station via Fargo .....	46 02 18.42	96 56 54.77
Difference .....	2.41	10.06

The following positions are on the Jamestown, N. Dak., astronomic datum, and are consistent with those in the eastern part of the State, previously published:

*Geographic positions along the "Soo" Railway between Hankinson and Lidgerwood.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Hankinson, 1 mile east of; crossing of range line and "Soo" Railway.....	46 04 15.9	96 53 04.6
Hankinson, Main street crossing. ....	46 04 21.2	96 53 57.5
North and south road crossing on section line.....	46 04 42.0	96 59 16.6
North and south road crossing on section line; 12 feet north of track, 16 feet west of center of road; iron bench-mark post stamped "Prim. Trav. Sta. No. 15" .....	46 04 48.6	97 01 46.0
North and south road crossing on section line .....	46 04 52.3	97 04 14.9
Lidgerwood station, 300 feet east of; foot of Main street...	46 04 45.6	97 08 57.1

*Geographic positions along the Great Northern Railroad between Lidgerwood and Rutland.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Lidgerwood, 1.4 miles southwest of; road on section line crossing Great Northern Railroad; 12 feet north of track, 14 feet east of center of road; iron bench-mark post stamped "Prim. Trav. Sta. No. 30" .....	46 04 21.7	97 10 27.9
North and south road on section line; 160 feet west of culvert No. 48.....	46 04 22.5	97 12 57.4
Geneseo station, north and south road, 600 feet west of (quarter section corner).....	46 04 23.7	97 16 39.4
Geneseo, 1 mile west of; north and south road; 12 feet north of track, 16 feet west of center of road; iron bench-mark post stamped "Prim. Trav. Sta. No. 42" .....	46 04 24.1	97 17 54.3
North and south road on section line .....	46 04 30.4	97 20 24.6
Cayuga, Main street on line between Rs. 53-54 .....	46 04 37.6	97 22 53.6
Cayuga, 1 mile west of; 12 feet north of track, 14 feet west of center of north and south road on section line; iron bench-mark post stamped "Prim. Trav. Sta. No. 53"....	46 04 30.5	97 24 08.9
Rutland, 2 miles east of; north and south road on section line .....	46 03 47.8	97 27 46.7
Rutland station, 100 feet west of; Main street on line between Rs. 54-55.....	46 03 20.4	97 30 22.4

*Geographic positions along highways on public-land lines.*

Station.	Latitude.	Longitude.
T. 130 N., Rs. 54-55 W., corner secs. 7, 18, 12, and 13, iron bench-mark post stamped "Prim. Trav. Sta. No. 68," set 30 feet southeast of corner.....	46 04 52.2	97 30 21.9
Perry, 400 feet east of grain elevator "Soo" Railway ....	46 06 19.5	97 30 01.6
Perry, 2 miles east of; north and south road on section line crossing "Soo" Railway .....	46 06 08.8	97 27 53.0
T. 131 N., R. 54 W., corner secs. 28, 29, 32, and 33 .....	46 08 17.1	97 27 53.3
T. 131 N., R. 54 W., corner secs. 16, 17, 8, and 9 .....	46 10 01.0	97 27 53.1
T. 131 N., R. 54 W., corner secs. 4, 5, 8, and 9; iron bench-mark post stamped "Prim. Trav. Sta. No. 88," set 17 feet northeast of this corner.....	46 10 53.4	97 27 54.1
T. 132 N., R. 54 W., corner secs. 16, 17, 20, and 21 .....	46 14 22.4	97 27 54.2
Milnor water tank, road crossing 70 feet west of .....	46 15 32.6	97 27 26.1
Milnor station, bridge on Main street, 0.25 mile north of. Ransom and Sargent county line .....	46 15 51.6	97 27 38.6
T. 132 N., R. 54 W., closing corner secs. 4 and 5 on standard parallel; iron bench-mark post stamped "Prim. Trav. Sta. No. 104," set 30 feet northeast of corner ....	46 16 57.0	97 27 55.3
T. 133 N., R. 54 W., corner secs. 9, 10, 15, and 16 .....	46 20 26.0	97 28 01.8
T. 134 N., R. 54 W., corner secs. 33, 34, 27, and 28 .....	46 23 01.1	97 28 01.6
T. 134 N., R. 54 W., corner secs. 15, 16, 21, and 22 .....	46 24 45.9	97 28 01.2
T. 134 N., R. 54 W., corner secs. 3, 4, 9, and 10 .....	46 26 30.7	97 28 02.6
T. 135 N., R. 54 W., corner secs. 27, 28, 33, and 34 .....	46 28 15.6	97 27 58.0
T. 135 N., R. 54 W., corner secs. 21, 22, 27, and 28; iron bench-mark post stamped "Prim. Trav. Sta. No. 134," set 30 feet southeast of.....	46 29 07.1	97 27 56.2
Venlo grain elevator, 500 feet southeast of; crossing "Soo" Railway on line between secs. 22 and 27, azimuth of railway 312° 56'.....	46 29 06.6	97 27 13.3
T. 135 N., R. 54 W., corner secs. 23, 24, 25, and 26 .....	46 29 06.5	97 25 27.3
T. 135 N., R. 53 W., corner secs. 20, 21, 28, and 29 .....	46 29 04.9	97 21 41.8
T. 135 N., R. 53 W., corner secs. 21, 22, 27, and 28 .....	46 29 05.1	97 20 26.1
T. 134 N., R. 53 W., corner secs. 1, 2, 11, and 12 .....	46 26 27.4	97 17 56.5
T. 134 N., R. 52 W., corner secs. 5, 6, 7, and 8; at cross roads; iron bench-mark post stamped "Prim. Trav. Sta. No. 165".....	46 26 26.0	97 15 27.6
T. 134 N., R. 52 W., corner secs. 3, 4, 9, and 10 .....	46 26 27.1	97 12 56.1
T. 134 N., R. 52 W., north and south road, corner to secs. 1, 2, 11, and 12.....	46 26 27.2	97 10 25.5
T. 135 N., R. 52 W., corner secs. 25, 26, 35, and 36 .....	46 28 11.1	97 10 25.4
T. 135 N., R. 51 W., corner secs. 29, 30, 31, and 32 .....	46 28 11.1	97 07 55.0
T. 135 N., R. 51 W., corner secs. 27, 28, 33, and 34 .....	46 28 11.0	97 05 24.3
T. 135 N., R. 51 W., corner secs. 25, 26, 35, and 36 .....	46 28 11.5	97 02 53.5
T. 135 N., R. 50 W., corner secs. 29, 30, 31, and 32; iron bench-mark post set at northwest corner of sec. 32, stamped "Prim. Trav. Sta. No. 194".....	46 28 11.4	97 00 25.8

*Geographic positions along highways on public-land lines—Continued.*

Stations.	Latitude.	Longitude.
	° ' "	° ' "
T. 135 N., R. 50 W., corner secs. 27, 28, 33, and 34 .....	46 28 11.5	96 57 54.8
T. 135 N., Rs. 49 and 50 W., corner secs. 25, 30, 31, and 36.	46 28 11.5	96 54 08.6
Colfax, in north part of, east and west road crossing Great Northern Railroad .....	46 28 11.8	96 52 27.1

**NORTH DAKOTA—MINNESOTA.****PRIMARY TRAVERSE.**

Cass and Richland counties (N. Dak.) and Clay and Wilkie counties (Minn.); Fargo quadrangle.

The following geographic positions were established from primary traverse in 1902 by Mr. George T. Hawkins, topographer, and are supplementary to those published on pages 141-143, Bulletin No. 216. The line starts from adjusted position at Fargo and follows Northern Pacific Railway to Warren, thence by highways to Kindred, thence along Great Northern Railroad to south border of quadrangle.

*Geographic positions along the Great Northern Railroad between Fargo and Warren.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
T. 139 N., R. 49 W., secs. 10, 11, 14, and 15, east and west road crossing near corner of.....	46 51 37.7	96 50 12.1
T. 139 N., R. 49 W., secs. 15, 16, 21, and 22, east and west road crossing near corner .....	46 50 46.5	96 51 28.9
T. 139 N., R. 49 W., secs. 15, 16, 21, and 22, north and south road crossing near corner .....	46 50 41.8	96 51 35.9
T. 139 N., R. 49 W., quarter corner between secs. 21 and 28, east and west road crossing .....	46 49 55.0	96 52 05.0
Osgood, T. 139 N., R. 49 W., on section line between secs. 28 and 33, road crossing .....	46 49 03.0	96 52 29.5
Tps. 138 and 139 N., R. 49 W., near corner secs. 32, 33, 4, and 5, east and west road crossing .....	46 48 10.6	96 52 53.9
T. 138 N., R. 49 W., on line between secs 8 and 17, east and west road crossing .....	46 46 26.6	96 53 42.6
T. 138 N., R. 49 W., near corner secs. 17, 18, 19, and 2, Horance station, east and west road crossing .....	46 45 34.6	96 54 06.9
T. 138 N., R. 50 W., near quarter corner between secs. 24 and 25, east and west road crossing .....	46 44 43.4	96 56 06.4
T. 138 N., R. 50 W., on line between secs. 25 and 26, north and south road crossing .....	46 44 34.3	96 56 41.2
T. 138 N., R. 50 W., near quarter corner between secs. 26 and 27, north and south road crossing .....	46 44 14.2	96 57 57.9
Warren, north and south road crossing .....	46 43 34.2	97 00 29.6

*Geographic positions along highways.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Tps. 138 and 137 N., R. 50 W., corner secs. 32, 33, 4, and 5, four corners .....	46 42 59.2	97 00 29.2
T. 137 N., R. 50 W., corner secs. 4, 5, 8, and 9, four corners .....	46 42 05.7	97 00 29.5
T. 137 N., R. 50 W., corner secs. 8, 9, 16, and 17, four corners .....	46 41 13.5	97 00 30.0
T. 137 N., R. 50 W., corner secs. 16, 17, 20, and 1, four corners .....	46 40 21.1	97 00 30.1
T. 137 N., R. 50 W., corner secs. 20, 21, 28, and 29, four corners .....	46 39 28.9	97 00 30.1

*Geographic positions along the Great Northern Railroad.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
T. 136 N., R. 50 W., near corner secs. 4, 5, 8, and 9, east and west road crossing .....	46 36 53.4	96 59 28.3
T. 136 N., R. 50 W., near quarter corner between secs. 9 and 16, east and west road crossing .....	46 35 46.0	96 58 33.8
T. 136 N., R. 50 W., near corner secs. 15, 16, 21, and 22, east and west road crossing .....	46 34 42.8	96 57 42.7
East and west road crossing .....	46 34 17.0	96 57 21.7
T. 136 N., R. 50 W., near corner secs. 26, 27, 34, and 35, east and west road crossing .....	46 33 24.9	96 56 39.5
Tps. 135 and 136 N., R. 50 W., quarter corner between secs. 2 and 35, east and west road crossing .....	46 32 32.6	96 55 57.3
T. 135 N., R. 50 W., near corner secs. 1, 2, 11, and 12, east and west road crossing .....	46 30 47.2	96 54 32.3
T. 135 N., R. 50 W., on line between secs. 12 and 13, north and south road crossing .....	46 30 20.6	96 54 10.8
T. 135 N., Rs. 49 and 50 W., quarter corner between secs. 13 and 18, east and west road crossing .....	46 29 56.0	96 53 50.8

This line starts from a point at south border of quadrangle and follows the Great Northern Railroad north, connecting with original position at Fargo.

*Geographic positions along the Great Northern Railroad.*

Station.	Latitude.	Longitude.
MINNESOTA.		
	° ' "	° ' "
T. 135 N., R. 48 W., on line between secs. 9 and 10, north and south road crossing.....	46 31 06.2	96 43 01.8
Tps. 135 and 136 N., R. 48 W., near quarter corner between secs. 4 and 33, east and west road crossing.....	46 32 07.0	96 43 20.5
T. 136 N., R. 48 W., near quarter corner between secs. 28 and 33, east and west road crossing.....	46 33 26.2	96 43 44.8
T. 136 N., R. 48 W., on line between 21 and 28, east and west road crossing.....	46 34 18.4	96 44 00.9
T. 136 N., R. 48 W., near corner secs. 16, 17, 20, and 21, east and west road crossing.....	46 35 10.5	96 44 16.9
T. 136 N., R. 48 W., on line between secs. 8 and 17, east and west road crossing.....	46 36 02.8	96 44 33.1
T. 136 N., R. 48 W., near quarter corner between secs. 5 and 8, east and west road crossing.....	46 36 54.9	96 44 44.9
Tps. 136 and 137 N., R. 48 W., near quarter corner between secs. 5 and 33, east and west road crossing, Clay and Wilkie county line.....	46 37 45.8	96 44 44.8
T. 137 N., R. 48 W., near quarter corner between secs. 28 and 33, east and west road crossing.....	46 38 38.1	96 44 44.7
Comstock station, road crossing 350 feet south of.....	46 39 30.8	96 44 44.6
T. 137 N., R. 48 W., near quarter corner between secs. 16 and 21, east and west road crossing.....	46 40 22.6	96 44 44.5
T. 137 N., R. 48 W., near quarter corner between secs. 9 and 16, east and west road crossing.....	46 41 14.4	96 44 44.5
T. 137 N., R. 48 W., near quarter corner between secs. 4 and 9, east and west road crossing.....	46 42 07.1	96 44 44.4
Tps. 137 and 138 N., R. 48 W., near quarter corner between secs. 4 and 33, east and west road crossing.....	46 42 57.2	96 44 44.3
T. 138 N., R. 48 W., near quarter corner between secs. 28 and 33, east and west road crossing.....	46 43 49.1	96 44 44.3
T. 138 N., R. 48 W., near quarter corner between secs. 21 and 28, east and west road crossing.....	46 44 41.8	96 44 43.7
T. 138 N., R. 48 W., near quarter corner between secs. 16 and 21, east and west road crossing.....	46 45 33.5	96 44 43.1
T. 138 N., R. 48 W., near quarter corner between secs. 9 and 16, east and west road crossing.....	46 46 25.8	96 44 42.5
T. 138 N., R. 48 W., near quarter corner between secs. 4 and 9, east and west road crossing.....	46 47 17.9	96 44 41.9
Tps. 138 and 139 N., R. 48 W., near quarter corner between secs. 4 and 33, east and west road crossing.....	46 48 11.0	96 44 41.2
T. 139 N., R. 48 W., near quarter corner between secs. 28 and 23, east and west road crossing.....	46 49 02.6	96 44 41.7
T. 139 N., R. 48 W., near quarter corner between secs. 21 and 28, east and west road crossing.....	46 49 55.6	96 44 42.2
T. 139 N., R. 48 W., near quarter corner between secs. 16 and 21, east and west road crossing.....	46 50 48.4	96 44 42.6
T. 139 N., R. 48 W., near quarter corner between secs. 9 and 16, east and west road crossing.....	46 51 40.4	96 44 43.1

Cass and Traill counties (N. Dak.) and Norman County (Minn.); Hillsboro quadrangle (North Dakota) and Ada quadrangle (Minnesota-North Dakota).

The following geographic positions in North Dakota and Minnesota were determined from primary traverse by Mr. George T. Hawkins, topographer, in 1903. The line starts from adjusted position at Fargo, N. Dak., and follows the Northern Pacific Railway westward to Wheatland, thence northward along Great Northern Railroad to Portland, thence eastward along wagon road on section lines to Rolette, Minn., and is tied to adjusted position at that place.

Another line starts from Fargo and follows main line of Great Northern Railroad to township line 7 miles north of Hillsboro and is connected with the line along north edge of quadrangle.

*Geographic positions along the Northern Pacific Railway between Fargo and Wheatland.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Road crossing Main street and Northern Pacific Railway.	46 52 25.5	96 47 08.9
Road crossing north and south .....	46 52 37.1	96 50 18.1
Road crossing north and south .....	46 52 42.3	96 51 44.2
Road crossing north and south .....	46 52 46.4	96 52 50.8
T. 139 N., Rs. 49 and 50 W., secs. 1 and 6, quarter corner between .....	46 52 55.3	96 55 18.5
Road crossing north and south .....	46 53 00.4	96 56 43.1
Road crossing north and south .....	46 53 05.0	96 57 59.4
Tps. 139 and 140 N., R. 50 W., corner secs. 4, 5, 32, and 33.	46 53 25.1	97 00 32.0
Road crossing north and south .....	46 53 18.7	97 01 46.3
Tps. 139 and 140 N., Rs. 50 and 51 W., corner of.....	46 53 24.6	97 03 02.5
Green, road crossing at .....	46 53 34.0	97 06 05.5
Tps. 139 and 140 N., R. 51 W., corner secs. 3, 4, 33, and 34	46 53 24.8	97 06 51.1
Road crossing north and south .....	46 53 41.2	97 08 07.7
T. 140 N., Rs. 51 and 52 W., quarter corner between secs. 31 and 36 .....	46 53 49.9	97 10 36.3
Casselton station, road crossing east of.....	46 53 56.7	97 12 33.4
Casselton, crossing Northern Pacific and Great Northern railroads at .....	46 53 58.8	97 13 09.3
Road crossing north and south .....	46 54 03.2	97 14 24.7
Road crossing north and south .....	46 54 07.6	97 15 40.9
T. 140 N., Rs. 52 and 53 W., corner secs. 25, 30, 31, and 36.	46 54 14.6	97 18 03.7
Road crossing north and south .....	46 54 20.2	97 19 19.9
T. 140 N., R. 53 W., corner secs. 22, 23, 26, and 27 .....	46 55 06.3	97 20 35.5
T. 140 N., R. 53 W., corner secs. 14, 15, 22, and 23 .....	46 55 58.5	97 20 35.2



*Geographic positions along the Great Northern Railroad between Wheatland and Portland.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Road crossing north and south .....	46	57	25.6	97	21	52.4
Tps. 140 and 141 N., R. 53 W., corner secs. 4, 5, 32, and 33..	46	58	37.0	97	23	10.0
Road crossing east and west .....	46	59	29.3	97	23	10.5
Road crossing east and west .....	47	00	21.2	97	23	10.2
T. 141 N., R. 53 W., corner secs. 16, 17, 20, and 21 .....	47	01	13.2	97	23	09.9
Road crossing east and west .....	47	02	05.8	97	23	09.6
T. 141 N., R. 53 W., corner secs. 4, 5, 8, and 9 .....	47	02	57.5	97	23	09.8
Tps. 141 and 142 N., R. 53 W., corner secs. 4, 5, 32, and 33..	47	03	49.5	97	23	08.9
Road crossing east and west .....	47	04	41.7	97	22	58.4
Road crossing east and west .....	47	05	33.9	97	23	05.2
Erie, crossing 400 feet south of station .....	47	06	51.9	97	23	15.5
Erie, sec. corner 0.5 mile north of .....	47	07	18.1	97	23	06.7
Road crossing east and west on township line .....	47	09	03.6	97	23	28.3
Road crossing east and west .....	47	09	56.0	97	23	49.1
Road crossing east and west .....	47	10	48.2	97	24	10.1
T. 143 N., R. 53 W., corner secs. 15, 16, 20, and 21 .....	47	11	40.5	97	24	25.1
T. 143 N., R. 53 W., corner secs. 8, 9, 16, and 17 .....	47	12	32.3	97	24	25.3
T. 143 N., R. 53 W., corner secs. 4, 5, 8, and 9 .....	47	13	24.9	97	24	25.6
Tps. 143 and 144 N., R. 53 W., corner secs. 4, 5, 32, and 33.	47	14	17.1	97	24	25.9
T. 144 N., R. 53 W., corner secs. 28, 29, 32, and 33 .....	47	15	09.2	97	24	26.2
T. 144 N., R. 53 W., corner secs. 16, 17, 20, and 21 .....	47	16	53.6	97	24	26.8
T. 144 N., R. 53 W., corner secs. 8, 9, 16, and 17 .....	47	17	45.6	97	24	27.1
T. 144 N., R. 53 W., corner secs. 4, 5, 8, and 9 .....	47	18	37.9	97	24	27.4
Tps. 144 and 145 N., R. 53 W., corner secs. 4, 5, 32, and 33.	47	19	24.6	97	24	27.7
T. 145 N., R. 53 W., corner secs. 32, 33, 28, and 29 .....	47	20	16.8	97	24	28.0
Clifford, road crossing south of station .....	47	20	49.8	97	24	28.2
T. 145 N., R. 53 W., corner secs. 20, 21, 28, and 29 .....	47	21	08.8	97	24	28.3
T. 145 N., R. 53 W., corner secs. 20, 21, 16, and 17 .....	47	22	00.9	97	24	28.5
T. 145 N., R. 53 W., corner secs. 8, 9, 16, and 17 .....	47	22	53.2	97	24	30.2
Road crossing east and west .....	47	23	45.4	97	24	17.4
Road crossing east and west on township line .....	47	24	37.8	97	23	58.1
Road crossing east and west .....	47	25	29.9	97	23	38.9
T. 146 N., R. 53 W., corner secs. 22, 23, 26, and 27 .....	47	26	22.3	97	23	12.5
Road crossing east and west .....	47	28	06.0	97	22	41.0
Road crossing east and west .....	47	28	58.0	97	22	21.7
Tps. 146 and 147 N., R. 53 W., corner secs. 1, 2, 35, and 36.	47	29	51.7	97	21	55.6
Tps. 146 and 147 N., R. 53 W., corner secs. ....	47	29	51.6	97	20	38.6
Mayville, road crossing north of station .....	47	29	59.2	97	19	20.1

*Geographic positions along section-line roads between Mayville, N. Dak., and Rolette, Minn.*

Station.	Latitude.	Longitude.
NORTH DAKOTA.		
	° ' "	° ' "
Tps. 146 and 147 N., R. 52 W., corner secs. 3, 4, 33, and 34.	47 29 50.2	97 16 51.2
Tps. 146 and 147 N., R. 52 W., corner secs. 2, 3, 34, and 35.	47 29 49.5	97 15 34.7
Tps. 146 and 147 N., Rs. 52 and 51 W., corner of.....	47 29 49.2	97 13 01.1
Tps. 146 and 147 N., R. 51 W., corner secs. 4, 5, 32, and 33.	47 29 49.3	97 10 31.1
Tps. 146 and 147 N., R. 51 W., corner secs. 2, 3, 34, and 35.	47 29 49.1	97 07 57.0
Tps. 146 and 147 N., R. 51 W., corner secs. 1, 2, 35, and 36.	47 29 49.5	97 06 40.2
Tps. 146 and 147 N., Rs. 50 and 51 W., corner of.....	47 29 49.8	97 05 23.2
Road crossing line between Ts. 146 and 147 and Great Northern Railroad.....	47 29 50.0	97 04 31.9
Tps. 146 and 147 N., R. 50 W., corner secs. 5, 6, 31, and 32.	47 29 50.0	97 04 03.6
Tps. 146 and 147 N., R. 50 W., corner secs. 4, 5, 32, and 33.	47 29 50.2	97 02 46.5
Tps. 146 and 147 N., R. 50 W., corner secs. 3, 4, 33, and 34.	47 29 50.1	97 01 29.1
Tps. 146 and 147 N., R. 50 W., corner secs. 2, 3, 34, and 35.	47 29 49.7	97 00 12.1
Tps. 146 and 147 N., R. 50 W., corner secs. 1, 2, 35, and 36.	47 29 49.3	96 58 55.0
Tps. 146 and 147 N., Rs. 49 and 50 W., corner of.....	47 29 49.5	96 57 38.6
Tps. 146 and 147 N., R. 49 W., corner secs. 5, 6, 31, and 32.	47 29 49.4	96 56 21.2
Tps. 146 and 147 N., R. 49 W., corner secs. 4, 5, 32, and 33.	47 29 49.4	96 55 03.8
Tps. 146 and 147 N., R. 49 W., corner secs. 3, 4, 33, and 34.	47 29 49.3	96 53 46.8
Tps. 146 and 147 N., R. 49 W., corner secs. 2, 3, 34, and 35.	47 29 49.2	96 52 30.0
T. 146 N., R. 49 W., corner secs. 2, 3, 11, and 12.....	47 28 58.2	96 52 29.7
T. 146 N., R. 49 W., corner secs. 11, 12, 13, and 14.....	47 28 05.7	96 52 30.4
Red River, west end of bridge over.....	47 27 36.5	96 51 05.5
MINNESOTA.		
T. 146 N., R. 48 W., corner secs. 16, 17, 20, and 21.....	47 27 17.2	96 47 28.4
T. 146 N., R. 48 W., corner secs. 15, 16, 21, and 22.....	47 27 17.1	96 46 11.8
T. 146 N., R. 48 W., corner secs. 14, 15, 22, and 23.....	47 27 17.2	96 44 53.8
T. 146 N., R. 48 W., corner secs. 13, 14, 23, and 24.....	47 27 17.3	96 43 36.6
T. 146 N., Rs. 47 and 48 W., corner secs. 13, 18, 19, and 24.	47 27 17.4	96 42 21.8
T. 146 N., R. 47 W., corner secs. 17, 18, 19, and 20.....	47 27 17.3	96 41 04.2
T. 146 N., R. 47 W., corner secs. 16, 17, 20, and 21.....	47 27 17.2	96 39 51.2
T. 146 N., R. 47 W., corner secs. 14, 15, 22, and 23.....	47 27 18.1	96 37 14.1
T. 146 N., R. 47 W., corner secs. 17, 18, 19, and 20.....	47 27 18.5	96 33 21.8

*Geographic positions along the Great Northern Railroad, between Fargo and a point 7 miles north of Hillsboro.*

Station.	Latitude.	Longitude.
NORTH DAKOTA.		
	° ' "	° ' "
Fargo, section corner 2.33 miles northwest of.....	46 53 21.6	96 49 03.4
Road crossing east and west.....	46 55 59.0	96 50 43.2
Tps. 140 and 141 N., R. 49 W., corner secs. 4, 5, 32, and 33.....	46 58 33.9	96 52 38.8
T. 141 N., R. 49 W., corner secs. 20, 21, 28, and 29.....	47 00 18.6	96 53 55.7
Road crossing east and west.....	47 01 11.1	96 54 30.1
T. 141 N., R. 49 W., corner secs. 7, 8, 17, and 18.....	47 02 10.1	96 55 12.3
Road crossing east and west.....	47 02 56.1	96 55 46.5
Road crossing east and west on township line.....	47 03 49.5	96 56 11.3
T. 141 N., R. 49 W., corner secs. 25, 30, 31, and 36.....	47 04 41.7	96 56 26.2
Road crossing east and west.....	47 05 33.8	96 56 49.6
Road crossing east and west.....	47 06 26.3	96 57 08.9
Road crossing east and west.....	47 07 18.3	96 57 28.1
T. 142 N., R. 50 W., corner secs. 1, 2, 11, and 12.....	47 08 10.5	96 57 40.9
Gardner, road crossing east and west at south end of siding at.....	47 08 36.9	96 57 57.0
Road crossing east and west.....	47 09 54.8	96 58 25.8
Road crossing east and west.....	47 10 46.8	96 58 45.0
T. 143 N., R. 50 W., corner secs. 14, 15, 22, and 23.....	47 11 39.7	96 58 58.4
Road crossing east and west.....	47 12 31.4	96 59 23.6
Road crossing east and west.....	47 13 23.6	96 59 42.9
Grandin, road crossing at.....	47 14 08.6	96 59 59.5
T. 144 N., R. 50 W., corner secs. 27, 28, 33, and 34.....	47 14 51.1	97 00 12.2
Road crossing east and west.....	47 16 01.0	97 00 41.1
Road crossing east and west.....	47 16 52.8	97 01 00.3
Road crossing east and west.....	47 17 45.0	97 01 19.7
T. 144 N., R. 50 W., corner secs. 4, 5, 8, and 9.....	47 18 37.5	97 01 37.0
Road crossing east and west on township line.....	47 19 23.1	97 01 56.0
Road crossing east and west.....	47 20 15.4	97 02 15.4
Road crossing east and west.....	47 21 07.1	97 02 34.6
T. 145 N., R. 50 W., corner secs. 16, 17, 20, and 21.....	47 21 59.3	97 02 49.4
Road crossing east and west.....	47 22 51.9	97 03 13.6
Road crossing east and west.....	47 23 44.1	97 03 25.9
Hillsboro, crossing (road) at station.....	47 24 09.2	97 03 30.4
Goose River, road crossing 0.25 mile north of.....	47 25 02.2	97 03 40.0
Road crossing east and west.....	47 26 20.4	97 03 54.1
T. 146 N., R. 50 W., corner secs. 17, 18, 19, and 20.....	47 27 12.6	97 04 05.9
Road crossing east and west.....	47 28 04.9	97 04 13.0
Road crossing east and west.....	47 28 57.1	97 04 22.4

OHIO.

PRIMARY TRAVERSE.

Ashtabula County; Andover and Jefferson quadrangles.

The following geographic positions were determined by primary traverse run by Mr. C. B. Kendall, field assistant, during the summer of 1903. The line begins at Andover triangulation station of the United States Lake Survey, near Andover, and runs northwesterly along Lake Shore and Michigan Southern Railway to Jefferson, thence west via highways to the eighty-first meridian, thence south to parallel  $41^{\circ} 30'$ , thence east to milepost 33 on Ohio-Pennsylvania State line. A line was run south from Jefferson along meridian  $80^{\circ} 45'$  to parallel  $41^{\circ} 30'$ , and another east from Jefferson to milepost 15 on Ohio-Pennsylvania State line. A tie was also made to United States Lake Survey stations—Thompson, in northeastern Geauga County, and Mesopotamia, in northwestern Trumbull County. Positions are given on the United States standard datum.

*Geographic positions along Lake Shore and Michigan Southern Railway between Leon and Jefferson.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Leon, road crossing 1,000 feet north of.....	41 39 24.2	80 36 59.0
Dorset station, low grade line crossing.....	41 41 29.7	80 40 31.1
Jefferson station, 300 feet south of center of east siding at street crossing.....	41 44 17.3	80 45 41.2
Road crossing.....	41 42 40.8	80 42 47.4

*Geographic positions along highways from Jefferson west to the eighty-first meridian.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Jefferson, 2.5 miles west of; three corners.....	41 45 08.4	80 47 57.6
Austinburg, four corners at.....	41 46 18.3	80 51 17.4
Austinburg, 2.5 miles west of; four corners.....	41 46 01.9	80 53 59.9
Forks of road, road northeast.....	41 45 46.3	80 55 17.5
Harpersfield Center, four corners at.....	41 45 33.2	80 56 47.8
Residence of J. H. and L. D. Fowler, four corners at....	41 45 33.2	81 00 10.2

*Geographic positions along eighty-first meridian between parallels 41° 45' and 41° 30'.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Three corners.....	41	44	33.6	80	59	47.2
Mill Creek, center of bridge over.....	41	42	45.4	80	59	32.0
Four corners.....	41	41	54.7	80	59	35.6
Special school district No. 2, four corners at.....	41	41	24.4	81	00	58.8
Four corners.....	41	40	41.3	81	00	58.6
Folley's four corners.....	41	39	57.7	81	00	59.0
Catholic Church, three corners just south of.....	41	38	30.4	81	00	59.4
Trumbull Creek, center of iron highway bridge.....	41	38	08.2	81	00	09.9
Hartsgrove school district No. 4, three corners.....	41	37	58.7	80	59	32.4
Four corners.....	41	37	08.7	80	59	32.3
Four corners at signpost "Hartsgrove 2 miles".....	41	36	19.8	80	59	32.3
Schoolhouse district No. 7, four corners at.....	41	36	30.7	80	59	32.3
Three corners, south edge of east and west road.....	41	33	50.3	80	59	30.3
Stoneville, 0.25 mile west of; four corners.....	41	33	14.2	80	57	47.1
Windsor Mills, three corners at top of hill near church.....	41	32	06.7	80	57	44.7
Windsor Mills, south end of covered highway bridge over Phelps Creek.....	41	31	58.3	80	57	50.8
Three corners, forks to east.....	41	31	22.7	80	57	54.7
Iona post-office, four corners at.....	41	30	30.7	80	58	22.6

*Geographic positions between Iona and Mesopotamia triangulation station.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
County line, four corners at.....	41	30	31.1	81	00	11.4
Three corners, forks to west.....	41	28	44.9	81	00	11.9
Four corners, center road of Middlefield Township.....	41	27	31.3	81	00	12.4
Mesopotamia triangulation station.....	41	26	59.75	80	59	53.15

*Geographic positions along parallel 41° 30' between meridian 81° and milepost 33 on Ohio-Pennsylvania State line.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Four corners.....	41	30	30.2	80	56	21.1
Forks of road to northwest.....	41	30	30.0	80	55	16.6
Grand River, center of covered bridge over.....	41	30	18.1	80	54	28.0
Four corners.....	41	29	20.6	80	53	49.4
Schoolhouse, four corners at.....	41	29	20.3	80	52	46.3
Four corners on State road.....	41	29	20.5	80	52	05.7
Orwell, 1 mile south of, four corners.....	41	31	16.1	80	52	04.6

*Geographic positions along parallel 41° 30' between meridian 81° and milepost 33 on Ohio-Pennsylvania State line—Continued.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Pennsylvania Railroad crossing .....	41	31	16.0	80	50	53.3
Three corners, road to north .....	41	31	16.2	80	49	47.1
Three corners .....	41	31	20.0	80	48	36.8
Three corners .....	41	31	19.6	80	47	26.6
Three corners .....	41	30	52.0	80	46	42.8
Schoolhouse, three corners at <sup>a</sup> .....	41	30	51.9	80	45	17.6
Wade schoolhouse, 0.75 mile west of, three corners, fork to south .....	41	30	54.4	80	44	12.2
Wade schoolhouse, 0.75 mile south of, three corners .....	41	30	23.0	80	43	22.3
Four corners .....	41	30	22.7	80	41	06.7
Three corners .....	41	30	38.2	80	39	58.6
White schoolhouse, three corners at .....	41	30	31.3	80	38	52.1
Four corners .....	41	30	35.4	80	37	22.4
Stanhope creamery, 0.6 mile north of, three corners .....	41	30	24.2	80	36	20.3
Stanhope creamery, three corners at Pennsylvania Railroad crossing .....	41	29	54.1	80	36	17.1
Pennsylvania Railroad crossing, 0.5 mile east of, four corners .....	41	29	54.3	80	35	50.2
Four corners .....	41	29	55.5	80	34	12.8
Stratton Creek, center of bridge over .....	41	29	56.0	80	33	28.0
Cornelian, four corners at .....	41	29	34.9	80	31	50.7
Ohio-Pennsylvania State line, milepost 33 .....	41	29	34.0	80	31	09.6

<sup>a</sup> Reference marks: Eight feet east to fence line; 168 feet northwest to southeast corner of schoolhouse; 55 feet southwest to nail in root of maple tree.

*Geographic positions along highways from Jefferson south to parallel 41° 30'.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Jefferson station, 0.6 mile south of, fork of road to southeast .....	41	43	53.0	80	45	51.7
Lenox, 1 mile north of, four corners .....	41	41	40.7	80	45	42.2
Lenox, four corners at .....	41	40	47.8	80	45	41.3
Township line, New Lyme and Lenox, four corners at .....	41	38	35.4	80	45	39.1
Three corners, road east .....	41	37	27.3	80	45	47.1
Four corners .....	41	36	17.8	80	45	46.9
Four corners .....	41	35	44.0	80	46	49.2
South New Lyme, four corners near hotel .....	41	34	56.1	80	46	35.8
Four corners .....	41	33	26.7	80	46	12.8
Colebrook, four corners at .....	41	32	08.8	80	45	45.4

*Geographic positions along highways from Jefferson east to milepost 15 on Ohio-Pennsylvania State line.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Jefferson, Lake Shore and Michigan Southern Railway, 1.37 miles east of, forks of road to southeast.....	41	44	17.4	80	44	04.3
Forks of road .....	41	45	06.5	80	43	34.8
Lake Shore and Michigan Southern Railway low-grade line, crossing.....	41	45	03.8	80	42	18.8
Four corners .....	41	45	04.5	80	41	07.8
Giddings post-office, four corners at.....	41	45	05.4	80	40	04.0
Gould post-office, three corners at church just north of..	41	45	07.4	80	37	22.0
Creek, center of bridge over.....	41	45	03.9	80	36	05.7
Pierpont, three corners at soldiers' monument.....	41	45	08.4	80	34	13.4
Pierpont, 1.75 miles west of, four corners.....	41	45	09.4	80	32	05.5
Milepost 15, Ohio-Pennsylvania State line, three corners near.....	41	45	09.7	80	31	10.3
Milepost 15 .....	41	45	12.9	80	31	10.0

**Medina and Summit counties; Akron and Medina quadrangles.**

The following geographic positions were obtained from primary traverse in 1904 by Mr. C. B. Kendall, field assistant. The line starts from adjusted traverse position at Lodi, follows highways northward to Grafton triangulation station of the United States Lake Survey, thence east to Hudson, and is tied to Western Reserve Observatory at that place.

*Geographic positions along highways.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Lodi, junction of main line Baltimore and Ohio Railroad with branch from the south, point is 75 feet west of tool house .....	41	01	39.3	82	01	04.6
Lodi, in stone step at northeast corner Taylor Inn, bronze tablet stamped "Prim. Trav. Sta. No. 4" .....	41	02	00.3	82	00	45.8
North and south road at fork to southwest, west edge of, 30 feet southeast to telegraph pole, 40 feet west to telegraph pole .....	41	04	00.6	82	01	29.8
Three corners, road to east, west edge north and south road at, 30 feet to William Gusinger's mail box, 40 feet southeast to corner front yard .....	41	04	37.2	82	01	29.2
Chatham Center, in northeast corner of end of Academy Hall, bronze tablet stamped "Prim. Trav. Sta. No. 23A" .....	41	06	06.2	82	01	29.0
Chatham Center, four corners 1 mile north of, 40 feet northwest to sign post, 40 feet southeast to mail box...	41	06	44.6	82	01	27.8
Litchfield, road crossing 300 feet west of Northern Ohio Railway station .....	41	09	29.9	82	01	24.2

*Geographic positions along highways—Continued.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Litchfield, stone in center of park, said to be center of township .....	41 10 04.0	82 01 23.3
Medina and Lorain county line, three corners road to east.	41 11 55.8	82 01 25.8
Schoolhouse, four corners, at 40 feet northeast to corner of school-yard fence, 35 feet southeast to telephone pole.	41 12 26.7	82 01 25.8
Grafton $\Delta$ station, 0.5 mile southeast of, crossing Cleveland, Lorain and Wheeling Railway, near four corners.....	41 12 25.9	81 59 02.2
Grafton triangulation station, U. S. Lake Survey.....	41 12 44.0	81 59 37.0
Grafton, four corners 1 mile northwest of, 31 feet northeast to nail in mail-box post, 34 feet west to nail in telegraph pole .....	41 13 20.0	82 00 13.2
Four corners, 45 feet southeast to corner hedge fence, 50 feet northwest to corner fence post marked with brass tacks.....	41 14 13.8	82 00 11.8
Lorain and Medina counties, three corners, road to north between .....	41 14 14.6	81 57 29.4
Liverpool, in north wall Lutheran church, 1 foot left of entrance, bronze tablet stamped "Prim. Trav. Sta. No. 62A" .....	41 14 13.8	81 55 38.3
Liverpool, road crossing 200 feet south of station of Cleveland, Lorain and Wheeling Railway .....	41 14 14.5	81 54 29.9
Four corners, 45 feet southeast to telegraph pole, 40 feet northwest to signboard .....	41 14 15.2	81 52 42.4
Three corners, road to north, 35 feet northwest to maple tree, 40 feet northeast to maple tree .....	41 14 17.0	81 49 25.8
Four corners, township line between Hinckley and Brunswick townships, 25 feet northeast to pump, 20 feet southeast to elm tree .....	41 14 17.5	81 47 06.6
Four corners, 40 feet northwest to fence corner, 40 feet northeast to maple tree near corner of house .....	41 14 17.9	81 45 52.7
Hinckley, four corners, 400 feet west of, in north end of west abutment of iron bridge, bronze tablet stamped "Prim. Trav. Sta. No. 87" .....	41 14 18.4	81 44 47.6
Three corners road to south, 45 feet west of bridge.....	41 14 22.2	81 43 43.1
Four corners, 20 feet south to signpost, reads "Hinckley, 2 miles; Richfield, 3 miles; Ragatton, 5 miles; Granger, 5 miles" .....	41 14 22.8	81 42 10.6
West Richfield, aluminum tablet, stamped "Prim. Trav. Sta. No. 106A." Elevation "1,279 Cleveland," in south wall at southeast corner at stone foundation to the Carter House.....	41 14 24.0	81 39 20.1
Richfield, four corners at, 50 feet northeast to cedar tree painted 1148, 35 feet southeast to corner of store .....	41 14 23.4	81 38 17.3
Furnace Run, east end of bridge, 5 feet north of T. B. M., a chiseled cross and square painted T. B. M. 913.....	41 14 25.4	81 36 51.2
Three corners, road to south at fork to left, 60 feet northwest to telegraph pole, 40 feet southwest to large rock..	41 14 44.1	81 35 27.1
Peninsular, four corners at, 8 feet south to Soldiers' Monument.....	41 14 29.3	81 33 19.2



*Geographic positions along highways—Continued.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Peninsular, aluminum tablet, stamped "Prim. Trav. Sta. No. 138A," elevation 711, Cleveland, in north wall at northwest corner of town hall.....	41 14 27.8	81 32 53.4
Three corners, second class road to south, 25 feet southeast to mail box, 35 feet southwest to corner fence post.	41 14 07.9	81 31 39.4
Chittenden station, crossing A. B. & C. Electric Railroad at .....	41 13 56.6	81 29 38.5
Hudson, center of Western Reserve Academy Observatory .....	41 14 37.6	81 26 14.9

**Cuyahoga, Geauga, and Lake counties; Mentor and Painesville quadrangles.**

The following geographic positions were determined by Mr. C. B. Kendall, field assistant, in June, 1904. The line starts at Warrensville triangulation station, United States Lake Survey, follows highways eastward via Chester and Claridon triangulation stations, and is tied to a point 1 mile west of Iona, located by primary traverse in 1903. Another line was run northward along the meridian of 81° 15' and connected with Painesville church spire, located by the United States Lake Survey. Positions are given on the United States standard datum.

*Geographic positions along highways.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Warrensville triangulation station, U. S. Lake Survey....	41 28 39.01	81 30 11.96
North Woodland, four corners .....	41 29 10.1	81 29 52.3
Three corners, road to north, 20 feet north to telephone pole, 25 feet south to high fence .....	41 29 31.0	81 28 36.9
Orauga Hill Church, four corners, 35 feet northwest to telephone pole .....	41 29 30.1	81 26 18.2
Mayfield, street-car station on State road, 35 feet south to center of car track, 40 feet south to northwest corner of street-car station .....	41 31 12.0	81 26 19.7
Gates Mill, in coping stone of west end of south abutment of bridge over Chagrin River, aluminum tablet stamped "Primary Traverse Station No. 22A." Elevation, "729 Cleveland" .....	41 31 02.9	81 24 13.5
Three corners, road to south, 35 feet northwest to telephone pole, 60 feet south to signpost "Chester Cross-roads, 2.5 miles; Cleveland, 16 miles; Chagrin Falls, 7 miles" .....	41 31 10.5	81 23 27.1
Scotland station, center of trolley car track, 50 feet northwest of .....	41 31 20.3	81 21 33.4
Chester triangulation station, U. S. Lake Survey. No station or reference marks could be found. Approximate location of center identified by ruins of observation tripod .....	41 32 02.7	81 21 16.3

*Geographic positions along highways—Continued.*

Station.	Latitude.	Longitude.
Chesterland post-office, H. C. Cottrell & Sons' store, in west wall at northwest corner of stone foundation, bronze tablet stamped "Primary Traverse Station, No. 37A." Elevation, "1,217 Cleveland".....	41 31 19.0	81 20 15.4
Chesterland post-office, four corners, 1 mile east of, 35 feet southeast to signpost, 25 feet northeast to mail box.	41 31 17.6	81 18 48.1
Four corners, 30 feet east to signpost, 40 feet northwest to corner fence post, 35 feet south to corner fence post....	41 31 17.1	81 16 55.0
Fowlers Mill, in coping stone at north end of west abutment of bridge over Chagrin River west of, stamped "Primary Traverse Station No. 51A." Elevation, "1,111 Cleveland".....	41 31 31.4	81 15 39.2
Fowlers Mill, 1 mile east of, four corners, 50 feet northeast to signpost, 25 feet southeast to telephone pole.....	41 31 42.8	81 14 36.5
Munson Township, school district No. 6, four corners at brick schoolhouse.....	41 31 45.4	81 13 00.1
Munson Township, school district No. 6, southeast corner of brick schoolhouse.....	41 31 46.2	81 13 01.2
Munson-Newberry, town line between.....	41 30 00.8	81 12 58.7
Munson Township, four corners, 50 feet northeast to small apple tree, 30 feet southwest to telephone pole.....	41 29 41.2	81 13 02.3
North Newberry, four corners, 60 feet northwest to southeast corner of house, 50 feet southeast to telephone pole.	41 29 42.9	81 11 37.2
Alderman's mill, four corners, 20 feet north to mail box, 25 feet south to telephone pole.....	41 29 51.6	81 09 50.1
Three corners, road north, 20 feet south to telephone pole.	41 29 49.8	81 07 37.2
East Claridon, 1.5 miles southwest of, four corners, 34 feet northwest to nail in maple tree, 23 feet southwest to nail in tree.....	41 31 12.9	81 07 32.5
Claridon triangulation station, U. S. Lake Survey.....	41 30 39.38	81 07 05.33
Baltimore and Ohio Railroad, center of track at road crossing.....	41 30 18.6	81 06 07.0
Four corners, 300 feet west of bridge, 45 feet south to 3-pronged cherry tree, 75 feet north to dead oak tree...	41 30 04.2	81 04 17.2
Huntsburg, 2 miles south of, four corners, 50 feet northeast to maple tree, 30 feet southeast to signpost, Huntsburg, 2 miles, Middlefield, 4 miles.....	41 30 35.1	81 03 06.4
Huntsburg, 2.5 miles south of, 0.5 mile east of four corners, in corner stone at south end of west abutment of steel bridge over branch of Phelps Creek, bronze tablet stamped "Primary Traverse Station, No. 122".....	41 30 35.2	81 02 37.3
Ashtabula-Geauga county line, four corners, 1.75 miles west of Iona.....	41 30 31.1	81 00 11.4

*Geographic positions along highways from a point 1 mile east of Fowlers Mill to Painesville.*

Station.	Latitude.	Longitude.
Chardon, 1 mile southeast of, forks of road, 25 feet east to signpost.....	41 33 43.2	81 12 04.6
Chardon, in first stone of banister to west end of stone steps to south entrance to court-house, aluminum tablet stamped "Primary Traverse Station, No. 14".....	41 34 57.2	81 12 12.2
White church, four corners at, 45 feet southeast to maple tree, 35 feet southwest to telephone pole.....	41 37 35.1	81 13 12.8
Concord station, Baltimore and Ohio Railroad, center of main track and road crossing.....	41 39 55.1	81 13 18.2
Concord, in large stone at east end of culvert, 250 feet north of Baltimore and Ohio Railroad, bronze tablet stamped "Elevation, 987, Cleveland".....	41 39 57.3	81 13 18.7
Concord Center, four corners, 30 feet northeast to maple tree, 45 feet southwest to maple tree.....	41 40 28.0	81 13 27.9
Painesville, 1 mile south of, three corners and forks of road to southwest, 45 feet northeast to yard fence, 35 feet southeast to maple tree.....	41 42 24.1	81 14 20.1
Painesville, First Congregational Church spire, located by triangulation of U. S. Lake Survey.....	41 43 25.76	81 14 43.37
Painesville, intersection of East Main and North State streets.....	41 43 33.5	81 14 28.7
Painesville, Episcopal Church spire, located by triangulation of U. S. Lake Survey.....	41 43 40.98	81 14 35.16

ALLEN, AUGLAIZE, BUTLER, CLARK, CLINTON, DARKE, FAYETTE, FRANKLIN, GREENE, HAMILTON, MADISON, MERCER, MIAMI, MONTGOMERY, PREBLE, VAN WERT, AND WARREN COUNTIES; BROOKVILLE, CELINA, DAYTON, GREENVILLE, HAMILTON, LONDON, LIMA, MASON, MIDDLETOWN, ST. HENRY, SOUTH CHARLESTON, SPRINGFIELD, VAN WERT, WEST MANCHESTER, AND WILMINGTON QUADRANGLES.

The following geographic positions were determined from primary traverse in 1903 by Mr. Geo. T. Hawkins, topographer. The line starts from the adjusted position of crossing of the Pennsylvania and Toledo and Ohio Central railways about 5 miles northwest of Columbus, follows Toledo and Ohio Central Railway southeast to edge of Columbus, thence along Pennsylvania Railroad to London, thence along "Big Four" Railway to Springfield, thence along the Erie and "Big Four" railways to Dayton, thence along the Pennsylvania Railroad and the Dayton and Union Railroad to Greenville, thence along Cincinnati Northern Railroad to Haviland, and is connected with lines run in 1901.

This work was supplemented by 430 miles of primary traverse run by Mr. J. R. Ellis, topographic aid, along public highways, following the parallels and meridians bounding 15-minute quadrangles as closely as possible. The lines are tied and adjusted to positions located by Mr. Hawkins's line.

*Geographic positions along the Pennsylvania Railroad from a point 5 miles northwest of Columbus to London.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Toledo and Ohio Central and Pennsylvania railroads northwest of Columbus, crossing of.....	40 00 04.5	83 05 57.4
Sullivant road crossing, 0.75 mile north of .....	39 57 58.9	83 04 38.8
Pike and telephone road crossing.....	39 57 55.1	83 05 43.5
Milepost 6, road crossing 400 feet west of.....	39 57 51.7	83 06 40.5
Milepost 8, road crossing 200 feet east of .....	39 57 44.3	83 08 47.3
Mileposts 8 and 9, road crossing between .....	39 57 42.1	83 09 27.6
Alton, road crossing at .....	39 57 40.3	83 10 00.9
Pike and telephone road crossing northwest and southeast .....	39 57 33.2	83 12 12.0
Overhead road crossing.....	39 57 27.5	83 13 57.3
Pike and telephone road crossing.....	39 57 16.8	83 15 16.6
West Jefferson station, road crossing at .....	39 56 48.6	83 16 08.9
West Jefferson, National road crossing.....	39 56 40.3	83 16 23.9
Milepost 19, north and south road crossing 350 feet west of.....	39 55 08.5	83 20 34.5
Milepost 20, north and south road crossing 100 feet east of.....	39 54 49.1	83 21 31.0
Milepost 22, north and south road crossing 0.25 mile west of.....	39 54 01.7	83 23 48.4
London, crossing of "Big Four" Railway.....	39 53 04.7	83 26 33.5

*Geographic positions along the "Big Four" Railway between London and Springfield.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
London, road crossing west of station.....	39 53 03.2	83 26 45.6
London, High street crossing .....	39 53 01.5	83 37 08.8
Gravel road crossing .....	39 53 16.4	83 30 01.0
Myers, road crossing 0.25 mile west of.....	39 53 25.3	83 31 45.3
Dirt road crossing .....	39 53 30.7	83 33 12.5
Gravel road and telephone road crossing.....	39 53 37.8	83 35 13.6
Plattsburg, pike crossing at .....	39 53 43.8	83 36 40.8
Gravel road and telephone road crossing.....	39 53 51.5	83 38 20.5
Brooks, road crossing at .....	39 54 02.0	83 40 35.0
Oxtobys, road crossing at.....	39 54 07.2	83 41 43.2
Pike and telephone road crossing.....	39 54 16.3	83 43 47.9
Overhead road crossing.....	39 54 22.2	83 44 40.0
Detroit Southern Railroad, crossing of.....	39 54 31.4	83 45 53.5
Gravel road crossing .....	39 54 33.0	83 46 15.8
Detroit Southern Railroad, crossing of.....	39 54 37.4	83 46 33.5
Springfield, Limestone street car line, crossing of.....	39 55 20.2	83 48 31.0
Springfield, National road crossing .....	39 55 35.3	83 50 32.3
Overhead road crossing.....	39 55 10.1	83 51 41.6

*Geographic positions along the Erie Railway between Durbin and milepost 376.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Durbin, milepost 369 .....	39	54	42.5	83	53	21.7
Snyderville, road crossing .....	39	54	04.7	83	54	48.1
Enon, road crossing .....	39	53	22.6	83	56	08.6
Mileposts 375 and 376, road crossing half way between...	39	51	53.1	83	59	38.6
Mileposts 376 and 377, road crossing half way between...	39	51	28.1	84	00	37.9

*Geographic positions along the "Big Four" Railway between Osborn and Dayton.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Osborn station, road crossing 1 mile north of .....	39	51	11.6	84	01	11.9
Osborn, road crossing north of station .....	39	50	39.2	84	01	58.8
Osborn, road crossing north and south .....	39	50	33.9	84	02	05.7
Gravel road and telephone road crossing at .....	39	49	43.4	84	03	04.8
Simms, road crossing at .....	39	48	35.8	84	04	23.9
Pike and telephone road crossing, east and west .....	39	47	12.9	84	06	42.6
Harshman, road crossing at .....	39	46	54.8	84	07	14.7
Street car trestle, road crossing at .....	39	46	41.2	84	08	22.9
Dayton, Third street car track, crossing of .....	39	45	40.3	84	10	55.5
Dayton, first street car line east of station, crossing of .....	39	45	18.8	84	11	32.4

*Geographic positions along the Pennsylvania Railroad between Dayton and Dodson.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Dayton, Germantown street, crossing of .....	39	45	04.1	84	12	24.0
Dayton, Third street car line, crossing of .....	39	45	20.6	84	12	57.2
Wagon bridge crossing, at north end of .....	39	46	01.5	84	14	09.9
Road crossing, north and south .....	39	46	26.7	84	15	12.5
Cincinnati, Hamilton and Dayton Railway, crossing of .....	39	46	44.2	84	15	55.9
Milepost 35, road crossing 500 feet west of .....	39	47	23.0	84	17	33.0
Trotwood, road crossing north and south at .....	39	47	50.1	84	18	40.6
Milepost 33, road crossing $\frac{1}{2}$ mile west of .....	39	48	17.4	84	19	48.9
Mileposts 31 and 32, road crossing between .....	39	48	43.5	84	20	53.9
Airhill, road crossing north and south .....	39	49	10.5	84	22	01.0
Mileposts 29 and 30, road crossing north and south between .....	39	49	38.4	84	23	10.2
Brookville station, road crossing 200 feet west of .....	39	50	13.1	84	24	36.9
Milepost 27, road crossing north and south .....	39	50	33.6	84	25	28.4
Dodson, road crossing north and south .....	39	51	02.1	84	26	40.1

*Geographic positions along the Dayton and Union Railroad between Bachman and Greenville.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Bachman, crossing of National road .....	39	51	46.4	84	27	29.0
Wengerlawn, road crossing east and west .....	39	52	26.2	84	27	58.9
Wrights, road crossing.....	39	53	20.4	84	28	40.0
Gillispie's road crossing.....	39	53	55.1	84	29	06.0
West Baltimore, road crossing.....	39	54	12.6	84	29	19.0
Mileposts 20 and 21, north and south road crossing between.....	39	54	41.5	84	29	40.6
Gordon, street car line and road, crossing of.....	39	55	58.0	84	30	37.7
Milepost 23, east and west road crossing 1,000 feet north of.....	39	56	49.8	84	31	16.5
Mileposts 24 and 25, east and west road crossing between... ..	39	57	41.5	84	31	55.8
Mileposts 25 and 26, east and west road crossing between... ..	39	58	33.6	84	32	35.2
Arcanum, crossing "Big Four" Railway.....	39	59	16.3	84	33	07.5
Arcanum, road crossing east and west.....	39	59	19.8	84	33	10.1
Iron bridge, road crossing east and west .....	40	00	19.2	84	33	54.6
Mileposts 28 and 29, road crossing between.....	40	01	00.3	84	34	25.2
Delisle, road crossing at.....	40	01	10.9	84	34	33.0
Jaysville, road crossing east and west at.....	40	02	55.4	84	35	50.0
Mileposts 32 and 33, road crossing between.....	40	03	47.9	84	36	29.0
Mileposts 34 and 35, road crossing between.....	40	05	16.7	84	37	33.3

*Geographic positions along the Cincinnati Northern Railroad between Greenville and Haviland.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Greenville, Dayton and Union, and Pennsylvania railroads, crossing of.....	40	05	43.5	84	37	38.2
Greenville, crossing north of Dayton and Union station ..	40	05	58.8	84	37	40.0
Greenville, crossing of Dayton and Union Railroad .....	40	06	30.1	84	38	23.3
Road crossing northwest and southeast .....	40	07	19.6	84	38	47.6
Road crossing east and west.....	40	08	10.2	84	38	47.8
Road crossing east and west.....	40	09	02.8	84	38	48.0
Church, road crossing 500 feet west of .....	40	09	55.6	84	38	47.9
Meekers, crossing Pennsylvania and Dayton and Union railroads at .....	40	10	16.6	84	38	47.9
House, road crossing east and west, 200 feet southeast of.....	40	11	35.1	84	38	37.0
Road crossing east and west.....	40	12	27.9	84	38	24.9
Ansonia, crossing "Big Four" and Dayton and Union railroads at .....	40	12	43.4	84	38	24.9
Road crossing east and west.....	40	13	31.4	84	38	35.2
Bridge, east and west road crossing west of .....	40	15	02.5	84	38	34.7

*Geographic positions along the Cincinnati Northern Railroad between Greenville and Haviland—Continued.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Oak Tree, east and west road crossing 150 feet southwest of.	40	15	54.4	84	38	32.6
Rossville, east and west road crossing at .....	40	16	46.6	84	38	22.8
Road crossing east and west .....	40	17	38.8	84	38	37.6
Trestle, road crossing under railway at south end of .....	40	18	31.2	84	38	37.1
Road crossing east and west .....	40	19	23.7	84	38	36.6
New Weston, road crossing at .....	40	20	15.8	84	38	36.2
Gilbert, road crossing at .....	40	21	07.6	84	38	36.1
Road crossing east and west .....	40	21	59.8	84	38	36.1
Road crossing east and west .....	40	23	32.9	84	38	36.1
Road crossing east and west .....	40	24	25.3	84	38	36.1
St. Henry, road crossing at .....	40	25	05.0	84	38	36.1
Road crossing east and west .....	40	26	10.8	84	38	36.1
Baradees, road crossing at .....	40	27	03.3	84	38	36.0
Road crossing east and west .....	40	27	55.9	84	38	16.3
Coldwater, road crossing at .....	40	28	47.9	84	37	38.4
Blind siding, road crossing east and west, 200 feet south of.	40	30	07.5	84	36	32.1
Pike crossing east and west .....	40	31	39.5	84	35	05.5
Celina, main road crossing in southwest part of .....	40	32	46.0	84	34	35.8
Cemetery, road crossing east and west at .....	40	33	38.1	84	34	39.8
Road crossing east and west .....	40	34	30.6	84	35	09.5
Road crossing east and west .....	40	35	49.8	84	35	53.8
Schoolhouse, east and west road crossing, 0.25 mile west of.	40	36	42.3	84	36	23.7
Road crossing east and west .....	40	37	34.8	84	36	53.8
Tana, road crossing east and west at .....	40	38	01.0	84	37	08.9
Schoolhouse, road crossing 800 feet west of .....	40	39	19.3	84	37	52.7
Road crossing east and west .....	40	40	38.1	84	38	33.4
Rockford, road crossing at .....	40	41	27.2	84	38	43.6
Road crossing northeast and southwest .....	40	41	53.5	84	38	42.0
Road crossing north and south .....	40	42	54.3	84	38	16.7
Schoolhouse, road crossing east and west, 0.25 mile east of.	40	44	33.3	84	37	34.0
Pipeline and road crossing, east and west .....	40	45	25.9	84	37	11.3
Ohio City, Toledo, St. Louis and Western Railroad, crossing of .....	40	46	13.2	84	36	51.9
Ohio City, crossing telephone line and street .....	40	46	18.6	84	36	49.7
Road crossing east and west .....	40	47	11.2	84	36	28.4
Road crossing east and west .....	40	48	03.6	84	36	07.0
Road crossing east and west 100 feet west of pike .....	40	49	22.3	84	35	27.1
Road crossing east and west .....	40	50	14.8	84	35	26.7
Van Wert, crossing of main road in southwest part of .....	40	51	55.2	84	35	27.0
Van Wert, Pennsylvania Railroad, crossing of .....	40	52	20.4	84	35	19.1
Road crossing east and west .....	40	54	11.2	84	34	53.2

*Geographic positions along the Cincinnati Northern Railroad between Greenville and Haviland—Continued.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Bridge, east and west road crossing 300 feet west of.....	40	55	03.4	84	34	53.5
Bridge, east and west road crossing 400 feet west of.....	40	56	21.9	84	34	54.1
Cavett station, road crossing at.....	40	56	48.0	84	34	54.3
Road crossing east and west.....	40	57	40.4	84	34	54.7
Sawmill, east and west road crossing at.....	40	58	32.6	84	34	55.1
Scott, east and west road crossing at.....	40	59	25.0	84	34	55.3
East and west road crossing.....	41	00	17.5	84	34	55.4
Haviland, Findlay, Fort Wayne and Western and Cincinnati and Northern railroads, crossing at.....	41	01	08.0	84	34	56.0

**Madison County; London quadrangle.**

This line starts from an adjusted position 4 miles north of West Jefferson and follows public highways as near as possible along the north and west borders of the London quadrangle, connecting with adjusted position at Sedalia.

*Geographic positions along highways.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
West Jefferson, 4 miles north of, T road southwest at schoolhouse.....	39	59	53.5	83	15	50.9
T road northeast.....	39	59	17.7	83	17	02.5
Gregor schoolhouse, T road southwest at.....	39	59	54.6	83	17	30.9
T road northeast.....	39	58	50.4	83	19	39.3
Gillivan post-office, crossroads at.....	39	59	19.0	83	20	13.4
Little Darby Creek, center of bridge.....	39	58	18.4	83	21	23.8
Urbana pike and pike northeast and southwest, crossing of.....	39	57	59.7	83	21	45.5
Deer Creek, Jefferson and Monroe townships, stone monument between.....	39	58	15.3	83	22	15.4
Road north.....	39	58	29.6	83	22	42.0
Crossroads.....	39	58	46.6	83	23	32.0
Schoolhouse, crossroads at.....	39	59	35.6	83	25	14.3
Tradersville, crossroads 2 miles northeast of.....	40	01	02.8	83	27	56.6
Tradersville, intersection of roads 1 mile northeast of....	40	00	24.2	83	28	52.2
Tradersville, crossroads at.....	40	00	00.7	83	29	54.9
Road southeast.....	39	59	14.8	83	29	52.1
Y road southeast.....	39	57	17.3	83	30	20.5
Covered bridge, center of.....	39	56	45.5	83	30	09.2
Summerford, crossroads at.....	39	56	01.5	83	29	30.9



*Geographic positions along highways—Continued.*

Location.	Latitude.			Longitude.		
	°	'	"	°	'	"
Summerford, T road south $\frac{1}{2}$ mile west of .....	39	56	00.0	83	30	04.9
Tile factory, private road west at .....	39	54	59.5	83	30	27.3
T road west .....	39	54	26.0	83	30	28.8
State fishery, T road north at .....	39	53	45.5	83	30	32.5
"Big Four" Railway, gravel road crossing of: Azimuth of R. R. 276° 21' .....	39	53	16.4	83	30	01.0
South Charleston and London pike, T road north at .....	39	52	10.6	83	29	40.9
Union and Paint townships, stone monument between .....	39	51	09.5	83	29	45.7
Pennsylvania Railroad, north and south road crossing .....	39	52	02.1	83	29	37.2
T road north .....	39	50	34.5	83	29	49.1
Walnut Run, intersection of pike 1 mile north of .....	39	50	59.3	83	27	57.6
Walnut Run, crossing of pikes at .....	39	50	06.7	83	27	54.9
T road west .....	39	47	22.2	83	28	28.7
Creighton schoolhouse, T road east at .....	39	45	20.1	83	28	53.8
Sedalia, cross streets at .....	39	44	00.5	83	28	36.7

**Butler and Hamilton counties; Hamilton and Mason quadrangles.**

Additional control for the Hamilton and Mason quadrangles was obtained by J. R. Ellis, topographic aid, who ran a line via highways, approximately on the meridian of 84° 30' between Carthage and Trenton, established by him in 1902.

*Geographic positions along highways.*

Location.	Latitude.			Longitude.		
	°	'	"	°	'	"
Carthage, crossing of Fifth street and Cincinnati, Hamilton and Dayton Railroad .....	39	11	54.5	84	28	56.9
Hartwell, Clark avenue, east .....	39	13	18.9	84	28	22.6
Parkplace, Allen avenue, west .....	39	14	32.7	84	28	15.5
T. 3 N., R. 1 E., corner secs. 4, 5, 10, 11, Sullivan road, east .....	39	15	28.9	84	28	09.7
Springdale, Banklick road, east and west .....	39	17	13.8	84	29	04.9
Butler and Hamilton county line, road east .....	39	18	06.9	84	29	04.9
Jones, crossing of road and Cincinnati, Hamilton and Dayton Railroad .....	39	19	20.3	84	29	37.5
Flockton, crossing of road and Pennsylvania Railroad .....	39	21	08.7	84	29	25.6
Hamilton and Princeton pike, east and west .....	39	23	22.9	84	28	48.6
Flenner's Corners, road northeast and southwest .....	39	24	58.1	84	28	29.9
Wooddale, road intersection .....	39	25	58.4	84	28	31.5
Tps. 4 and 5 N., Rs. 3 and 4 E., corner of .....	39	28	51.0	84	28	35.8

Darke, Miami, Montgomery, and Preble counties; Brookville quadrangle.

This line starts from adjusted position about 4 miles southwest of Troy and follows public highways and "Big Four" Railway to north-west corner of quadrangle, thence south along border of quadrangle and connects with traverse line of Mr. George T. Hawkins at Baltimore, thence south to southwest corner of quadrangle, connecting with adjusted position.

*Geographic positions along highways.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
T. 4, R. 6, corner secs. 4, 5, 8, and 9, crossroads near . . . . .	39	59	44.6	84	13	19.9
T. 4, R. 5, corner secs. 5, 6, 7, and 8. . . . .	39	59	43.0	84	14	19.7
Tps. 4 and 6, Rs. 5 and 6, corner secs. 1, 6, 7, and 12. . . . .	39	59	42.0	84	15	27.7
Burckett pike crossing, "Big Four" Railway . . . . .	39	59	41.9	84	15	49.0
T. 6, R. 5, corner secs. 2, 3, 10, and 11. . . . .	39	59	40.5	84	17	41.9
Burckett pike crossing, on curve, "Big Four" Railway . . . . .	39	59	39.7	84	18	36.6
Ludlow Falls station, T road east, 0.5 mile south of. . . . .	39	59	37.9	84	20	08.6
Ludlow Falls station, road crossing 160 feet west of. . . . .	39	59	50.7	84	20	14.2
Road crossing north and south near mile post 316: Azimuth of railroad 97° 18' . . . . .	39	59	31.8	84	21	40.7
Laura station, pike crossing 1 mile east of. . . . .	39	59	31.5	84	23	34.4
Laura station, road crossing north and south at. . . . .	39	59	25.4	84	24	30.6
T. 7, R. 4, corner secs. 3, 4, 9, and 10. . . . .	39	59	32.5	84	25	38.2
Section line road crossing north and south . . . . .	39	59	19.3	84	26	47.0
Section line crossing north and south. . . . .	39	59	18.8	84	27	54.0
Pittsburg, township line road crossing north and south, Pittsburg azimuth of tangent, "Big Four" Railway, 89° 26' . . . . .	39	59	18.2	84	29	14.3
Tps. 7 and 8, Rs. 3 and 4, corner secs. 7, 12, 13, and 18. . . . .	39	58	36.2	84	29	13.2
Germany, schoolhouse, crossroads about 900 feet east of. . . . .	39	57	45.1	84	28	49.3
Crossroads . . . . .	39	57	19.2	84	28	48.6
Schoolhouse No. 6, T road south at. . . . .	39	56	01.5	84	28	59.3
Crossroads at line between Darke and Montgomery counties. . . . .	39	59	07.5	84	28	58.1
Baltimore, Tps. 6 and 7, Rs. 3 and 4 E., corner secs 1, 6, 12, and 7 . . . . .	39	54	12.6	84	29	06.5
Dayton and Union Railroad, at county line crossing . . . . .	39	53	55.1	84	29	06.0
Tps. 6 and 7, Rs. 3 and 4 E., corner secs. 7, 12, 13, and 18. . . . .	39	53	20.1	84	29	05.0
Tps. 6 and 7, Rs. 3 and 4 E., corner secs. 13, 18, 19 and 24: Azimuth of Pennsylvania Railroad 0.5 mile north of national road, 297° 27' . . . . .	39	52	27.7	84	29	03.6
Crossing National road and county line road. . . . .	39	51	36.5	84	29	02.2
Tps. 6 and 7, Rs. 3 and 4 E., corner secs. 25, 30, 31, and 36. . . . .	39	50	42.6	84	29	00.9
Tps. 5, 6, and 7, Rs. 3 and 4 E., corner secs. 1, 6, 31, and 36. . . . .	39	49	50.2	84	28	59.8

*Geographic positions along highways—Continued.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Tps. 5 and 6, Rs. 3 and 4 E., quarter corner between secs. 7 and 12 .....	39 48 37.2	84 28 58.1
Tps. 5 and 6, Rs. 3 and 4 E., corner secs. 7, 12, 13, and 18..	39 48 11.2	84 28 57.5
Tps. 5 and 6, Rs. 3 and 4 E., corner secs. 13, 18, 19, and 24..	39 47 18.7	84 28 56.3
Tps. 5 and 6, Rs. 3 and 4 E., corner secs. 19, 24, 25, and 30..	39 46 26.9	84 28 55.0
Tps. 5 and 6, Rs. 3 and 4 E., corner secs. 25, 30, 31, and 36..	39 45 34.4	84 28 53.9

**Miami and Montgomery counties; Dayton quadrangle.**

This line starts from a located point near Byron and follows public highways along south, west, and north borders of quadrangle, connecting at Dayton with line run by Mr. George T. Hawkins, and tied to position at northwest corner of Springfield quadrangle.

*Geographic positions along highways.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Beaver Creek schoolhouse, T road south, $\frac{1}{3}$ mile north of.	39 46 04.2	84 00 43.4
Beaver Creek schoolhouse, T road south, $\frac{2}{3}$ mile south of.	39 45 11.1	84 00 47.6
T. 3, R. 7, quarter corner between secs. 22 and 28 .....	39 45 13.2	84 01 28.6
T. 3, R. 7, quarter corner between secs. 28 and 34 .....	39 45 17.2	84 02 38.2
Big Woods schoolhouse, crossroads at .....	39 45 19.3	84 03 14.3
T road north .....	39 45 24.4	84 04 37.4
Montgomery-Greene county line, at Fifth street road .....	39 45 29.7	84 06 00.9
Cincinnati, Hamilton and Dayton Railroad at Fifth street road crossing .....	39 45 34.7	84 07 18.7
East Dayton, intersection Smithville road and Huffman avenue .....	39 45 27.7	84 08 18.6
Dayton, crossing of Huffman and Linden avenues .....	39 45 32.2	84 09 32.6
Dayton, crossing of Dayton and Union Railroad and Third street .....	39 45 40.3	84 10 55.5
Dayton, crossing of Third and Main streets .....	39 45 34.7	84 11 30.3
Dayton, intersection of Salem and Oxford avenues in northwest part of .....	39 46 09.4	84 12 40.9
Dayton, intersection Salem avenue and Catalpa drive....	39 46 56.9	84 13 31.7
T. 2, R. 6, corner secs. 17, 18, 19, and 20 .....	39 47 27.7	84 14 06.0
T. 2, R. 6, corner secs. 7, 8, 17, and 18 .....	39 48 20.6	84 14 05.9
Shiloh church, crossroads at .....	39 49 11.4	84 14 07.4
Tps. 2, 3, 4, and 5, Rs. 5 and 6, corner secs. 31, 36, 1 and 6..	39 50 01.4	84 15 15.2
T. 3, R. 6, quarter corner between secs. 30 and 31 .....	39 50 53.8	84 14 44.0
Spanker, crossroads at .....	39 51 33.0	84 14 42.3

*Geographic positions along highways—Continued.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Spanker, T road east, 1 mile north of.....	39 52 16.6	84 14 43.1
Crossing National road and north and south road.....	39 53 13.4	84 14 43.6
T. 3, R. 6, quarter corner between secs. 6 and 7.....	39 54 28.3	84 14 45.1
Tps. 3 and 4, R. 6, quarter corner between secs. 6 and 31 and line between Montgomery and Miami counties....	39 55 20.2	84 14 46.2
T. 4, R. 6, quarter corner between secs. 31 and 32.....	39 55 47.0	84 14 12.8
Schoolhouse No. 5, intersection of northeast and south- west road and road south.....	39 56 56.2	84 14 14.6
Troy, crossroads 5 miles southwest of.....	39 57 57.9	84 13 39.1
Troy, crossroads 4 miles southwest of.....	39 58 51.5	84 13 20.4
T. 4, R. 6, corner secs. 9, 10, 15, and 16.....	39 58 52.3	84 12 17.4
Schoolhouse No. 11, crossroads near.....	39 58 53.5	84 11 08.1
Lost Creek, center of bridge over.....	39 59 07.4	84 09 40.9
Grayson, road crossing "Big Four" Railway azimuth 312° 40'.....	39 59 44.9	84 08 39.3
Ragtown, T road south at.....	40 00 04.2	84 07 29.5
T. 2, R. 10, corner secs. 14, 15, 20, and 21.....	39 59 57.4	84 05 47.2
T. 2, R. 10, corner secs. 8, 9, 14, and 15.....	39 59 53.4	84 04 39.1
T. 2, R. 10, corner secs. 2, 3, 8, and 9.....	39 59 49.1	84 03 31.6
Alcony, crossroads 1 mile east of.....	40 00 34.0	84 02 33.6
Alcony, T road south, 2 miles east of.....	40 00 07.8	84 01 12.8
Crossroads.....	39 59 42.4	84 00 02.5

**Darke County; Greenville quadrangle.**

This line starts from adjusted position at Pittsburg and follows highways north, along east border of quadrangle to northeast corner of same; thence west along highways to northwest corner of quadrangle; thence south along highways, connecting with adjusted position 2 miles north of New Madison.

*Geographic positions along highways.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Pittsburg, road crossing "Big Four" Railway.....	39 59 18.2	84 29 14.3
T. 8 N., Rs. 3 and 4 E., corner secs. 1, 6, 7, and 12.....	39 59 28.6	84 29 14.6
Tps. 7, 8, and 9 N., Rs. 3 and 4 E., corner secs. 1, 6, 31, and 36.....	40 00 23.1	84 29 16.3
Tps. 8 and 9 N., Rs. 3 and 4 E., corner secs. 25, 30, 31, and 36..	40 01 15.6	84 29 17.8
Tps. 8 and 9 N., Rs. 3 and 4 E., cornersecs. 19, 24, 25, and 30..	40 02 07.9	84 29 19.4
Tps. 8 and 9 N., Rs. 3 and 4 E., cornersecs. 13, 18, 19, and 24..	40 03 00.5	84 29 21.1

*Geographic positions along highways—Continued.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Tps. 8 and 9 N., Rs. 3 and 4 E., corner secs. 7, 12, 13, and 18.	40	03	53.0	84	29	22.8
Tps. 8 and 9 N., Rs. 3 and 4 E., corner secs. 1, 6, 7, and 12.	40	04	45.2	84	29	24.3
Tps. 8, 9, and 10 N., Rs. 3 and 4 E., corner secs. 1, 6, 31, and 36.....	40	05	43.2	84	29	26.1
Gettysburg, crossing Main street and north and south road.	40	06	42.0	84	29	44.4
Gettysburg, crossroads 0.5 mile north of .....	40	07	21.9	84	29	50.9
Pennsylvania Railroad at north and south road crossing, 400 feet east of milepost 87, azimuth 103° 20'.....	40	08	38.8	84	29	53.1
Oakland church, T road south, 0.25 mile east of.....	40	09	07.5	84	29	53.6
Oakland church, T road east, 1 mile north of .....	40	09	57.4	84	30	03.9
Webster crossroads, 1 mile west of .....	40	10	53.0	84	30	04.8
T. 11 N., R. 3 E?, quarter corner between secs. 25 and 36.	40	11	45.5	84	30	10.2
T. 11 N., R. 3 E., quarter corner between secs. 24 and 25.	40	12	38.0	84	30	11.2
T. 11 N., R. 3 E., corner secs. 23, 24, 25, and 26, 4,000 feet north of last; "Big Four" Railway azimuth=84° 37'..	40	12	37.2	84	30	46.0
T. 11 N., R. 3 E., corner secs. 13, 14, 23, and 24.....	40	13	29.8	84	30	47.4
Versailles, crossing Versailles and Brock pike and north and south road 2 miles northwest of .....	40	14	26.4	84	30	48.6
Frenchtown, crossroads 0.5 mile east of .....	40	14	48.5	84	30	49.2
Frenchtown, T road south 0.5 mile west of.....	40	14	47.1	84	32	15.9
Frenchtown, crossroads 2 miles west of.....	40	14	45.3	84	34	00.6
T road south.....	40	15	21.1	84	35	24.7
Schoolhouse No. 6, T road west at.....	40	15	28.3	84	35	57.6
T. 13 N., R. 2 E., quarter corner between secs. 1 and 2 ..	40	15	28.1	84	36	52.3
T road east, near quarter corner between secs. 2 and 3, T. 13 N., R. 2 E.....	40	15	28.4	84	38	10.9
Cincinnati Northern Railroad at east and west road crossing.....	40	15	02.5	84	38	34.7
T. 13 N., R. 2 E., corner secs. 3, 4, 9, and 10.....	40	15	02.5	84	39	08.8
T. 13 N., R. 2 E., quarter corner between secs. 8 and 9 ..	40	14	36.3	84	40	17.5
T. 13 N., R. 2 E., quarter corner between secs. 7 and 8, crossroads near.....	40	14	36.7	84	41	36.3
T. 13 N., Rs. 1 and 2 E., quarter corner between secs. 7 and 12.....	40	14	37.1	84	42	32.5
T. 13 N., R. 1 E., quarter corner secs. 11 and 12.....	40	14	40.6	84	43	40.7
T. 13 N., R. 1 E., corner secs. 11, 12, 13, and 14.....	40	14	14.3	84	43	40.4
T. 13 N., R. 1 E., corner secs. 13, 14, 23, and 24.....	40	13	21.8	84	43	39.9
T. 13 N., R. 1 E., corner secs. 23, 24, 25, and 26; 900 feet south of this, "Big Four" Railway azimuth=84° 29'..	40	12	29.3	84	43	39.2
T. 13 N., R. 1 E., corner secs. 25, 26, 35, and 36; one-half mile south of this, Pennsylvania Railroad azimuth=103° 19'.....	40	11	36.7	84	43	39.2
Tps. 12 and 13 N., R. 1 E., quarter corner secs. 1, 2, 35, and 36.....	40	10	43.7	84	43	39.0

*Geographic positions along highways—Continued.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
T. 12 N., Rs. 1 and 2 E., quarter corner secs. 1, 6, 7, and 12.....	40 09 55.5	84 42 29.2
T. 12 N., Rs. 1 and 2 E., quarter corner secs. 7 and 18....	40 09 02.6	84 42 28.3
Coaltown, center of bridge 0.25 mile west of.....	40 08 04.0	84 42 22.2
Coaltown, T road east 1.5 miles southwest of.....	40 07 17.6	84 42 26.5
Greenville and Spartansburg and Coaltown and New Manchester pikes, crossing of.....	40 05 41.8	84 42 24.8
Greenville and Winchester and Coaltown and New Manchester pikes, crossing of.....	40 06 23.4	84 42 25.5
T. 11 N., Rs. 1 and 2 E., corner secs. 1, 6, 7, and 12.....	40 04 38.5	84 42 23.4
T. 11 N., R. 1 E., corner secs. 1, 2, 11, and 12.....	40 04 38.2	84 43 30.4
T. 11 N., R. 1 E., corner secs. 11, 12, 13, and 14.....	40 03 45.7	84 43 29.5
T. road west.....	40 02 33.7	84 43 27.4
T. 11 N., R. 1 E., corner secs. 25, 26, 35, and 36.....	40 01 08.3	84 43 25.8

*Geographic positions along the "Big Four" Railway.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Charles station, road crossing 1 mile southeast of.....	40 00 15.7	84 42 37.0
Pike crossing north and south under trestle.....	40 00 05.4	84 42 18.4
Pennsylvania Railroad, crossing of.....	39 59 23.0	84 41 02.3

**Allen and Auglaize counties; Lima quadrangle.**

This line, run by Mr. J. R. Ellis, starts from adjusted position at Kemp station and follows south along public highways to southwest corner of quadrangle, thence east on public highways along south border of quadrangle to Santa Fe, thence north on public highways to adjusted position at Westminster station.

*Geographic positions along highways.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Kemp station, azimuth of railroad 267° 26'.....	40 43 25.6	84 13 27.6
Kemp station, crossroads 0.5 mile south of.....	40 42 52.9	84 13 23.3
T. 4 S., Rs. 5 and 6 E., corner secs. 7, 12, 13, and 18....	40 42 01.9	84 13 22.7
T. 4 S., Rs. 5 and 6 E., corner secs. 13, 18, 19, and 24....	40 41 09.6	84 13 22.3
T road west.....	40 40 17.4	84 13 21.9
T. 4 S., R. 6 E., quarter corner between secs. 29 and 30..	40 39 51.6	84 12 13.0
Hume, azimuth of Lake Erie and Western Railroad, 228° 45', crossroads 0.5 mile south of.....	40 39 12.2	84 12 12.4

*Geographic positions along highways—Continued.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
T. 5 S., R. 6 E., corner secs. 5, 6, 7, and 8 .....	40	37	41.4	84	12	11.9
T. 5 S., R. 6 E., corner secs. 7, 8, 17, and 18 .....	40	36	48.8	84	12	11.2
T road east .....	40	35	56.3	84	12	10.7
T. 5 S., R. 6 E., quarter corner between secs. 19 and 20 ..	40	35	29.9	84	12	10.4
Wapakoneta, crossing of Blackhoof and Auglaize streets ...	40	34	14.6	84	11	46.2
Wapakoneta, Piqua pike at crossroads 1 mile south of ....	40	33	18.8	84	11	55.7
Schoolhouse, crossroads at .....	40	32	00.2	84	12	09.3
T road west .....	40	31	07.7	84	12	09.1
Schoolhouse, road east, one-third mile north of .....	40	30	41.3	84	12	13.0
Church, crossroads one-fifth mile north of .....	40	29	48.8	84	12	37.0
Cincinnati, Hamilton and Dayton Railroad, at east and west crossing, azimuth of railroad 175° 48' .....	40	29	48.9	84	11	17.5
T. 6 S., R. 6 E., corner secs. 21, 22, 27, and 28 .....	40	29	49.3	84	09	51.5
T. 6 S., R. 6 E., corner secs. 22, 23, 26, and 27 .....	40	29	49.7	84	08	42.6
T. 6 S., R. 6 E., corner secs. 23, 24, 25, and 26 .....	40	29	50.6	84	07	34.2
T. 6 S., Rs. 6 and 7 E., corner secs. 19, 24, 25, and 30....	40	29	51.9	84	06	25.6
T. 6 S., R. 7 E., corner secs. 19, 20, 29, and 30 .....	40	29	51.6	84	05	17.1
T. 6 S., R. 7 E., corner secs. 20, 21, 28, and 29 .....	40	29	51.7	84	04	08.3
T. 6 S., R. 7 E., corner secs. 21, 22, 27, and 28 .....	40	29	51.7	84	02	59.8
T. 6 S., R. 7 E., corner secs. 22, 23, 26, and 27 .....	40	29	51.6	84	01	51.3
T. 6 S., R. 7 E., corner secs. 23, 24, 25, and 26 .....	40	29	51.5	84	00	42.9
Santa Fe, crossroads at .....	40	29	28.4	83	59	37.7
Santa Fe, T road west 1½ miles north of .....	40	30	43.8	83	59	37.8
T. 6 S., Rs. 7 and 8 E., corner secs. 7, 12, 13, and 18 .....	40	31	40.3	83	59	37.9
T. 6 S., Rs. 7 and 8 E., corner secs. 1, 6, 7, and 12 .....	40	32	32.7	83	59	37.8
Tps. 5 and 6 S., Rs. 7 and 8 E., corner secs. 1, 6, 31, and 36.	40	33	25.2	83	59	37.7
T. 5 S., Rs. 7 and 8 E., corner secs. 25, 30, 31, and 36 ....	40	34	17.4	83	59	37.8
T. 5 S., Rs. 7 and 8 E., corner secs. 19, 24, 25, and 30 ....	40	35	09.8	83	59	37.9
T. 5 S., Rs. 7 and 8 E., corner secs. 13, 18, 19, and 24 ....	40	36	02.1	83	59	38.0
T. 5 S., Rs. 7 and 8 E., corner secs. 7, 12, 13, and 18 .....	40	36	54.3	83	59	38.2
T. 5 S., Rs. 7 and 8 E., corner secs. 1, 6, 7, and 12 .....	40	37	46.6	83	59	38.4
Tps. 4 and 5 S., Rs. 7 and 8 E., corner secs. 1, 6, 31, and 36.	40	38	38.7	83	59	38.5
Tps. 4 and 5 S., R. 8 E., corner secs. 5, 6, 31, and 32 .....	40	38	39.1	83	58	31.7
T. 4 S., R. 8 E., corner secs. 29, 30, 31, and 32 .....	40	39	31.4	83	58	32.2
T. 4 S., R. 8 E., corner secs. 19, 20, 29, and 30 .....	40	40	23.6	83	58	32.6
Westminster, T road east at .....	40	41	35.9	83	58	47.4
Westminster, T road north 1 mile northwest of .....	40	42	05.8	83	59	38.6
Westminster station, azimuth of railroad 276° 41' .....	40	42	57.2	83	59	35.3

Butler, Montgomery, Preble, and Warren counties; Middletown quadrangle.

This line starts from adjusted position in West Dayton and follows public highway south along east border of quadrangle to Red Lion post-office, connecting with adjusted position at that place.

*Geographic positions along highways.*

Station.	Latitude.	Longitude.
West Dayton, "Big Four" Railway, east and west crossing, 760 feet north of railroad bridge, azimuth of railroad 12° 02' .....	39 43 57.4	84 12 40.4
West Dayton, intersection of Springboro pike and road, southwest .....	39 43 30.0	84 13 01.6
West Dayton, "Big Four" Railway at Springboro pike crossing, north and south .....	39 42 14.8	84 13 08.5
T. 1, R. 6, corner secs. 10, 11, 16, and 17 .....	39 41 40.3	84 13 11.3
T. 1, R. 6, quarter corner between secs. 9 and 15 .....	39 40 23.9	84 13 17.7
Tps. 1 and 2, R. 6, corner secs. 7, 12, 13, and 18 .....	39 38 36.9	84 13 27.6
T road west .....	39 37 43.8	84 13 32.3
Corner sections, T road east .....	39 36 46.9	84 13 37.6
Dunkard Church, crossroads at .....	39 35 48.9	84 13 42.8
T. 2, R. 4, corner secs. 8, 9, 14, and 15 .....	39 34 30.8	84 13 50.1
Springboro, crossing of pikes in north part of .....	39 33 24.0	84 13 56.8
Ts. 2 and 3, R. 4, corner secs. 7, 12, 13, and 18 .....	39 32 41.7	84 14 01.1
T. 3, R. 4, corner secs. 11, 12, 17, and 18 .....	39 31 47.0	84 14 05.9
T. 3, R. 4, corner secs. 10, 11, 16, and 17 .....	39 30 52.8	84 14 11.2
Red Lion, T. 3, R. 4, center secs. 15, at .....	39 29 28.2	84 14 55.4

This line starts from adjusted position 1 mile west of Trenton and follows public highways north along west border of quadrangle to northwest corner of same, thence east along north border, connecting with original position in West Dayton.

*Geographic positions along highways.*

Station.	Latitude.	Longitude.
Trenton, Tps. 1, 2, 2, and 3, Rs. 3 and 4, 1 mile west of ..	39 28 51.0	84 28 35.8
Tps. 2 and 3, Rs. 3 and 4, E., corner secs. 25, 30, 31, and 36 .....	39 29 43.3	84 28 36.5
Ts. 2 and 3, Rs. 3 and 4 E., corner secs. 19, 24, 25, and 30 ..	39 30 35.9	84 28 37.3
Jacksonburg, T road east 1.5 miles south of .....	39 31 00.7	84 30 14.5
Jacksonburg, crossroads at .....	38 32 19.7	84 30 07.1
T road east .....	39 33 12.2	84 29 49.5
T. 4, R. 3, quarter corner between secs. 35 and 36 .....	39 34 32.1	84 29 49.8
T. 4, R. 3, corner secs. 23, 24, 25, and 26 .....	39 35 46.7	84 29 51.6
Tps. 3 and 4, Rs. 3 and 4, quarter corner between secs. 19 and 24, T road near .....	39 36 15.6	84 28 43.4



*Geographic positions along highways—Continued.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
T road east .....	37 37 16.3	84 28 44.5
Crossing Germantown and Winchester and Farmersville and Middletown pikes.....	39 38 09.8	84 28 45.4
Tps. 3 and 4, corner secs. 1, 6, 7, and 12.....	39 38 30.4	84 28 45.8
Tps. 3 and 4, Rs. 3 and 4, corner secs. 1 and 6 (north corner)	39 39 26.2	84 28 46.6
T road east .....	39 40 39.4	84 28 47.9
Cincinnati Northern Railroad, at county line road crossing north and south .....	39 41 53.1	84 28 49.3
Tps. 4 and 5, Rs. 3 and 4, quarter corner between secs. 13 and 18.....	39 42 30.6	84 28 50.0
Crossing county line road and West Alexandria and Germantown pikes.....	39 43 23.1	84 28 51.2
Tps. 4 and 5, Rs. 3 and 4, corner secs. 1, 6, 7, and 12.....	39 43 51.2	84 28 52.0
Tps. 4, 5, 5, and 6, Rs. 3 and 4.....	39 44 42.1	84 28 53.1
T road south.....	39 44 42.7	84 27 41.7
T road north .....	39 44 43.2	84 26 44.0
T. 5, R. 4 E., corner secs. 34 and 33 (south corner).....	39 44 43.7	84 25 21.4
T. 5, R. 4 E., corner secs. 34 and 35 (south corner).....	39 44 44.4	84 24 13.7
Tps. 4 and 5, R. 4 E., corner secs. 1, 2, 35, and 36.....	39 44 44.9	84 23 05.8
Tps. 3, 4, 4 and 5, Rs. 4 and 5 E., corner secs. 1, 6, 31, and 36	39 44 45.5	84 21 58.4
Tps. 3 and 4, R. 5 E., corner secs. 5, 6, 31, and 32 .....	39 44 45.9	84 20 50.3
Tps. 3 and 4, R. 5 E., corner secs. 4 and 5 (north corner)	34 44 46.6	84 19 42.3
T. 4, R. 5 E., corner secs. 33 and 34 (south corner).....	39 44 47.2	84 18 34.0
T road north.....	39 44 47.4	84 18 00.4
Miller avenue north .....	39 44 48.0	84 16 55.2
Soldiers' Home, crossing of Eaton pike and north and south road at northeast corner of.....	39 44 58.4	84 15 10.4
West Dayton, West Third street crossing Cincinnati, Hamilton and Dayton Railroad .....	39 45 06.3	84 14 23.1

**Darke and Mercer Counties; St. Henry Quadrangle.**

This line starts from adjusted position at southwest corner of quadrangle and follows highways north to near northwest corner of quadrangle; thence east along highways to Montgomery; thence south along Cincinnati, Hamilton and Dayton Railroad and highways to adjusted position 0.5 mile east of Frenchtown.

*Geographic positions along highways.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
T. 13 N., R. 1 E., corner secs. 1, 2, 11, and 12.....	40 15 06.9	84 43 40.9
T. 14 N., R. 1 E., corner secs. 27, 28, 33, and 34.....	40 16 54.3	84 44 49.8
Tps. 13 and 14 N., R. 1 E., corner secs. 2, 3, 33, and 34..	40 16 02.0	84 44 49.0

*Geographic positions along highways—Continued.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
T. 14 N., R. 1 E., corner secs. 21, 22, 27, and 28.....	40 17 40.6	84 44 48.9
T. 14 N., R. 1 E., quarter corner between secs. 15 and 22.....	40 18 32.8	84 44 14.5
T. 14 N., R. 1 E., corner secs. 10, 11, 14, and 15.....	40 19 24.3	84 43 39.5
T. 14 N., R. 1 E., corner secs. 2, 3, 10, and 11.....	40 20 16.6	84 43 38.9
Tps. 14 and 15 N., R. 1 E., corner secs. 2, 3, 34, and 35....	40 21 08.9	84 43 38.4
Viola, crossing pike and north and south road at.....	40 22 04.4	84 42 38.8
Road southwest.....	40 22 53.2	84 42 08.0
T. 15 N., R. 1 E., quarter corner between secs. 24 and 25.....	40 22 53.6	84 43 09.4
T. 15 N., R. 1 E., quarter corner between secs. 13 and 24.....	40 23 46.7	84 43 08.6
Schoolhouse, T road south at.....	40 24 15.6	84 43 08.6
T. 7 S., R. 1 E., corner secs. 13, 14, 23, and 24.....	40 25 17.9	84 42 27.5
T. 7 S., R. 1 E., corner secs. 11, 12, 13, and 14.....	40 26 10.5	84 42 27.6
Tps. 6 and 7 S., R. 1 E., corner secs. 1, 2, 35, and 36....	40 27 55.4	84 42 27.8
T. 7 S., R. 1 E., corner secs. 1, 2, 11, and 12.....	40 27 02.9	84 42 27.8
T. 6 S., R. 1 E., corner secs. 25, 26, 35, and 36.....	40 28 47.9	43 42 27.8
T. 6 S., Rs. 1 and 2 E., corner secs. 25, 30, 31, and 36....	40 28 47.9	84 41 19.2
T. 6 S., R. 2 E., corner secs. 29, 30, 31, and 32.....	40 28 47.9	84 40 00.1
T. 6 S., R. 2 E., corner secs. 28, 29, 32, and 33.....	40 28 48.0	84 38 51.4
T. 6 S., R. 2 E., corner secs. 27, 28, 33, and 34.....	40 28 47.9	84 37 43.0
Coldwater, crossing Cincinnati Northern Railroad and Main street.....	40 28 47.9	84 37 38.5
T. 6 S., R. 2 E., corner secs. 26, 27, 34, and 35.....	40 28 48.2	84 36 34.3
Coldwater, crossroads 2 miles east of.....	40 28 52.3	84 35 25.9
Montezuma station, crossroads 1 mile west of.....	40 29 01.7	84 34 16.9
Montezuma station, road crossing Cincinnati, Hamilton and Dayton Railroad north of.....	40 29 18.0	84 33 10.1
Road crossing east and west.....	40 28 49.1	84 32 38.8
Tps. 6 and 7 S., R. 2 E., corner secs. 32, 33, 4, and 5....	40 27 56.4	84 31 53.3
Road crossing north and south.....	40 27 19.7	84 31 01.8
Road crossing north and south.....	40 26 48.1	84 30 27.5
Chickasaw, Main street crossing.....	40 26 13.7	84 29 50.2
Maria Stein station, road crossing.....	40 24 28.2	84 29 35.5
T. 7 S., R. 3 E., corner secs. 26, 27, 34, and 35.....	40 23 35.3	84 29 36.4
Tps. 7 and 8 S., R. 3 E., corner secs. 2, 3, 34, and 35....	40 22 42.7	84 29 36.6
Tps. 7 and 8 S., R. 3 E., corner secs. 2, 3, 11, and 12....	40 21 16.0	84 29 42.5
Osgood station, street crossing 75 feet south of.....	40 20 24.0	84 29 42.0
Tps. 1 and 12 N., Rs. 3 and 4 E., secs. 7, 12, 13, and 18...	40 19 31.8	84 29 42.7
Road crossing east and west near schoolhouse.....	40 18 23.2	84 29 42.1
Road crossing about 500 feet east of quarter corner be- tween secs. 25 and 30, T. 11 N., Rs. 3 and 4 E.....	40 17 30.9	84 29 37.0
T road west at center sec. 36, T. 11 N., R. 3 E.....	40 16 28.5	84 30 15.5
T. 11 N., R. 3 E., center sec. 12.....	40 14 49.5	84 30 14.2

*Geographic positions along spur line west from near northwest corner of Greenville quadrangle.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
T. 13 N., R. 1 E., quarter corner between secs. 10 and 11.	40	14	40.7	84	44	48.1
T. 13 N., R. 1 E., center sec. 9, crossroads near.....	40	14	43.2	84	46	30.6
Ohio-Indiana State line at blacksmith shop .....	40	14	45.9	84	48	16.2

*Geographic positions along spur line west from near northwest corner of St. Henry quadrangle.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
T. 6 S., R. 1 E., corner secs. 26, 27, 34, and 35 .....	40	28	47.9	84	43	36.8
T. 6 S., R. 1 E., corner secs. 27, 28, 33, and 34 .....	40	28	47.9	84	44	45.7
T. 6 S., R. 1 E., corner secs. 28, 29, 32, and 33 .....	40	28	48.0	84	45	54.2
T. 6 S., R. 1 E., corner secs. 29, 30, 31, and 32 .....	40	28	48.5	84	42	02.9
Ohio-Indiana State line near quarter corner between secs. 25 and 30, T. 6 S., Rs. 1 E. and 1 W.....	40	29	06.1	84	48	10.3

**Clark, Fayette, Greene, and Madison counties; South Charleston quadrangle.**

This line starts from adjusted position at Sedalia, follows public highways as nearly as possible along the south, west, and north borders of the South Charleston quadrangle, connecting with adjusted position at Tradersville.

*Geographic positions along highways.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
T road north.....	39	44	02.7	83	30	01.9
Y road east.....	39	43	41.5	83	31	32.1
Grasse Point church, T road north at .....	39	43	50.2	83	32	00.2
Paint Creek, center of covered bridge over.....	39	43	58.2	83	32	31.6
T road south.....	39	44	07.8	83	32	50.1
T road north.....	39	44	11.4	83	34	51.6
Thomas schoolhouse, T road south at.....	39	44	12.4	83	35	13.5
South Solon, Main street crossing Detroit Southern Rail- road.....	39	44	14.9	83	36	34.1
South Solon, crossing of Main and Washington streets ...	39	44	15.5	83	36	50.7
South Solon, T road south, 1 mile west of.....	39	44	19.6	83	38	06.5
Madison and Green counties, stone monument between..	39	44	24.4	83	39	03.7
T road southwest.....	39	44	36.7	83	39	47.9
Oakland schoolhouse, crossroads at .....	39	45	05.1	83	40	47.0

*Geographic positions along highways—Continued.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Gladstone, T road west, about 1.75 miles north of.....	39	45	59.1	83	41	47.1
Green and Clark county line, T road east, near.....	39	46	44.3	83	42	00.7
Selma, crossing of pikes at.....	39	47	11.7	83	42	31.7
Selma, Pennsylvania Railroad at street crossing.....	39	47	19.6	83	42	46.4
Selma, crossroads 0.75 mile north west of.....	39	47	47.6	83	43	15.4
T road northeast.....	39	48	26.8	83	44	06.5
Pitchin, crossroads 2 miles southeast of.....	39	49	12.2	83	44	48.4
Pitchin, crossroads at.....	39	50	34.5	83	45	45.9
Pitchin, road west about 1 mile northwest of.....	39	51	24.7	83	46	26.8
Crossing of Springfield and Selma pikes and east and west roads.....	39	52	15.8	83	46	43.9
Crossroads.....	39	52	38.0	83	45	53.9
Calvary-Cemetery, T road west at.....	39	53	02.2	83	45	16.9
T. 5, R. 9, quarter corner between secs. 14, 15.....	39	53	28.4	83	45	14.1
Locust Grove Church, road east at.....	39	53	35.9	83	45	01.4
"Big Four" Railway, overhead road crossing north and south.....	39	54	22.2	83	44	40.0
Reeds schoolhouse, crossroads at.....	39	54	45.4	83	44	33.4
T. 5, R. 9, corner secs. 10, 11, 16, 17.....	39	55	11.6	83	44	24.2
Crossing of old Columbus and Springfield road and Buck Creek lane.....	39	56	17.9	83	43	48.4
Township line crossing north and south road between secs. 7, 12, Ts. 5 and 6, R. 10.....	39	56	55.2	83	43	44.7
"Big Four" Railway at northwest and southeast road crossing, about 1.75 miles southwest of New Moorefield. Azimuth of railroad 220° 40'.....	39	58	25.9	83	43	54.3
New Moorefield station. Azimuth of railroad 220° 41'.....	39	59	17.0	83	42	57.4
"Big Four" Railway, at east and west road crossing. Azimuth of railroad 220° 41'.....	39	59	31.1	83	42	41.5
Ts. 5 and 6, R. 10, corner secs. 3, 4, 33, 34.....	39	59	27.6	83	41	41.2
Intersection of east and west road and road northwest.....	39	58	58.0	83	40	51.4
T road south.....	39	58	57.2	83	40	35.8
Bridge, west end of.....	39	59	27.1	83	39	18.0
Cemetery, T road east at.....	39	59	43.3	83	38	50.1
T. 6, R. 10, corner secs. 15, 16, 21, and 22.....	39	59	15.4	83	38	18.4
Catawba, T road west about 1 mile south of.....	39	59	12.9	83	37	32.5
Catawba, T road northeast about 1.75 miles south of.....	39	58	38.8	83	37	20.5
Pleasant Township, schoolhouse, road southeast at.....	39	58	54.4	83	36	06.6
T road northwest.....	39	59	07.4	83	35	05.8
T road southeast.....	39	59	18.0	83	34	15.6
Nation Chapel, Y road 0.25 mile northwest of.....	39	59	39.4	83	32	38.6
Clark and Madison counties, stone monument between.....	39	59	14.4	83	31	11.2

## Clark and Greene counties; Springfield quadrangle.

This line starts from New Moorefield and follows public highways along the north, west, and south borders of the quadrangle, connecting with line run by Mr. George T. Hawkins near Osborn, and tied to position 1 mile north of Gladstone post-office.

*Geographic positions along highways.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
New Moorefield, road crossing "Big Four" Railway .....	39	59	31.1	83	42	41.5
New Moorefield, T road south.....	39	59	32.5	83	43	05.5
T. 5, R. 10, corner secs. 9, 10, 15, and 16 .....	39	59	36.3	83	44	01.5
T. 5, R. 10, corner secs. 15, 16, 21, and 22.....	39	59	39.9	83	45	10.1
T. 5, R. 10, corner secs. 21, 22, 27, 28 .....	39	59	44.0	83	46	20.6
Springfield and Urbana pike, at T road east.....	39	59	50.1	83	48	02.8
T road east.....	39	58	57.7	83	48	26.9
Erie Railroad at east and west crossing, on long curve....	39	58	27.9	83	48	44.1
Mad River, T road north, near .....	39	58	41.2	83	49	50.3
Blacksmith shop, crossroads at.....	39	58	38.7	83	50	31.2
T road north .....	39	58	57.3	83	51	22.1
Lawrenceville, intersection of roads in east part of.....	39	59	08.8	83	52	09.7
T. 4, R. 10, corner secs. 20, 21, 26, and 27 .....	39	59	14.6	83	53	19.2
T. 4, R. 10, corner secs. 26, 27, 32, and 33 .....	39	59	18.8	83	54	28.2
Northampton, road southeast, 1 mile east of.....	39	59	22.0	83	55	21.4
Northampton, crossroads at .....	39	59	25.5	83	56	23.9
T. 3, R. 10, corner secs. 8, 9, 14, and 15 .....	39	59	30.5	83	57	46.6
T. 3, R. 10, corner secs. 14, 15, 20, and 21 .....	39	59	34.3	83	58	54.7
T. 3, R. 10, quarter corner between secs. 21, 22.....	39	59	36.2	83	59	28.8
T road south .....	39	59	42.7	83	59	01.8
Liberty schoolhouse, T road east, 400 feet south of.....	39	57	45.4	83	59	05.5
Liberty church, T road south, 0.5 mile west of .....	39	57	26.7	83	59	42.1
New Carlisle, T road north, 1.5 miles east of.....	39	55	52.9	83	59	50.0
T. 3, R. 10, corner secs. 21, 22, 27, and 28 .....	39	55	17.7	84	00	29.9
T. 3, R. 10, corner secs. 20, 21, 26, and 27 .....	39	54	25.2	84	00	35.6
Midway, crossing of pikes at Tecumseh Hotel .....	39	52	55.6	84	00	35.0
Mad River, T road east at .....	39	52	33.3	83	59	42.2
Erie Railroad, at north and south road crossing. Azimuth 241° 18' .....	39	51	53.1	83	59	38.6
T. 3, R. 8, corner secs. 16, 17, 22, and 23 .....	39	50	49.6	83	59	45.2
T. 3, R. 8, corner secs. 15, 16, 21, and 22 .....	39	49	56.0	83	59	51.2
T. 3, R. 8, corner secs. 14, 15, 20, and 21 .....	39	49	04.6	83	59	57.6
Crossing Xenia pike and north and south road .....	39	48	42.8	83	58	51.6
T. 3, R. 8, corner secs. 7, 8, 13, and 14 .....	39	48	07.2	83	58	54.7
Byron, road north at .....	39	47	08.5	83	59	01.0

*Geographic positions along highways—Continued.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Byron, T road north 1.5 miles south and 0.5 mile west of..	39	46	03.4	83	59	36.3
Byron, T road east, 2.5 miles south of, is near T. 3, R. 7, quarter corner between secs. 10 and 16.....	39	45	05.5	83	59	15.2
T. 3, R. 7, quarter corner between secs. 4 and 10.....	39	45	00.9	83	58	04.4
Xenia, intersection of Xenia and Fairfield pikes and road west 4 miles northwest of.....	39	44	55.7	83	56	30.4
Oldtown, Pennsylvania Railroad, at east and west crossing. T road southeast.....	39	44	38.3	83	55	49.4
Clifton and Xenia and Yellow Springs and Cedarville pikes, crossing of.....	39	45	27.2	83	53	52.2
Cory schoolhouse, T road northwest, $\frac{1}{2}$ mile southeast of..	39	46	30.6	83	52	04.4
Cory schoolhouse, T road northwest, $\frac{1}{2}$ mile southeast of..	39	45	30.1	83	51	36.1
Cedarville, T road southeast, about 2.5 miles northwest of.	39	45	46.6	83	50	45.8
Cedarville, T road northeast, 1 mile northwest of.....	39	45	02.9	83	49	28.2
Cedarville, crossing Pennsylvania Railroad at. Azimuth $235^{\circ} 24'$ .....	39	44	23.7	83	48	20.9
Schoolhouse, crossroads at.....	39	43	05.1	83	46	31.9
Schoolhouse, T road northwest, 1.25 miles northeast of...	39	43	22.4	83	45	11.3
Shiloh Academy, T road north, 0.5 mile east of.....	39	43	45.7	83	43	27.6
T road northwest.....	39	43	55.1	83	42	46.0
Gladstone, intersection pikes $\frac{1}{4}$ mile south of.....	39	44	18.5	83	41	03.3
Gladstone, intersection of roads 1 mile north of.....	39	45	17.7	83	41	15.7

**Darke and Preble counties; West Manchester quadrangle.**

This line starts from adjusted position at southeast corner of quadrangle and follows highways west along south border to southwest corner of quadrangle. Thence via highways along west border to point near northwest corner of quadrangle, thence east along "Big Four" Railway, connecting with primary traverse line of Mr. George T. Hawkins at Arcanum, and thence east on "Big Four" Railway to Pittsburg, where it connects with adjusted position.

*Geographic positions along highways.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Tps. 5 and 6, R. 3 E., corner secs. 1, 2, 35, and 36 .....	39	44	41.7	84	30	01.0
Tps. 5 and 6, R. 3 E., corner secs. 2, 3, 34, and 35 .....	39	44	41.2	84	31	09.4
West Alexandria, crossing of Dayton and Main streets...	39	44	40.9	84	31	54.5
Azimuth of Cincinnati Northern Railroad in West Alexandria is 336° 32'.						
Tps. 5 and 6, R. 3 E., corner secs. 4, 5, 32, and 33 .....	39	44	40.4	84	33	25.3
T. 8, R. 3, corner secs. 31 and 32 .....	39	44	39.9	84	34	32.8
T. 8, Rs. 2 and 3 E., corner secs. 31 and 36.....	39	44	39.4	84	35	40.1
Tps. 7 and 8, R. 3 E., corner secs. 1, 2, 35, and 36 .....	39	44	38.9	84	36	45.8
Eaton, crossing Pennsylvania Railroad and Main street, azimuth of railroad 168° 28' .....	39	44	39.0	84	37	47.4
Eaton, intersection of Main street and Richmond pike, in west part of .....	39	44	38.9	84	38	27.0
Tps. 7 and 8, R. 2 E., corner secs. 4, 5, 32, and 33 .....	39	44	38.2	84	40	08.3
Tps. 7 and 8, Rs. 1 and 2 E., corner secs. 1, 6, 31, and 36..	39	44	37.8	84	42	11.5
T. 8, R. 1 E., corner secs. 35 and 36 .....	39	44	37.8	84	43	18.8
T. 8, R. 1 E., corner secs. 23, 24, 25, and 26.....	39	46	23.4	84	43	18.6
Azimuth Pennsylvania Railroad, between these two positions, 112° 19'.						
T. 8, R. 1 E., corner secs. 13, 14, 23, and 24.....	39	47	16.8	84	43	20.1
T. 8, R. 1 E., corner secs. 11, 12, 13, and 14.....	39	48	08.9	84	43	21.4
T. 8, R. 1 E., corner secs. 1, 2, 11, and 12.....	39	49	01.1	84	43	21.5
Ebenezer, T. road south at.....	39	50	26.1	84	43	22.3
T. 9, R. 1 E., corner secs. 23, 24, 25, and 26.....	39	51	28.6	84	43	22.6
T. 9, R. 1 E., corner secs. 13, 14, 23, and 24.....	39	52	21.6	84	43	22.6
T. road, west .....	39	52	52.7	84	44	18.6
T. 9, R. 1 E., corner secs. 1, 2, 11, and 12.....	39	55	07.5	84	43	24.2
Tps. 9 and 10, R. 1 E., corner secs. 1, 2, 35, and 36 .....	39	55	00.6	84	43	24.3
New Madison, crossroads 2½ miles south of.....	39	55	50.2	84	43	22.7
T. 10, R. 1 E., corner secs. 25, 26, 35, and 36.....	39	56	45.9	84	43	21.3

*Geographic positions along the Pennsylvania Railroad.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
New Madison, road crossing 200 feet southwest of .....	39	58	08.5	84	42	41.0
Road crossing northwest and southeast .....	39	58	39.1	84	41	48.0

*Geographic positions along the "Big Four" Railway.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
T. 10, R. 2 E., corner secs. 4, 5, 8, and 9.....	39 59 23.4	84 40 17.2
Savona, crossing Cincinnati Northern Railroad.....	39 59 12.7	84 39 43.6
Road crossing north and south.....	39 59 13.0	84 39 10.1
Road crossing north and south.....	39 59 13.7	84 37 53.0
Greenville and Lewisburg pike crossing.....	39 59 14.3	84 36 48.0
Private road crossing.....	39 59 15.0	84 35 28.4
Road crossing north and south.....	39 59 15.5	84 34 35.5
Arcanum, crossing Dayton and Union Railroad.....	39 59 16.3	84 33 07.5
Road crossing north and south.....	39 59 16.8	84 32-03.7
Road crossing north and south.....	39 59 17.3	84 30 56.4

*Geographic positions along the spur line from Ebenezer west to Ohio-Indiana State line.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Ebenezer, crossing National road and north and south road 1.5 miles west of.....	39 59 19.7	84 44 47.7
Crossing National road and New Paris and Westerville pike..	39 50 08.8	84 47 35.5
Crossing National road and Ohio-Indiana State line.....	39 50 01.9	84 48 48.0

**Clinton and Warren counties, Wilmington quadrangle.**

This line, run by Mr. J. R. Ellis, starts from adjusted position at Blanchester and follows highways to southwest corner of quadrangle; thence to Westboro and via Baltimore and Ohio Southwestern Railroad to southeast corner of quadrangle; thence along highways to blind siding 4 miles northeast of Wilmington, where it connects with primary traverse by Mr. George T. Hawkins; thence along highways to northeast corner of quadrangle, and south along highways to Blanchester, where the line connects with original position.



*Geographic positions along highways.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Blanchester, Main street crossing Baltimore and Ohio Southwestern Railroad .....	39 17 31.4	83 59 14.2
Road southeast.....	39 16 54.1	83 59 43.1
Road northwest.....	39 15 51.4	84 00 09.2
Woodville, intersection of roads 0.25 mile east of .....	39 15 19.2	84 00 26.3
Pike road southeast .....	39 15 42.0	83 59 19.3
Blanchester, crossroads 2 miles southeast of.....	39 16 06.0	83 58 13.9
Road northeast .....	39 15 36.7	83 57 39.7
T. road southeast.....	39 15 58.1	83 56 37.8
Road south .....	39 16 24.6	83 55 16.7

*Geographic positions along the Baltimore and Ohio Southwestern Railroad.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Westboro station, road crossing 300 feet west of.....	39 16 51.3	83 54 38.6
Private road crossing north and south.....	39 16 35.5	83 53 48.0
Private road crossing north and south.....	35 16 17.7	83 52 45.3
Road crossing north and south.....	39 16 00.6	83 52 02.7
Klocks station, road crossing at .....	39 15 24.5	83 50 14.3
Private road crossing north and south.....	39 15 06.7	83 49 21.1
Road crossing north and south.....	39 14 35.0	83 47 45.6
Lynchburg, Main street crossing at.....	39 14 30.5	83 47 32.4
Road crossing north and south.....	39 14 08.4	83 46 28.6

*Geographic positions along highways.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
T road south.....	39 15 12.9	83 45 55.0
Highland and Clinton county line.....	39 15 49.9	83 46 59.4
Road east.....	39 16 48.6	83 46 21.8
Bridge, T road north at.....	39 17 23.2	83 45 55.6
Intersection of roads.....	39 18 22.9	83 44 45.6

*Geographic positions along the Baltimore and Ohio Southwestern Railroad.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Road crossing under trestle.....	39 19 14.8	83 45 12.8
Farmers station, Main street crossing .....	39 19 13.9	83 45 48.9

*Geographic positions along highways.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Bridge, crossroads at .....	39 20 16.3	83 45 34.3
Farmers station, crossroads 3 miles north of.....	39 21 15.4	83 45 33.9
Church, T road northeast at.....	39 21 59.0	83 46 11.0
Lane southeast.....	39 22 46.4	83 45 55.5
T road southwest.....	39 23 29.5	83 44 55.0
T road northeast.....	39 24 08.2	83 45 19.4
New Antioch, T road northeast at church in west part of..	39 24 32.0	83 44 56.0
Union schoolhouse, T road southwest near .....	39 25 53.4	83 44 11.0
T road southwest.....	39 26 31.9	83 44 53.0

*Geographic positions along Baltimore and Ohio Southwestern Railroad.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Northwest and southeast road crossing.....	39 27 41.1	83 46 11.2
Blind siding, road crossing near .....	39 27 56.2	83 45 05.3

*Geographic positions along highways.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
T road northwest .....	39 28 23.3	83 44 21.9
T road southeast.....	39 29 31.3	83 45 40.9
T road east .....	39 29 54.9	83 47 06.4
T road north.....	39 30 03.0	83 48 04.1
Intersection of roads .....	39 30 05.5	83 48 56.7
Crossroads.....	39 29 57.8	83 50 27.2
Gurneyville, crossroads 1 mile southeast of.....	39 30 24.8	83 51 29.9
Gurneyville, crossroads at .....	39 30 53.2	83 52 37.3
T road north.....	39 31 13.4	83 53 43.5

*Geographic positions along the Detroit Southern Railroad.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Private road crossing .....	39 31 14.2	83 54 28.9
Road crossing north and south .....	39 30 42.9	83 55 14.3
Kingman road crossing .....	39 29 58.9	83 56 21.7

*Geographic positions along highways.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
St. Johns Church, T road south near .....	39	29	46.9	83	58	54.6
T road west .....	39	29	08.7	83	58	56.8
Hickoryville, T road east, just south of .....	39	27	53.2	83	59	41.0
Road west .....	39	27	10.4	83	59	37.1
Vandivert crossroads .....	39	26	39.6	83	59	18.7
T road west .....	39	25	46.0	83	58	59.0
Pennsylvania Railroad at private road crossing, azimuth of railroad 60° 01' .....	39	24	25.2	83	58	37.9
Clarksville, crossing Wilmington and Cincinnati pike and Main street .....	39	24	03.3	83	58	50.6
Intersection Wilmington and Cincinnati pike and Blan- chester road .....	39	23	40.6	83	59	15.3
T road northwest .....	39	22	04.5	83	58	17.9
Crossroads .....	39	21	33.8	83	59	04.2
T road southeast .....	39	21	11.9	83	59	37.3
Blanchester crossroads, 3 miles northeast of .....	39	19	45.5	83	58	08.7
Road north .....	39	18	55.4	83	59	01.8
T road .....	39	17	53.1	83	59	32.9

**PENNSYLVANIA.****TRIANGULATION STATIONS.**

**Allegheny, Armstrong, and Westmoreland counties; Freeport and Sharpsburg quadrangles.**

In the spring of 1903, Mr. D. H. Baldwin, topographer, triangulated two 15-minute quadrangles northeast of Pittsburg. In the prosecution of this work seven new stations based upon Clearview, Rose, and Steele, were occupied. Positions are given on the United States standard datum.

**BAKERSTOWN, ALLEGHENY COUNTY.**

(Not occupied.)

A very high watertank tower near northwest corner of Richland Township, west of Bakerstown station of Pittsburg and Western Railway, used in connection with a greenhouse, and believed to be owned by Mr. Crawford.

Station mark: Center of tower.

[Latitude 40° 39' 37.60". Longitude 79° 58' 43.36".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Christy.....	285 14 59.36	105 21 26.85	4. 1611425
Heverline.....	329 52 32.42	149 54 45.02	3. 9797018

## CHRISTY, ALLEGHENY COUNTY.

On a high, bare hill in East Deer Township, about 4 miles northwest of Tarentum and Hites, on land owned by James S. Christy, whose residence is on east side of hill. There are a few large trees along road near summit south of signal and some timber on west slope.

Station mark: A marble post 36 by 6 by 6 inches, set 33 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet.

[Latitude 40° 37' 33.59". Longitude 79° 48' 48.45".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Heverline.....	64 18 52.24	244 14 37.60	4. 0090145
Bakerstown.....	105 21 26.85	285 14 59.36	4. 1611425
Shrader.....	230 12 41.89	50 18 06.21	4. 1818886
McGinnis.....	264 01 09.55	84 06 37.85	4. 0759792
Natrona.....	272 18 36.57	92 22 21.92	3. 9107096
McKelvey.....	349 21 18.82	169 22 15.55	4. 0458322

## HEVERLINE, ALLEGHENY COUNTY.

On a high, orchard-topped knob in the east border of Hampton Township, about 2 miles southeast of Talley Cavey and 2½ miles west of Dorseyville, on land owned by Mr. George Heverline, blacksmith, whose residence and shop are on west slope of hill. The orchard extends from the house up the west slope nearly to the summit.

Station mark: A marble post 33 by 6 by 6 inches, set 33 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet.

Reference marks: A peach tree 1 foot in diameter, standing alone, east of orchard, true azimuth 227°, distant 24 feet from station. A peach tree 1 foot in diameter, in edge of orchard, true azimuth 77°, distant 97 feet from station. A very small peach tree 2 inches in diameter, at corner of new orchard, true azimuth 316°, distant 61.1 feet from station.

[Latitude 40° 35' 09.94". Longitude 79° 55' 19.69%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Bakerstown.....	149 54 45.02	329 52 32.42	3.9797018
Christy.....	244 14 37.60	64 18 52.24	4.0090145
McKelvey.....	299 55 35.48	120 00 46.57	4.1137512

## INDIAN, ALLEGHENY COUNTY.

On the middle one of three conspicuous high hills about one-half mile east of Center (Trestle post-office), on land owned by Mr. Abers, whose residence is on the west side of the hill. The hilltop is stony and covered with small bushes and wild vines.

Station mark: A marble post 33 by 6 by 6 inches, set 30 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet, and around which is placed a pile of stones.

[Latitude 40° 27' 52.27". Longitude 79° 45' 15.99%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
McKelvey.....	157 11 20.53	337 09 59.19	3.8810619
McGinnis.....	199 40 42.18	19 43 51.81	4.3086642
Yeter.....	244 24 29.20	64 29 34.52	4.0890284
Clearview.....	283 39 04.24	103 42 48.02	3.9223930
Rose.....	329 46 13.40	149 48 35.89	4.0126322

## M'KELVEY, ALLEGHENY COUNTY.

At the center of high, hogback hill in Plum Township about one-fourth mile from Barking and 2 miles east of Hulton, on land owned by Mrs. John McKelvey. The hill is nearly bare, there being a few large chestnut trees just northwest of summit, and timber on west end of slope of ridge, and wild cherry and locust trees at northeast end.

Station mark: A marble post 33 by 6 by 6 inches, set 32 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet.

Reference marks: A large chestnut tree 3.1 feet in diameter, large branches cut from north side, on fence line; true azimuth 161°, distant 81 feet from station. A large chestnut tree a few feet from fence line, true azimuth 141° from station. A large chestnut tree 3 feet in diameter, on fence line, distant 179.6 feet from station.

[Latitude 40° 31' 39.50". Longitude 79° 47' 21.24".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Heverline .....	120 00 46.57	299 55 35.48	4. 1137512
Christy .....	169 22 15.55	349 21 18.82	4. 0458322
McGinnis .....	218 51 31.21	38 56 02.44	4. 1935728
Yeter .....	276 55 14.39	97 01 41.29	4. 1499159
Indian .....	337 09 59.19	157 11 20.53	3. 8810619

NATRONA, ALLEGHENY COUNTY.

(Not occupied.)

A very tall smokestack erected on the hillside overlooking Natrona, Harrison Township. The property of the Pennsylvania (?) Salt Works, chemical manufacturers.

Station mark: Center of smokestack.

[Latitude 40° 37' 22.81". Longitude 79° 43' 02.34".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Christy .....	92 22 21.92	272 18 36.57	3. 9107096
McGinnis .....	247 08 44.70	67 10 27.61	3. 6053188

SHRADER, ARMSTRONG COUNTY.

(Not occupied.)

On a bare ridge in South Buffalo Township, 3 miles northeast of Freeport, on land owned by Mr. A. C. Shrader, of Freeport.

Station mark: A sandstone post 40 by 8 by 8 inches, set 36 inches in the ground, in the center of top of which is cemented a bronze tablet marked "U. S. Geological Survey—Pennsylvania."

[Latitude 40° 42' 48.68". Longitude 79° 40' 30.80".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Christy .....	50 18 06.21	230 12 41.89	4. 1818886
McGinnis .....	358 58 12.23	178 58 16.46	3. 9288459

## CLEARVIEW, WESTMORELAND COUNTY.

In Franklin Township, about 4 miles north of Export, on high, bare, round knob owned by Joseph Cline.

Station mark: A stone post 40 by 8 by 8 inches, set 36 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet marked "U. S. Geological Survey—Pennsylvania."

Reference marks: A stone 8.1 feet north, a stone 7.3 feet south, a stone 8.5 feet west, a stone 74 feet east.

[Latitude 40° 26' 48.14". Longitude 79° 39' 31.12".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Indian .....	103 42 48.02	283 39 04.24	3.9223930
Yeter .....	202 05 16.35	22 06 37.73	3.8948211
Bush .....	224 57 11.00	45 00 25.20	3.9994467
Rose .....	23 06 19.40	203 04 58.30	3.8762981
Steel .....	249 59 21.50	70 04 30.70	4.0770516
Kepple .....	323 55 24.70	143 58 12.50	4.0157222

## M'GINNIS, WESTMORELAND COUNTY.

On a high, nearly bare knob, about 3 miles southeast of Freeport and about 2 miles west of Leechburg, on land owned by Andrew McGinnis, who lives near Markle. There is a single large locust reference tree near summit, and timber on north slope.

Station mark: A marble post 36 by 6 by 6 inches, set 35 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet.

Reference mark: A large locust tree 2.2 feet in diameter, true azimuth 292°, distant 60.47 feet from station.

[Latitude 40° 38' 13.52". Longitude 79° 40' 24.31".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Indian .....	19 43 51.81	199 40 42.18	4.3086642
McKelvey .....	38 56 02.44	218 51 31.21	4.1935728
Natrona .....	67 10 27.61	247 08 44.70	3.6053188
Christy .....	84 06 37.85	264 01 09.55	4.0759792
Shrader .....	178 58 16.46	358 58 12.23	3.9288459
Yeter .....	343 08 06.60	163 10 02.74	4.1610875

ROSE, WESTMORELAND COUNTY.

About 4 miles north of Irwin, on a cleared ridge owned by the Rose heirs.

Station mark: A stone post 40 by 8 by 8 inches, set 36 inches in the ground, in the center of top of which is cemented a bronze tablet marked "U. S. Geological Survey—Pennsylvania."

[Latitude 40° 23' 03.83". Longitude 79° 41' 36.25".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Indian .....	149 48 35.89	329 46 13.40	4. 0126322
Wiley .....	25 50 13.10	205 47 29.00	4. 1382508
Terrace.....	76 55 47.10	256 51 00.80	4. 0287096
Clearview .....	203 04 58.30	23 06 19.40	3. 8762981
Steel .....	232 08 55.20	52 15 25.40	4. 2538871
Kepple .....	279 08 53.60	99 13 02.30	3. 9625866
Altman.....	328 27 25.60	148 30 09.70	4. 0584376

STEEL, WESTMORELAND COUNTY.

About 4 miles west of Saltsburg, on the southern part of summit of high, bare hill in Bell Township, on land owned by John Steel.

Station mark: A stone post 40 by 8 by 8 inches, set 36 inches in the ground, in the center of top of which is cemented a bronze tablet marked "U. S. Geological Survey."

[Latitude 40° 29' 00.34". Longitude 79° 31' 34.73".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Indian .....	83 52 48.71	263 43 55.63	4. 2891339
Yeter .....	111 09 44.60	291 05 56.64	3. 9475188
Bush.....	125 41 21.60	305 39 26.90	3. 7093968
Kepple.....	22 23 34.00	202 21 12.90	4. 1295269
Rose .....	52 15 25.40	232 08 55.20	4. 2538871
Clearview .....	70 04 30.70	249 59 21.50	4. 0770516
Hilty .....	172 52 01.30	352 51 45.50	3. 6629986
Hood .....	227 47 34.00	47 52 51.90	4. 1913671
Marshall .....	286 33 14.00	106 37 25.00	3. 9778350

YETER, WESTMORELAND COUNTY.

On the cleared northeast end of a timbered saddleback ridge about 1½ miles south of Merwin and 3 miles north of Mamont, on land owned by Mr. Charles Yeter, whose residence is on the northeast side of the hill. It is about 9 feet east of a rail line fence, at a point 123 feet from fence corner.



Station mark: A marble post 36 by 6 by 6 inches, set 35 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet.

Reference mark: A tall, dead, line tree, 2 feet in diameter, at corner of adjacent farm, true azimuth 54°, distant 121.75 feet from station.

[Latitude 40° 30' 43.91". Longitude 79° 37' 25.75".]

To station--	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Clearview .....	22 06 37.73	202 05 16.35	3.8948211
Indian .....	64 29 34.52	244 24 29.20	4.0890284
McKelvey .....	97 01 41.29	276 55 14.39	4.1499159
McGinnis .....	163 10 02.74	343 08 06.60	4.1610875
Steele .....	291 05 56.64	111 09 44.60	3.9475188

**PRIMARY TRAVERSE.**

Berks, Chester, and Lancaster counties; Suplee quadrangle.

The following geographic positions were determined in the spring of 1904 from primary traverse by Mr. E. L. McNair, topographer. The line starts from an adjusted traverse position at Downingtown and follows highways westward and northward along border of quadrangle to Beartown triangulation station of the United States Coast and Geodetic Survey, thence northward and eastward to traverse position near Monocacy station. Positions are given on the United States standard datum.

*Geographic positions along highways.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Downingtown freight station.....	40 00 10.5	75 42 08.0
Downingtown station, 700 feet east of, stone viaduct over highway, stone arch of, tablet in coping stone of, stamped "Prim. Trav. Sta. No. 255" .....	40 00 09.8	75 42 28.9
Road north .....	40 00 38.7	75 43 13.8
Guthrieville, four corners at .....	40 01 59.1	75 45 50.5
Reeceville, road north (Manor, 2 miles) .....	40 01 40.5	75 47 46.8
Cedar Knoll station, 0.25 mile east of, four corners at blacksmith shop .....	40 01 54.5	75 49 39.6
Forks of road (Martins Corners, 2 miles; Rockville, 2 miles) .....	40 01 59.7	75 50 20.2
Martins Corners, four corners at.....	40 02 32.0	75 51 37.7
Brook crossing.....	40 02 29.3	75 52 49.8
Gottlieb Wolf's house (Sandy Hill, 2 miles), 800 feet northeast of; forks of road .....	40 02 22.8	75 53 36.0
Four corners.....	40 01 48.7	75 54 05.5
Sadsbury, road south, four miles north of.....	40 01 21.2	75 55 34.6

*Geographic positions along highways—Continued.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Compass, four corners at.....	40	01	22.6	75	56	34.0
Compass, Chester County, St. John's Church, aluminum bench mark tablet on door step of, stamped "520 ft."..	40	01	24.1	75	56	39.5
Cains post-office, four corners at.....	40	01	37.8	75	57	15.8
Road northeast.....	40	01	43.6	75	57	54.2
Pequea post-office, stream crossing, 0.25 mile east of.....	40	02	05.3	75	59	36.8
Pequea church, forks of road at corner of churchyard....	40	03	04.9	75	59.	33.5
Alert post-office, T corners, 1,800 feet east of, 150 feet north of William Hyman's house.....	40	04	20.2	75	59	08.9
Alert post-office, four corners at George Rancks, about 0.5 mile west of.....	40	03	56.4	75	59	59.6
Top of mountain, four corners near.....	40	04	37.5	76	00	51.8
Beartown triangulation station, U. S. Coast and Geodetic Survey.....	40	04	52.0	76	00	48.5
Cedar Lane, 0.8 mile south of, forks of road southeast....	40	05	38.6	76	01	16.9
Cedar Lane station, crossing Downingtown and Lancaster branch, Pennsylvania Railroad.....	40	06	22.8	76	01	28.5
Goodville, 1.5 miles south of, T corners 130 feet west of Sorrel Horse hotel.....	40	06	35.0	76	00	26.8
Goodville, corner at Sensenig Hardware Co. store.....	40	07	32.8	76	00	12.9
Goodville, four corners 1 mile northwest of.....	40	08	09.0	76	00	51.3
Conestoga Creek, near house of Peter Sander, center of iron bridge over.....	40	08	41.0	76	00	37.8
Frank Martin's house, T road at, to Churchtown, 3 miles; to Bowmansville, 4 miles.....	40	09	29.9	76	00	13.9
Samuel H. Hollinger's house, small pasture on east side of road near, bronze tablet cemented in large bowlder, in a rocky mass of bowlders, stamped "Prim. Trav. Sta." Azimuth to corner of porch of house, 218°; distance, 162 feet.....	40	09	49.4	76	00	29.7
Schoolhouse, four corners at.....	40	10	25.3	76	00	31.0
Abraham Shirk's house, road west near.....	40	11	36.4	75	59	55.2
Lancaster and Berks counties, opposite county line stone.	40	12	30.0	75	59	02.0
Bowmansville, 3 miles northeast of, Thomas Moore's house, 500 feet west of, forks of road.....	40	12	33.6	75	58	45.7
Alleghenyville, 1 mile southeast of, John Free's new storehouse, in large bowlder near fence on east side of road, 200 feet north of, bronze tablet.....	40	13	31.9	75	58	49.8
Alleghenyville, 0.75 mile southeast of, four corners.....	40	13	40.4	75	58	48.1
Albert Kramer's mill, three corners, 400 feet north of....	40	13	49.4	75	57	06.3
Plowville, 2 miles north of, road south.....	40	13	59.1	75	56	08.3
Road corners.....	40	14	18.8	75	55	15.1
Beckersville hotel and post-office, signboard at.....	40	14	02.2	75	54	31.2
Road crossing, Beckersville 0.5 mile, Gibraltar 4.5 miles..	40	14	01.2	75	53	49.4
Four corners, Beckersville 1.5 miles, White Bear 2 miles, Plowville 1 mile, Birdsboro 5 miles.....	40	13	48.9	75	53	01.8

*Geographic positions along Wilmington and Northern Railroad.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
White Bear station, east end of bridge, about 120 feet north of, aluminum tablet in south abutment of, stamped "345".....	40	13	35.0	75	51	04.9
Road crossing.....	40	13	53.9	75	50	46.9
Water tank, road crossing 580 feet south of.....	40	14	31.2	75	49	41.9
South Birdsboro flag station, road crossing 200 feet south of.....	40	15	16.6	75	48	50.2
Birdsboro station, 150 feet east of, copper bolt in top stone of east abutment, north end.....	40	15	51.6	75	48	21.6
Road crossing 0.25 mile east of milepost 47-48.....	40	15	40.0	75	47	17.1
Monocacy station, road crossing at.....	40	15	23.8	75	46	05.9

**Chester County; Coatesville quadrangle.**

The following geographic positions were determined by primary traverse, run by Mr. C. B. Kendall, field assistant, in the fall of 1903. The line begins at Thorndale, on the main line of the Pennsylvania Railroad, previously located by primary traverse, and runs westward over that railroad to Atglen, thence southward along public highways to Oxford, on the Philadelphia, Baltimore and Washington Railroad, thence eastward along railway to Avondale, thence southward along Pomeroy and Newark branch of Pennsylvania Railroad to boundary post No. 1 on the Delaware-Pennsylvania State line. Positions are given on the United States standard datum.

*Geographic positions between Thorndale and Atglen along the Pennsylvania Railroad.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Thorndale, road crossing at.....	39	59	38.5	75	45	21.0
Thorndale, 2 miles west of; road crossing, center of south track.....	39	59	17.5	75	47	27.9
Coatesville, Sixth avenue crossing, center of north track..	39	59	16.3	75	48	49.2
Brandywine Creek, road crossing at east end of bridge over.	39	59	06.7	75	49	32.4
Overhead road crossing, south rail of south track at.....	39	58	48.5	75	50	08.9
Pomeroy, 1.25 miles east of; road crossing, center of north track.....	39	58	15.2	75	52	01.2
Pomeroy, over road crossing at, south rail of south track..	39	57	56.8	75	53	23.2
Parkesburg, over road crossing at, south rail of south track..	39	57	34.9	75	55	18.3
Lenover, over road crossing at, north rail of north track..	39	57	16.8	75	56	49.4
Atglen, street crossing at, north rail of north track (references: 63.9 feet southeast to danger signal post; 50.3 feet west to mile post; 58 feet east to nail in telephone post).....	39	57	02.0	75	58	26.6

*Geographic positions along public highways between Atglen and Oxford.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Octoraro Creek, three corners at bridge over .....	39	56	34.4	75	58	18.5
Three corners, at burnt house near bridge over creek....	39	56	15.2	75	59	05.3
Three corners, road south.....	39	55	46.8	75	59	25.2
Road forks to northwest.....	39	55	28.6	75	59	49.2
Three corners, road west.....	39	54	57.7	75	59	47.2
Three corners, road east to Steelville.....	39	54	17.8	75	59	50.0
Four corners, at milepost 5 to Atglen, near schoolhouse..	39	53	24.2	75	59	49.3
Octoraro, 1 mile northeast of, forks of road.....	39	52	59.1	75	59	38.8
Octoraro, four corners at.....	39	52	16.6	76	00	18.4
Octoraro, 1.25 miles south of, north end of covered end of bridge over creek.....	39	51	09.6	76	00	35.0
Four corners.....	39	50	54.8	76	00	31.4
Three corners.....	39	50	36.3	76	00	13.2
Cream post-office, four corners at.....	39	49	53.4	76	00	09.2
Hayesville, 1 mile west of, four corners.....	39	49	11.6	75	59	19.0
Union schoolhouse, four corners at.....	39	48	46.8	75	59	16.4
Oxford, 1.5 miles northeast of, four corners.....	39	48	16.0	75	58	12.1
Oxford, junction of Market and Third streets, near Ox- ford Hotel (reference marks: 42 feet southeast to north- west corner of store; 44 feet northeast to nail in telephone pole; 26 feet west to northeast corner of horseblock)...	39	47	05.8	75	58	45.0

*Geographic positions along Philadelphia, Baltimore and Washington Railroad between Oxford and Avondale.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Oxford, 1 mile east of, road crossing.....	39	47	32.1	75	57	47.7
Road crossing, 5 feet south of south rail.....	39	47	21.3	75	56	58.6
Road crossing, 3 feet south of south rail.....	39	47	50.1	75	56	06.4
Lincoln University station, center of main track at road crossing just west of.....	39	47	58.6	75	55	21.8
Elkview station, road crossing just west of, 11 feet south of south rail.....	39	48	29.4	75	53	43.2
Kelton station, road crossing just east of.....	39	48	33.0	75	52	35.2
Overhead bridge, south rail at.....	39	48	50.5	75	51	34.5
West Grove station, road crossing just west, south rail...	39	49	19.8	75	49	38.8
Road crossing, south rail at.....	39	49	37.6	75	48	53.3
Road crossing, south rail at.....	39	49	52.5	75	48	07.4
Avondale station, street crossing just east of, 7.8 feet north of rail (reference marks: 37.3 feet to southeast corner of passenger station; 40.6 feet to southwest cor- ner of frame building, on northeast corner of street; 7.5 feet to north rail of main line).....	39	49	26.9	75	47	03.8

*Geographic positions along Pomeroy and Newark Branch of Pennsylvania Railroad between Avondale and Pennsylvania-Delaware State line.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Road crossing near water mill.....	39	48	12.0	75	46	56.9
Road crossing 150 feet from north end of trestle, 5 feet west of west rail.....	39	47	28.2	75	46	21.3
Overhead bridge, center of track under.....	39	47	05.2	75	46	26.7
Landenburg station, 250 feet south of, west rail near center of bridge over street.....	39	46	41.8	75	46	16.2
Road crossing 50 feet south of bridge, center of track.....	39	46	07.9	75	46	00.8
Yeatman station, road crossing just north of, west rail...	39	44	56.2	75	46	07.3
Pennsylvania-Delaware State line, north end of bridge...	39	44	17.8	75	46	03.0
Pennsylvania-Delaware State line, boundary post No. 1..	39	44	08.85	75	06	03.31

**Chester County; Phoenixville quadrangle.**

The following geographic positions were determined from primary traverse in 1904 by Mr. E. L. McNair, topographer. The line starts from adjusted position at Downingtown and follows the Pennsylvania Railroad to Milford Mills; thence along highways near border of quadrangle via Pottstown, Limerick, and Malvern; thence to starting point along Pennsylvania Railroad.

*Geographic positions along the Pennsylvania Railroad between Downingtown and Dorlan flag station.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Downingtown freight station.....	40	00	10.5	75	42	08.0
East Downingtown station.....	40	00	22.3	75	42	03.9
Dowlin flag station, road crossing at.....	40	02	07.6	75	42	29.1
Dorlan flag station, road crossing at.....	40	02	53.9	75	43	01.2

*Geographic positions along highways.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Milford Mills, four corners at .....	40 03 54.8	75 43 44.0
Milford Mills, covered bridge, at east end of north wing wall, bronze tablet cemented in .....	40 03 58.4	75 43 38.1
Milford, 1.5 miles northwest of, four corners .....	40 04 58.8	75 44 38.5
Fairview Presbyterian Church, four corners at .....	40 05 42.2	75 45 28.7
Fairview church, 1 mile north of, four corners .....	40 06 20.9	75 46 03.9
Marsh post-office, 2 miles southeast of, road west and pike, corner of .....	40 07 10.7	75 45 14.0
Marsh post-office, Hause's store, corner at .....	40 08 32.9	75 46 34.6
Warwick, 1 mile south of, road corners .....	40 09 10.4	75 46 35.7
Warwick station, 40 feet east of, crossing branch of Philadelphia and Reading Railway .....	40 10 02.1	75 47 03.2
Immanuel United Evangelical Church .....	40 10 55.4	75 47 05.3
Immanuel United Evangelical Church, 1 mile northeast of, forks of road .....	40 11 19.1	75 46 12.6
Hopewell Furnace, creek crossing .....	40 12 17.7	75 46 25.8
Hopewell, 1 mile north of, three corners at top of hill ...	40 12 59.4	75 46 35.0
Monocacy station, 1 mile south of, road corners .....	40 14 37.7	75 46 26.8

*Geographic positions along the Pennsylvania Railroad between Monocacy and Pottstown.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Monocacy station, canal at, bridge over, west end, north abutment of, bronze triangulation tablet .....	40 15 22.6	75 46 04.7
Douglasville, road crossing at, 3 feet south of south rail ..	40 15 17.5	75 43 38.2
Douglasville, 1.37 miles east of, road crossing .....	40 14 56.4	75 42 16.9
Pottstown, 165 feet west of station, Pennsylvania Railroad tracks, culvert under, south end of, bronze tablet ..	40 14 34.2	75 39 05.8
Pottstown, Pennsylvania Railroad station, doorsill of, copper bolt .....	40 14 33.8	75 39 03.6

*Geographic positions along highways.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
East Pottstown, four corners at .....	40 14 39.1	75 37 41.0
Sanatoga post-office, crossroads at .....	40 14 41.6	75 35 51.2
Four corners .....	40 14 37.7	75 34 26.5
St. James South Church, 0.5 mile west of four corners ...	40 14 25.8	75 32 37.4
Limerick post-office, four corners at .....	40 13 51.5	75 31 20.9

*Geographic positions along highways—Continued.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Limerick, 1 mile east of, Linderman's brick house, 600 feet east of, culvert under road, bronze tablet .....	40 13 04.7	75 30 18.8
Four corners .....	40 12 53.6	75 30 00.5
Four corners .....	40 12 25.6	75 30 28.3
Limerick station, 3 miles, road to .....	40 11 46.3	75 31 07.5
Mingo Mills .....	40 11 07.1	75 31 13.2
Rogers Ford, 2 miles east of, four corners .....	40 10 35.0	75 30 16.2
Philadelphia and Reading Railway tunnel, in road over ..	40 08 40.4	75 30 50.6
Phoenixville, Pennsylvania Railroad girder bridge over Main street, north abutment of, bench mark (127) ....	40 08 13.1	75 30 59.2
Phoenixville, Main street, south end of, road forks .....	40 07 24.9	75 30 48.1
Williams corners, 150 feet north of, four corners .....	40 06 35.1	75 30 45.0
Road southeast .....	40 05 40.1	75 30 56.8
Devault post-office, four Corners at .....	40 04 28.6	75 32 10.3
Road west .....	40 03 33.2	75 32 04.0

*Geographic positions along the Pennsylvania Railroad between Malvern and Woodbine.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Malvern post-office, crossing of Lancaster pike, culvert of Pennsylvania Railroad at, lower course, north wing, bronze triangulation tablet .....	40 02 36.6	75 31 25.1
Overhead crossing, station is between tracks .....	40 02 09.9	75 33 33.0
Glen Lock station, center of tracks opposite .....	40 01 46.3	75 35 06.3
Ship Road station, road crossing at .....	40 01 23.5	75 36 32.2
Whiteland station, opposite (north of track) .....	40 01 10.2	75 37 19.8
Whiteferd station, opposite (north of track) .....	40 00 52.9	75 38 20.8
Bradford Hills station (north of track) .....	40 00 21.9	75 39 45.8
Woodbine station (north of track) .....	40 00 19.2	75 41 07.3

**Crawford County; Linesville quadrangle.**

The following geographic positions were determined by primary traverse run by Mr. C. B. Kendall, field assistant, in the summer of 1903. The line begins at milepost 14 on the Ohio-Pennsylvania State line and runs east over highways to meridian  $80^{\circ} 15'$ , thence south to parallel  $41^{\circ} 30'$ , thence east to milepost 33 on Ohio-Pennsylvania State line. Positions are given on United States standard datum.

*Geographic positions east from milepost 14 along highways.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Milepost 14, Ohio-Pennsylvania State line .....	41	46	05.0	80	31	10.1
Milepost 14, four corners 1,000 feet south of .....	41	45	54.8	80	31	10.2
Milepost 14, 1.1 miles east of, four corners at church ....	41	45	54.3	80	29	51.1
Conneautville, 5 miles west of, four corners (at milepost) ..	41	45	46.9	80	28	10.8
Conneautville, 4 miles west of, four corners .....	41	45	47.1	80	26	59.1
Palmer, four corners at .....	41	45	38.8	80	25	45.6
Four corners .....	41	45	32.5	80	24	38.8
Conneautville, Pennsylvania Railroad crossing west of ...	41	45	37.8	80	24	09.2
Forks of road to south .....	41	45	34.9	80	23	39.6
Conneautville, junction of Main, Water, and Center streets ..	41	45	28.0	80	22	04.9
Conneautville, three corners just south of bridge over Ashtabula Creek .....	41	45	26.4	80	22	19.9
Four corners .....	41	45	16.8	80	20	59.4
Four corners .....	41	45	18.1	80	19	40.6
Three corners, road to south .....	41	45	29.9	80	17	51.2
Rundell post-office, forks of road just northwest of creamery .....	41	45	31.1	80	17	06.6
Rundell, 1 mile east of, three corners (reference marks: 36 feet southwest to nail in root of elm tree; 51 feet southeast to nail in root of elm tree; 28 feet east to nail in root of apple tree) .....	41	45	21.1	80	16	09.4

*Geographic positions southward along meridian 80° 15' between parallels 41° 45' and 41° 30' and westward to milepost 33 on the State line.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Three corners, road to west, 135 feet north of road to east ..	41	44	36.5	80	16	10.4
Norrisville, four corners at .....	41	42	56.9	80	16	13.0
Four corners .....	41	41	36.0	80	16	15.0
Four corners .....	41	40	25.3	80	16	17.2
Four corners .....	41	39	20.0	80	15	53.6
Three corners .....	41	38	16.1	80	15	39.6
Three corners .....	41	37	16.7	80	15	30.6
Birch schoolhouse, three corners at .....	41	36	52.5	80	15	05.8
Three corners .....	41	35	57.0	80	15	06.6
Geneva, 3 miles west of, three corners .....	41	35	27.7	80	14	32.4
Geneva, 1.75 miles north of, three corners .....	41	35	23.2	80	13	03.2
Geneva, Erie Railroad, crossing just east of station .....	41	34	18.6	80	13	22.0
Geneva, intersection of Main and Center streets .....	41	33	40.6	80	13	33.6
Geneva, 1 mile southwest of, four corners .....	41	32	46.2	80	14	03.2
Four corners .....	41	31	57.2	80	14	14.5



*Geographic positions southward along meridian 80° 15' between parallels 41° 45' and 41° 30' and westward to milepost 33 on the State line—Continued.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Geneva, 4 miles south of; Atlantic, 5 miles east of, four corners (reference marks: 33 feet northwest to nail in milepost; 28 feet northeast to nail in gatepost).....	41 30 23.1	80 14 17.8
Posters Corners, three corners.....	41 30 32.9	80 15 12.2
Atlantic, 2.5 miles east of, four corners at schoolhouse ...	41 30 13.1	80 17 17.0
Four corners.....	41 30 13.9	80 18 29.0
Atlantic, four corners at .....	41 30 16.8	80 20 16.7
Adamsville, 1 mile southeast of, Bessemer and Lake Erie Railroad, road crossing .....	41 30 20.1	80 21 55.5
Adamsville, four corners at .....	41 30 40.2	80 22 11.0
Adamsville, 1 mile southwest of, four corners .....	41 30 23.9	80 23 16.5
Adamsville, 1.5 miles west of, four corners.....	41 30 12.6	80 23 51.6
Four corners.....	41 30 23.6	80 25 04.7
Three corners.....	41 30 24.8	80 26 12.8
Turnersville, 2 miles northeast of, junction with State road.....	41 31 45.2	80 26 10.2
Turnersville, 0.75 mile east of four corners, 200 feet east of Pennsylvania Railroad crossing .....	41 30 55.5	80 27 50.7
Turnersville, four corners at .....	41 30 35.3	80 28 37.2
Turnersville, 1 mile southwest of, three corners .....	41 30 06.3	80 29 43.4
State line, 0.25 mile east of, three corners at brick church.	41 29 42.6	80 30 54.5
Pennsylvania-Ohio State line, milepost 33.....	41 29 34.0	80 31 09.6

### VERMONT—NEW YORK.

#### TRANGULATION STATIONS.

Chittenden County (Vt.) and Essex County (N. Y.); Burlington and Milton quadrangles.

Two quadrangles in the vicinity of Burlington were controlled by Mr. E. L. McNair, topographer, who occupied four stations and located six points by intersections.

Positions were first computed from United States Coast and Geodetic Survey stations Bigelow and Philo, but in 1904 the position given for Philo was discovered to be erroneous, thus necessitating further field work, which was done in 1904 by Mr. D. H. Baldwin, topographer, who occupied Mount Mansfield, Milton, and Yantz.

Positions are now based upon Bigelow and Mount Mansfield and checked closely upon Camels Hump and two secondary points, Juniper and Colchester Reef light-houses, all stations of the United States Coast and Geodetic Survey, United States standard datum.

BIGELOW, ESSEX COUNTY, N. Y.

A United States Coast and Geodetic Survey station on Bigelow Mountain about 4 miles south of Keeseville.

Station mark: A copper bolt sunk in solid rock with a triangle chiseled around it.

[Latitude 44° 26' 54.123". Longitude 73° 28' 09.618".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Milton .....	228 09 21	48 23 44	4. 56945
Yantz .....	275 36 22	95 53 42	4. 52181
Philo.....	312 59 12	133 09 55	4. 44248

BURLINGTON TOWER, CHITTENDEN COUNTY, VT.

(Not occupied.)

The round brick tower, situated in the city of Burlington, on top of hill, about one-half mile south of University of Vermont.

Station mark: Center of tower.

[Latitude 44° 28' 14.6". Longitude 73° 11' 51.9".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Philo.....			4. 33138
Milton .....			4. 36247
Yantz .....			4. 10898

BURLINGTON UNIVERSITY, CHITTENDEN COUNTY, VT.

(Not occupied.)

The University of Vermont, situated in the city of Burlington.

Station mark: Center of tower on main building.

[Latitude 44° 28' 40.4". Longitude 73° 11' 57.6".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Philo.....			4. 34701
Milton .....			4. 34847
Yantz .....			4. 12502

## ESSEX CENTER CHURCH, CHITTENDEN COUNTY, VT.

(Not occupied.)

The most prominent spire in the village of Essex Center.  
Station mark: Center of spire.

[Latitude 44° 30' 43.9". Longitude 73° 03' 27.0'.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Bigelow .....			4. 52536
Yantz .....			4. 01812

## ESSEX JUNCTION CHURCH, CHITTENDEN COUNTY, VT.

(Not occupied.)

The tallest and most prominent spire in the village of Essex Junction.  
Station mark: Center of spire.

[Latitude 44° 29' 30.8". Longitude 73° 06' 31.3'.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Philo .....			4. 40193
Yantz .....			3. 96664

## FORT ETHAN ALLEN, CHITTENDEN COUNTY, VT.

(Not occupied.)

Station mark: Center of stone water tower.

[Latitude 44° 30' 17.1". Longitude 73° 08' 26.9'.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Philo .....			4. 41290
Milton .....			4. 26720
Yantz .....			4. 07307

## HOLMES, CHITTENDEN COUNTY, VT.

(Not occupied.)

Situated on a bare hill in town of Westford, about 2 miles northwest of Westford post-office. Land belongs to Fred Holmes.

Station mark: A lone tree on which targets were nailed.

[Latitude 44° 37' 04.7". Longitude 73° 02' 14.6".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Yantz .....			4. 34661
Milton .....			3. 94590

## YANTZ, CHITTENDEN COUNTY, VT.

Situated on a partly cleared hill about 1½ miles southeast of village of Milliston, on land owned by Carl Yantz.

Station mark: A hole 1 inch in diameter drilled 3 inches deep in solid rock.

[Latitude 44° 25' 06.27". Longitude 73° 03' 22.74".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Bigelow .....	95 53 42	275 36 22	4. 52181
Burlington round brick tower .....			4. 10898
Burlington University of Vermont .....			4. 12502
Fort Ethan Allen .....			4. 07307
Essex Junction Church .....			3. 96664
Milton .....	169 16 37	349 13 37	4. 45527
Essex Center Church .....			4. 01812
Holmes .....			4. 34661

## MILTON, CHITTENDEN COUNTY, VT.

On summit of rocky, partially timbered mountain, locally known as Snake Hill, about 2 miles north of town of Milton.

Station mark: A bronze tablet cemented in solid rock.

[Latitude 44° 40' 14.26". Longitude 73° 07' 14.78".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Fort Ethan Allen .....			4. 26720
Philo.....	9 50 18	189 46 40	4. 64601
Burlington round brick tower.....			4. 36247
Burlington, University of Vermont.....			4. 34847
Bigelow .....	48 23 44	228 09 21	4. 56945
Holmes.....			3. 94590
Yantz .....	349 13 37	169 16 37	4. 45527

## PHILO, CHITTENDEN COUNTY, VT.

A United States Coast and Geodetic Survey secondary station located on a well-known and prominent hill 2½ miles east of North Ferrisburg. An observation tower 50 feet in height was erected in 1903 over the geodetic point.

Station mark: A copper bolt cemented in solid rock under center of tower.

[Latitude 44° 16' 41.28". Longitude 73° 12' 55.81".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Bigelow .....	133 09 55	312 59 12	4. 44248
Burlington, University of Vermont.....			4. 34701
Burlington round brick tower.....			4. 33138
Milton .....	189 46 40	9 50 18	4. 64601
Fort Ethan Allen .....			4. 41290
Essex Junction Church.....			4. 40193

## VIRGINIA.

## PRIMARY TRAVERSE.

Gloucester, King, and Queen counties; Williamsburg quadrangle.

The following geographic positions were determined from primary traverse in 1904 by Mr. C. B. Kendall, field assistant. The line starts from approximate location of Yorktown triangulation station, crosses York River, and then follows highways north and west along border of quadrangle, and is tied to position at Dudley's ferry, which was scaled from Coast and Geodetic Survey Chart No. 399.

*Geographic positions along highways.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Yorktown triangulation station of Coast and Geodetic Survey .....	37 14 09.6	76 30 28.4
Yorktown, old custom house, tablet in northeast corner of, stamped "Prim. Trav. Sta. No. 0" .....	37 14 05.7	76 30 29.0
"U S x G S"		
Gloucester Point, wharf at, post painted .....	37 14 43.6	76 30 15.9
Browns' store, crossroads at; 30 feet west to locust tree; 25 feet east to corner of fence .....	37 15 50.7	76 29 43.7
Hayes' store, three corners at; 25 feet west to front step of store; 35 feet northeast to southwest corner of porch ..	37 16 34.8	76 30 12.1
Old store, three corners at; 30 feet east to door; 40 feet southeast to northwest corner of store .....	37 17 28.3	76 30 33.9
Ordinary post-office, 50 feet north of, three corners at....	37 18 59.3	76 30 49.2
Brick church between Ordinary and Whitemarsh, southwest corner of brick wall around .....	37 19 58.6	76 30 50.1
Whitemarsh post-office, 175 feet southeast of; telephone post in angle of road forks .....	37 20 40.8	76 31 21.7
Pine tree in angle of road forks to northeast .....	37 21 34.4	76 31 27.3
Roanes post-office, 100 feet southwest of, in southeast corner of small brick potato house, opposite three corners, bronze tablet stamped "Prim. Trav. Sta. No. 56A" ..	37 22 15.7	76 30 23.8
Three corners, road to west; 40 feet northwest to cedar tree; 30 feet southwest to corner fence post .....	37 22 54.0	76 30 37.2
Three corners, road east and west; 50 feet southeast to persimmon tree; 40 feet southwest to cedar tree .....	37 23 50.8	76 30 09.9
Money post-office, 600 feet south of; road forks at store; 20 feet east to cedar tree .....	37 24 01.7	76 31 04.0
Gloucester, road junction 0.75 mile southeast of; 30 feet northeast to telephone pole; 40 feet southeast to cedar tree .....	37 24 44.4	76 31 13.9
Road fork to north (known as Indian road), 30 feet east to hickory tree .....	37 25 08.7	76 30 53.7
Four corners, 35 feet northwest to double pine; 55 feet south to leaning pine .....	37 26 07.2	76 30 52.7
Crossroad, east and west, second-class .....	37 27 13.7	76 30 46.7
Schoolhouse, 300 feet north of, road forks .....	37 27 35.1	76 30 29.8
Sawmill, second-class road to southwest, near .....	37 28 22.8	76 31 14.6
Peach Hill Run, stream crossing .....	37 28 53.9	76 31 36.2
Ebenezer Baptist Church, at forks of road; at southeast corner of foundation of church bronze tablet stamped "Prim. Trav. Sta. No. 173A" .....	37 29 57.4	76 31 50.6
Second-class crossroads northeast and southwest, 30 feet west to large oak, 35 feet south to gate .....	37 29 32.2	76 33 33.6
West side of road at forks, 30 feet to small blazed pine...	37 29 58.7	76 34 19.0
Miller & Rilie's store, road forks at, 40 feet southwest of hickory tree .....	37 30 07.8	76 35 40.2
Three corners, road to east, 25 feet west to corner of fence, 50 feet northeast to cedar tree .....	37 29 15.9	76 36 22.5

*Geographic positions along highways—Continued.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Woods crossroads, four corners at, 75 feet east to large oak tree, 40 feet northwest to cedar tree .....	37 28 41.4	76 36 59.0
Three corners, 300 feet north of old store, 25 feet west to large rock, 20 feet south to corner of fence .....	37 29 40.4	76 38 06.1
Adner post-office, 245 feet southwest of, in large chimney at dwelling of S. H. Wolffe, bronze tablet stamped "Prim. Trav. Sta. No. 265 A" .....	37 29 53.8	76 38 03.3
Gloucester, King, and Queen County line, Potopotank Creek, center of bridge over .....	37 30 03.9	76 39 10.8
Plain View, post-office, road forks, 200 feet southwest of, 25 feet southeast of, large sycamore tree .....	37 29 48.5	76 40 16.2
Vacant store, road forks to west, 25 feet west to small oak ..	37 31 32.3	76 41 11.0
Road forks, 50 feet east to pine tree, signboard, Gloucester C. H., 15 miles; Saluda, 10 miles .....	37 32 39.6	76 42 17.2
Shacklefords post-office, road forks 325 feet northeast of, 15 feet north to corner of red and white fence .....	37 33 08.2	76 43 53.2
Center of road at forks to Dudley's and Chain's ferries...	37 32 32.5	76 45 09.2
Three corners, center of road leading to the old Brooks house .....	37 31 41.2	76 46 45.7
Dudley's ferry, Brooks's residence at, set in west wall of, between two chimneys, bronze tablet stamped "Prim. Trav. Sta. No. 349" .....	37 31 47.7	76 46 49.4

**Isle of Wight and Surrey counties; Jamestown and Yorktown quadrangles.**

The following geographic positions were obtained from primary traverse in 1904 by Mr. C. B. Kendall, field assistant.

The line starts from United States Coast and Geodetic Survey triangulation station Allen, and follows highways near west and south borders of quadrangle, and is tied to the position of Rock Wharf, as given on Coast and Geodetic Survey chart No. 401a.

*Geographic positions along highways.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Allen triangulation station .....	37 13 48.09	76 57 08.74
Claremont, intersection of Moncha avenue and Bailey avenue .....	37 13 40.2	76 57 52.2
Claremont, 1 mile southeast of Southern Railway crossing.	37 13 08.0	76 58 01.6
Second class crossroad .....	37 11 48.2	76 58 12.9
Crossroads, 25 feet northwest to pine tree at northwest corner, 40 feet southeast to oak tree at southeast corner.	37 11 18.6	76 58 07.5
East and west road, 25 feet south to oak tree, 25 feet northwest to corner fence post .....	37 10 03.9	76 58 04.6

*Geographic positions along highways—Continued.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Road crossing at forks.....	37	09	21.5	76	59	21.6
Savage post-office, junction of roads at, 200 feet southwest of, iron post stamped "Prim. Trav. Sta. No. 54" ..	37	07	59.8	77	01	12.0
Road forks .....	37	06	42.9	77	01	28.5
Carsley post-office, four corners at, 20 feet southwest to fence post marked with brass tacks, 20 feet southeast to corner of porch of store.....	37	05	44.9	77	00	21.9
Crossroads, 20 feet north to pine tree, 20 feet south to blazed oak tree marked with brass tacks.....	37	05	26.6	76	59	56.9
Second class crossroads, 15 feet east to pine tree, 15 feet southwest to pine tree blazed and marked with brass tacks.....	37	04	26.8	77	00	06.2
Road east to Dendron.....	37	03	34.5	76	59	35.5
Bridge over Blackwater Creek .....	37	03	01.2	76	59	34.6
Road to south, 5 feet northwest to blazed pine, 30 feet south to pine tree at fence .....	37	02	23.1	77	00	01.9
Dun post-office, forks of road at, 10 feet east to northwest corner of Drewery's mill, 75 feet west to large pine tree.....	37	01	39.0	76	59	55.2
Crossroads, in southeast corner of, iron post stamped "Prim. Trav. Sta. No. 132".....	37	00	47.5	76	59	39.6
Three corners, 800 feet southwest of store, at forks of road, 1,025 feet west of narrow gauge railroad, 3 feet west to cedar tree, 25 feet south to sign post.....	37	01	07.8	76	58	07.2
Milltale Creek, bridge over .....	37	00	55.5	76	56	57.1
Anchor post-office, forks of road 350 feet south of, 26.12 feet west to nail in pine stump, 23.05 feet northeast to nail in root of pine tree.....	36	59	53.8	76	55	29.8
Schoolhouse, forks of road at, 70 feet south to northwest corner of school, 55 feet east to blazed pine tree in fork.....	37	00	12.7	76	54	04.4
Walls Bridge post-office, forks of road 75 feet east of, iron post in southwest corner of front yard of Mr. Mollie Wilkinson, just north of north end of bridge over Blackwater Swamp, stamped "Prim. Trav. Sta. No. 182" ....	37	01	32.4	76	52	28.2
Runnymede post-office, forks of road at, 30 feet east to mulberry tree on south edge of woods, 25 feet north to large catalpa tree on left of forks .....	37	02	11.2	76	51	06.8
Berryman post-office, center of road opposite, 16 feet east to old brick signpost, 54 feet northwest to nail in large oak .....	37	01	41.8	76	50	07.5
Stata post-office, three corners 200 feet east of, 30 feet south to fence post, 15 feet north to post.....	37	02	11.2	76.	48	37.4
Four corners, 20 feet west to signpost, 20 feet south to telephone pole.....	37	02	45.4	76	47	33.6
Second-class crossroads, 20 feet east to double pine tree, 40 feet south to pine tree .....	37	01	51.3	76	46	18.8
Road to west, 20 feet southwest to corner fence post; 25 feet northwest to signpost "Old Mill, 3 miles" "Surrey C. H. 11 mi.".....	37	01	29.4	76	45	57.9



*Geographic positions along highways—Continued.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Bobs post-office, junction of Burwell Bay and Proctor Bridge roads, with Smithfield road at, iron bench-mark post stamped "Prim. Trav. Sta. No. 242" .....	37 01 08.2	76 45 39.7
Tram road crossing, 500 feet east of church .....	37 00 53.8	76 45 05.3
Forks of road, 25 feet northwest to signpost, 30 feet south to telephone pole .....	37 00 37.9	76 40 13.2
Septa post-office, small gum tree in angle of forks of road at, 30 feet east to oak tree, 50 feet southeast to front step of post-office .....	37 00 32.0	76 41 55.3
Four corners, west corner of fence to front yard of 2-story square dwelling on north side of road.....	36 59 55.5	76 40 15.0
Pagan Creek, northwest end of bridge over.....	36 59 19.6	76 38 56.7
Smithfield, spike in center of road at junction of Main street and road to Septa, 28.9 feet southwest to nail in cedar tree, 34.5 feet southeast to nail in elm tree .....	36 58 46.7	76 38 11.7
Smithfield, bronze bench-mark tablet cemented in northeast corner of feed store, 125 feet southwest of Main and Wharf streets, stamped "Prim. Trav. Sta. 299 A" ..	36 58 58.0	76 37 49.8
Smithfield, intersection of Main and Commerce streets, 30 feet north to southeast corner of brick store, 28 feet south to northwest corner frame house on southeast side of alley .....	36 58 58.8	76 37 49.2
Road to northwest, 30 feet southwest to cedar tree, 40 feet north to gatepost.....	36 59 37.1	76 37 45.1
Forks of road at store, 30 feet south to pine tree, 35 feet northwest to gum tree in front of store .....	37 00 39.8	76 37 49.2
Four corners, 25 feet northeast to signpost, 12 feet southwest to small pine.....	37 01 39.2	76 37 57.3
Rocks Wharf, shore end of old foundation of, position as given on United States Coast and Geodetic Survey chart, No. 401a.....	37 02 07.3	76 37 26.7

**WEST VIRGINIA.****TRIANGULATION STATIONS.**

Jackson, Mason, Putnam, Roane, Tyler, Wirt, and Wood counties; Elizabeth, Millwood, New Martinsville, and Winfield quadrangles.

Triangulation control for the New Martinsville quadrangle was obtained by Mr. S. S. Gannett, geographer, and that for the other quadrangles mentioned above by Mr. D. H. Baldwin and Mr. E. L. McNair, topographers, the total number of stations located being twenty-five. Positions are given on the United States standard datum.

**BALIS, JACKSON COUNTY.**

At the highest point, near the north end of a very high, bare hog-back about 2 miles northeast of Odaville and about 1 mile southwest of Lockhart, on land owned by Mr. S. Balis, who lives in valley of the Turkey Fork, about one-half mile south of station.

Station mark: A sandstone post 36 by 9 by 9 inches set 33 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet.

Reference mark: A very tall dead tree trunk 2 feet in diameter; true azimuth from station,  $36^{\circ} 48'$ ; distance, 220.9 feet.

[Latitude  $38^{\circ} 57' 11.95''$ . Longitude  $81^{\circ} 36' 07.65''$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Reynolds .....	22 33 28.14	202 29 59.03	4.3215672
Sayre .....	44 57 53.77	224 49 37.54	4.4315279
Pleasant .....	53 21 31.55	233 16 33.80	4.1534997
Finlay .....	66 40 59.89	246 28 00.29	4.5133279
Windy .....	218 11 58.59	38 14 44.90	4.0120772
Ruble .....	255 54 05.29	76 05 30.89	4.4319366
Weed .....	295 12 30.91	115 16 15.75	3.9789552
Staats .....	317 12 31.56	137 16 22.34	4.1152546

FOSTER CHAPEL, JACKSON COUNTY.

(Unoccupied.)

Station mark: Center of belfry of Methodist Episcopal Church.

[Latitude  $38^{\circ} 45' 19.92''$ . Longitude  $81^{\circ} 46' 43.43''$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Jividen.....	33 41 30	213 38 29	4.09988
Sayre .....	127 02 15	307 00 38	3.67090

GARNES, JACKSON COUNTY.

A high knob about 1 mile west of Kenna post-office. Timber mostly cleared from summit. Land owned by Doctor Simmons estate.

Station mark: A triangular stone monument 30 inches long, base area about 48 square inches, and top area about 24 square inches, in top of which is cemented a bronze triangulation tablet.

[Latitude 38° 40' 15.33". Longitude 81° 40' 51.80".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
McKee .....	35 51 01.00	215 48 03.00	4. 06956
Honaker .....	53 19 57.28	233 13 44.04	4. 2563876
Jividen.....	86 03 20.03	265 56 39.93	4. 1908908
Sayre .....	134 59 19.65	314 54 02.71	4. 2378132
Reynolds.....	174 21 03.59	354 20 32.88	4. 0805751

## PLEASANT HILL CHURCH, JACKSON COUNTY.

The church is situated near the Ripley and Ravenswood road, about midway between those points, east of the pike, and on north side of the ridge road. It is a frame building painted white, with an 8-foot square pyramidal tower, 4 feet from the south face of the building.

Station mark: Center of square tower.

[Latitude 38° 52' 36.10". Longitude 81° 44' 01.65".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Sayre .....	35 44 40.56	215 41 21.94	4. 1169124
Finlay .....	76 31 38.26	256 23 36.68	4. 2795972
Balis.....	233 16 33.80	53 21 31.55	4. 1534997
Reynolds.....	342 37 45.47	162 39 13.72	4. 0561462

## REYNOLDS, JACKSON COUNTY.

On highest point of a cultivated knob in a young peach orchard on the south side of Millbrook Valley, 3 miles south of Ripley and 0.5 mile west of the Charleston pike. It is on land owned by Mr. A. T. Reynolds, whose house is situated on ridge in a saddle west of station and east of McCoys Knob.

Station mark: A sandstone post 36 by 9 by 9 inches set 28 inches in the ground, surrounded by a small cairn of rocks; in the center of top of post is cemented a bronze triangulation tablet.

[Latitude 38° 46' 43.85". Longitude 81° 41' 40.89%.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	<i>Meters.</i>
Sayre .....	91	15	23.79	271	10	37.22	4.0432231
Finlay .....	106	22	10.14	286	12	40.85	4.3585715
Pleasant .....	162	39	13.72	342	37	45.47	4.0561462
Balis .....	202	29	59.03	22	33	28.14	4.3215672
Staats .....	239	50	50.09	59	58	09.35	4.2908180
Garnes .....	354	20	32.88	174	21	03.59	4.0805751

SAYRE, JACKSON COUNTY.

At highest point of a very high, broad hill about 4 miles southwest of Evans, on the Point Pleasant ridge road, on land owned by Squire F. B. Sayre, who lives three-fourths mile west of Evans. Heavy timber covers portions of the west, south, and east slopes, and a peach orchard is on the north slope in adjacent field. The station is in a pasture field about 10 feet south of a rail fence, and is reached by a log road running east from Mr. King's house on ridge road.

Station mark: A sandstone post 36 by 9 by 9 inches, in the center of top of which is cemented a bronze triangulation tablet.

Reference marks: A tall isolated spruce pine tree, with branches bunched near the top, is true azimuth 13° 16' from station. The chimney of Mr. King's house is true azimuth 70° 42' from station.

[Latitude 38° 46' 51.46". Longitude 81° 49' 18.43%.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	<i>Meters.</i>
Honaker .....	5	29	25.09	185	28	28.01	4.3638018
Jividen .....	13	40	12.39	193	38	48.72	4.1362197
Kennard .....	69	44	05.15	249	34	03.69	4.3936764
Finlay .....	119	36	18.09	299	31	35.57	4.0970912
Pleasant .....	215	41	21.94	35	44	40.56	4.1169124
Balis .....	224	49	37.54	44	57	53.77	4.4315279
Reynolds .....	271	10	37.22	91	15	23.79	4.0432231
Foster .....	307	00	38.00	127	02	15.00	3.6709000
Garnes .....	314	54	02.71	134	59	19.65	4.2378132
Clarks .....	354	15	20.00	174	15	38.00	3.8312700

## CLARKS KNOB, JACKSON-MASON COUNTY LINE.

(Unoccupied.)

A pointed knob with orchard on the top.

Station mark: A lone, low, bushy tree.

[Latitude 38° 43' 12.66". Longitude 81° 48' 50.34".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Jividen.....	30 51 25	210 49 44	3. 88251
Sayre .....	174 15 38	354 15 20	3. 83127

## FINLAY, MASON COUNTY.

A high cleared ridge in Cooper district, 13 miles by road east of Point Pleasant, 1½ miles west of Chestnut post-office, on land owned by David Hart. A fine view can be had in all directions, although there are a few trees 150 yards eastward.

Station mark: A sandstone post 38 by 18 by 18 inches, set 36 inches in the ground, top dressed 8 inches square, and has a bronze triangulation tablet cemented in its center.

Reference mark: Chestnut signal tree; azimuth from station mark, 25° 53'; distance, 29 feet.

[Latitude 38° 50' 11.56". Longitude 81° 56' 49.23".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Kennard .....	39 51 27. 72	219 46 08. 18	4. 2842014
Houck .....	62 53 22. 49	242 38 56. 49	4. 5747505
Graham .....	105 26 39. 74	285 15 10. 50	4. 4386594
Leonard .....	128 32 29. 47	308 21 37. 63	4. 5039347
Greenler .....	157 19 00. 37	337 13 28. 07	4. 5174129
Melhorn.....	213 23 06. 74	33 30 24. 62	4. 4833310
Balis .....	246 28 00. 29	66 40 59. 89	4. 5133279
Pleasant.....	256 23 36. 68	76 31 38. 26	4. 2795972
Reynolds.....	286 12 40. 85	106 22 10. 14	4. 3585715
Sayre .....	299 31 35. 57	119 36 18. 09	4. 0970912
Jividen.....	338 30 15. 75	158 33 34. 19	4. 3205388

## KENNARD, MASON COUNTY.

On a cultivated hill owned by Charles Kennard, in Clendenning district, 2 miles south of Arlee post-office, 12 miles by road southeast of Gallipolis, Ohio. An unobstructed view can be had in all directions.

Station mark: A sandstone post 36 by 6 by 6 inches, set 32 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet.

Reference marks: Spike driven in top of oak stump, 7.9 feet northward. Spike driven in top of oak stump, 6.2 feet eastward.

[Latitude 38° 42' 12.28". Longitude 82° 05' 19.52".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Gebhardt.....	36 34 35.94	216 28 26.76	4. 3810159
Houck .....	83 33 45.05	263 24 39.30	4. 3270505
Finlay.....	219 46 08.18	39 51 27.72	4. 2842014
Sayre.....	249 34 03.69	69 44 05.15	4. 3936764
Jividen.....	283 07 26.69	103 16 03.77	4. 3125898
Henderson.....	317 19 20.04	137 24 30.78	4. 2495934

BLAKE KNOB, PUTNAM COUNTY.

(Not occupied.)

Station mark: Center of lone tree.

[Latitude 38° 36' 02.83". Longitude 81° 48' 47.49".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Honaker.....	44 35 16	224 34 00	3. 62495
Henderson.....	82 03 38	261 58 30	4. 08217

HENDERSON, PUTNAM COUNTY.

Situated about 3½ miles southeast of Buffalo. On a high knob, though having about same height as surrounding hills to east and southeast. Timbered on west side with second growth of timber; clear on east side. Land belongs to Mrs. Emma Henderson, of Buffalo, West Virginia.

Station mark: A sandstone block 30 by 8 by 10 inches set flush with surface of ground, in top of which is cemented a bronze triangulation tablet.

[Latitude 38° 35' 08.40". Longitude 81° 57' 01.93".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Kennard .....	137 24 30.78	317 19 20.04	4. 2495934
Jividen.....	223 33 12.06	43 36 37.88	4. 0633532
Honaker .....	278 20 20.38	98 24 12.46	3. 9592901
Blake Knob .....	261 58 30.00	82 03 38.00	4. 0821700

## HONAKER, PUTNAM COUNTY.

On a bare, pointed knob about 1 mile west of Confidence post-office. Land belongs to John Honaker.

Station mark: A sandstone post, 12 by 12 by 28 inches, set 26 inches in the ground, in top of which is cemented a bronze triangulation tablet.

[Latitude  $38^{\circ} 34' 25.41''$ . Longitude  $81^{\circ} 50' 49.77''$ .]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	''	°	'	''	Meters.
Henderson .....	98	24	12.46	278	20	20.38	3.9592901
Jividen.....	173	58	08.41	353	57	41.93	3.9895057
Sayre .....	185	28	28.01	5	29	25.09	4.3638018
Garnes .....	233	13	44.04	53	19	57.28	4.2563876
Blake Knob .....	224	34	00.00	44	35	16.00	3.6249500
McKee .....	260	27	28.00	80	30	43.00	3.8868000

## JIVIDEN, PUTNAM COUNTY.

Situated in the northern part of Putnam County, close to the Mason County line, on divide between waters of Thirteenmile Creek and Eighteenmile Creek. Land belongs to Granville Jividen, Bee post-office, whose house stands on highest part of hill, and who keeps a store on opposite side of road. The station is on north side of house.

Signal: A quadripod of poles 30 feet long.

Station mark: A sandstone block, 13 by 17 by 21 inches, set flush with surface of ground, in top of which is cemented a bronze triangulation tablet.

Reference mark: Center of sandstone post under northwest corner of house, distant 26.25 feet, azimuth  $40^{\circ} 24'$ . Center of sandstone block under northeast corner of house (L part), distant 40 feet, azimuth  $307^{\circ} 56'$ .

[Latitude  $38^{\circ} 39' 40.22''$ . Longitude  $81^{\circ} 51' 32.19''$ .]

To station.	Azimuth.			Back azimuth.			Log. distance
	°	'	''	°	'	''	Meters.
Henderson .....	43	36	37.88	223	33	12.06	4.0633532
Kennard .....	103	16	03.77	283	07	26.69	4.3125898
Finley .....	158	33	34.19	338	30	15.75	4.3205388
Sayre .....	193	38	48.72	13	40	12.39	4.1362197
Clarks Knob.....	210	49	44.00	30	51	25.00	3.8825100
Foster Chapel.....	213	38	29.00	33	41	30.00	4.0998800
Garnes .....	265	56	39.93	86	03	20.03	4.1908908
McKee .....	314	20	28.00	134	24	10.00	4.0813400
Honaker .....	353	57	41.93	173	58	08.41	3.9895057

M'KEE, PUTNAM COUNTY.

(Unoccupied.)

Situated on a high knob about one-half mile west of Center Point, or Sigman post-office, on land owned by Mr. McKee.

Station mark: A pine pole with bushy top, spiked fast to stump of tree.

[Latitude 38° 35' 06.72". Longitude 81° 45' 35.82%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Honaker .....	80 30 43	260 27 28	3. 88680
Jviden.....	134 24 10	314 20 28	4. 08134
Garnes .....	215 48 03	35 51 01	4. 06956

STAATS, ROANE COUNTY.

On the highest part of the bare, sharply rounded south knob of a double-headed mountain, the north knob of which is wooded, about 3 miles southeast of Liverpool and 1 mile northwest of Latimer, on land owned by Mr. W. T. Staats, whose house is in the valley.

Station mark: A sandstone post 36 by 9 by 9 inches set 30 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet.

[Latitude 38° 52' 01.49". Longitude 81° 30' 00.23%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Reynolds.....	59 58 09.35	239 50 50.09	4. 2908180
Balis.....	137 16 22.34	317 12 31.56	4. 1152546
Weed .....	177 35 16.45	357 35 10.40	3. 7416364
Ruble .....	227 07 48.19	47 15 22.24	4. 3750402

POLLOCK, TYLER COUNTY.

On a prominent river bluff, about 3 miles (air line) northeast of Sistersville and 2 miles south of Paden Valley, on land owned by Mrs. E. A. Pollock.

Station mark: A sandstone post 36 by 6 by 6 inches, set 32 inches in the ground, in the center of top of which is cemented a bronze tablet "W. Va."



[Latitude 39° 35' 27.78". Longitude 80° 56' 40.88".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Smith .....	33 32 15.6	213 30 35.1	3.83402
Glass .....			4.20425
High Knob .....	99 44 56.3	279 41 54.3	3.83962
Flag N .....	189 41 26.8	9 42 02.4	3.89744
Tree E .....	318 08 46.7	138 12 31.9	4.10252
Owls Head .....			4.22808

SMITH, TYLER COUNTY.

On a prominent bald knob, owned by C. E. Smith, 3 miles by road southeast of Sistersville.

Station mark: A sandstone post 36 by 6 by 6 inches, set 30 inches in the ground, in the center of top of which is cemented a bronze tablet "West Va."

[Latitude 39° 32' 23.32". Longitude 80° 59' 18.75".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Glass .....	96 56 45.4	276 51 34.5	4.06987
High Knob .....	165 02 57.6	336 01 36.3	3.87521
Flag N .....			4.15850
Pollock .....	213 30 35.1	33 32 15.6	3.83402
Owls Head .....			4.06107

TREE E, TYLER COUNTY.

(Not occupied.)

A big lone tree on bald summit of ridge, about 3 miles south of Iuka post-office.

Station mark: Center of tree.

[Latitude 39° 30' 21.82". Longitude 80° 50' 47.26".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Smith .....	107 05 53.5	287 00 28.0	4.10650
High Knob .....			4.26907
Pollock .....	138 12 31.9	318 08 46.7	4.10252

ELIZABETH, WIRT COUNTY.

The south meridian mark monument about 18 feet east of east corner of Wirt County Bank, part of the New Raleigh Hotel Building.

Station mark: A sandstone post 42 by 8 by 8 inches, sunk 36 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet.

[Latitude 39° 03' 46.28". Longitude 81° 23' 39.51".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Jephany.....	.....	.....	3. 36882

JEPHANY, WIRT COUNTY.

On a high, bare summit about 1 mile southwest of Elizabeth, on land owned formerly by Jephany Wiseman, who lives at north base of hill.

Station mark: A sandstone post 36 by 9 by 9 inches, set 30 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet.

[Latitude 39° 02' 50.94". Longitude 81° 24' 45.97".]

To station.—	Azimuth	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Weed .....	28 16 02.67	208 12 38.91	4. 2168738
Windy .....	76 43 14.56	256 38 51.71	4. 0134702
Freed .....	179 13 13.31	359 13 08.85	4. 0964350
Swearingen .....	203 08 10.39	23 11 12.48	4. 2461645
Ruble .....	291 41 08.73	111 45 25.77	4. 0240129

RUBLE, WIRT COUNTY.

On a very high, wooded knob at south end of ridge, 2.5 miles north of Burning Springs, at head of Two Run on east and Charleston Run on west, on land owned by Mr. L. C. Ruble, who lives on the north-east side of ridge. It is about one-quarter mile east of the "Ruble" log church. Locust trees cover the east side of the summit.

Station mark: A sandstone post 36 by 9 by 9 inches, set 36 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet.

[Latitude 39° 00' 44.10". Longitude 81° 17' 57.79".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Staats .....	47 15 22.24	227 07 48.19	4.3750402
Weed .....	59 01 48.11	238 54 07.75	4.3132201
Balis .....	76 05 30.89	255 54 05.29	4.4319366
Windy .....	94 29 37.09	274 20 57.36	4.2992679
Jephany.....	111 45 25.77	291 41 08.73	4.0240129
Freed .....	148 42 28.80	328 38 06.99	4.2831913

## WEED, IN WIRT, JACKSON, AND ROANE COUNTIES.

At the highest point of a cultivated knob forming the boundary corner common to Wirt, Jackson, and Roane counties, about 3 miles northeast of Liverpool, on land owned by Mr. D. W. Dougherty, whose residence, a small log house, is situated about 200 feet northeast of the station, at a slightly lower elevation. Station is about 7 feet east of fence and about 100 feet south of road. (No boundary post was found.)

Station mark: A sandstone post 36 by 9 by 9 inches set 33 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet.

[Latitude 38° 55' 00.21". Longitude 81° 30' 09.86".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Balis .....	115 16 15.75	295 12 30.91	3.9789552
Windy .....	169 30 34.12	349 29 35.35	4.0915521
Jephany.....	208 12 38.91	28 16 02.67	4.2168738
Ruble .....	238 54 07.75	59 01 48.11	4.3132201
Staats .....	357 35 10.40	177 35 16.45	3.7416364

## WILLIAMS, WIRT COUNTY.

(Not occupied.)

A small wild cherry tree on highest part of broad, bare ridge having timber on south slope. It is east of West Point schoolhouse, on land belonging to Ellis Williams.

Station mark: Center of cherry tree.

[Latitude 39° 05' 09.44". Longitude 81° 24' 41.76".]

WINDY, WIRT COUNTY.

A high, bare conical peak about 300 feet south of Windy post-office, on land owned by G. W. Boice, who lives on west side of hill.

Station mark: A sandstone post 36 by 9 by 9 inches set 30 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet.

[Latitude 39° 01' 33.90". Longitude 81° 31' 43.32%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Balis .....	38 14 44.90	218 11 58.59	4. 0120772
Goff .....	174 13 15.63	354 12 17.75	4. 3395345
Freed .....	213 31 36.92	33 35 55.63	4. 2512547
Jephany .....	256 38 51.71	76 43 14.56	4. 0134702
Ruble .....	274 20 57.36	94 29 37.09	4. 2992679
Weed .....	349 29 35.35	169 30 34.12	4. 0915521

FREED, WOOD COUNTY.

On a high, practically bare ridge 2 miles northeast of Leachtown and 4 miles northwest of Greencastle, on land owned by A. R. Freed, whose residence is on adjacent summit southwest on sand ridge about same elevation.

Station mark: A sandstone post 36 by 9 by 9 inches set 30 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet.

[Latitude 39° 09' 35.81". Longitude 81° 24' 53.05%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Windy .....	33 35 55.63	213 31 36.92	4. 2512547
Goff .....	119 46 48.89	299 41 31.67	4. 1422190
Pinnacle .....	199 10 46.34	19 12 37.23	4. 1071426
Swearingen .....	242 18 33.58	62 21 40.36	3. 9038136
Ruble .....	328 38 06.99	148 42 28.80	4. 2831913
Jephany .....	359 13 08.85	179 13 13.31	4. 0964350

## GOFF, WOOD COUNTY.

Situated on a high, cleared hill about 4 miles south of Parkersburg and one-half mile west of the Elizabeth pike, on land owned by Nathan Goff.

Station mark: A stone post 42 by 6 by 6 inches set 36 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet.

[Latitude  $39^{\circ} 13' 18.75''$ ;  $^a 39^{\circ} 13' 18.97''$ . Longitude  $81^{\circ} 33' 14.81''$ ;  $^a 81^{\circ} 33' 15.06''$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Wigal .....	69 50 00.78	249 45 17.54	4.0590737
Nolan .....	135 04 44.31	314 58 46.74	4.2822068
Nolan <sup>b</sup> .....	135 04 36.68	314 58 39.12	4.2822061
Seffens <sup>b</sup> .....	173 29 48.59	353 29 10.61	4.1032735
Pinkerton <sup>b</sup> .....	184 54 59.34	4 55 52.16	4.3666186
Pinnacle <sup>b</sup> .....	252 10 36.52	72 17 45.09	4.2319366
Pinnacle .....	252 10 30.08	72 17 38.58	4.2319171
Freed .....	299 41 31.67	119 46 48.89	4.1422190
Windy .....	354 12 17.75	175 13 15.63	4.3395345

<sup>a</sup> From Kennard-Finlay through West Virginia; triangulation of 1903.

<sup>b</sup> Calland az.

## MOUNT CARMEL CHURCH, WOOD COUNTY.

(Not occupied.)

Station mark: Center of spire on Mount Carmel frame church, on road from Greencastle to Walker station.

[Latitude  $39^{\circ} 09' 27.33''$ . Longitude  $81^{\circ} 23' 21.28''$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Goff .....	.....	.....	4.20250
Jephany .....	.....	.....	4.09316

PINNACLE, WOOD COUNTY.

Situated on the summit of a high, sharp hill, locally known as "The Pinnacle," about 2 miles northwest of Deerwalk post-office, on land owned by W. E. Whitlatch.

Station mark: A sandstone post 36 by 6 by 6 inches, set 36 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet.

Reference mark: The tall black-walnut signal tree standing a little below summit, on north side of hill. Distance to center of signal tree, 40.85 feet; true azimuth,  $250^{\circ} 00'$ .

[Latitude  $39^{\circ} 16' 07.50''$ ;  $\alpha 39^{\circ} 16' 07.74''$ . Longitude  $81^{\circ} 21' 57.37''$ ;  $\alpha 81^{\circ} 21' 57.66''$ .]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	
Goff.....	72	17	45.09	252	10	36.52	4. 2319366
Seffens.....	112	47	04.89	292	39	17.80	4. 2822967
Pinkerton.....	141	41	14.67	321	34	57.99	4. 3601976
Moore.....	204	43	50.23	24	47	56.51	4. 3462483
Griffith.....	230	06	12.40	50	10	45.31	4. 1286309
Freed.....	19	12	37.23	199	10	46.34	4. 1071426
Goff <sup>a</sup> .....	72	17	38.58	252	10	30.08	4. 2319171
Swearingen.....	340	57	45.36	160	59	01.43	3. 9469149

<sup>a</sup> From Kennard-Finlay through West Virginia; triangulation of 1903.

SWEARINGEN, WOOD COUNTY.

On a bare hogback about 4 miles east of Walker railroad station and about 1 mile south of Eatons railroad station, on land owned by A. Swearingen, who lives on the southeast side of the hill.

Station mark: A sandstone post 36 by 9 by 9 inches, set 30 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet.

Reference mark: The small pine signal tree. True azimuth from station mark,  $103^{\circ} 31'$ ; distance, 11.6 feet.

[Latitude  $39^{\circ} 11' 36.46''$ . Longitude  $81^{\circ} 19' 57.37''$ .]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	
Jephany.....	23	11	12.48	203	08	10.39	4. 2461645
Freed.....	62	21	40.36	242	18	33.58	3. 9038136
Pinnacle.....	160	59	01.43	340	57	45.36	3. 9469149

WISCONSIN.

PRIMARY TRAVERSE.

Columbia and Dodge counties; Beaverdam and Doylestown quadrangles.

The following geographic positions were obtained from primary traverse by Mr. George T. Hawkins in 1903: The line starts from United States Lake Survey triangulation station Minnesota Junction, follows highways west to Chicago, Milwaukee and St. Paul Railway; thence along that railway to Randolph; thence south along highways to Columbus; thence along Chicago, Milwaukee and St. Paul Railway to Reesville; thence along highways east to Chicago and Northwestern Railway; thence along that railway to 2 miles north of Minnesota Junction; thence west along highways to Minnesota Junction triangulation station. Positions are given on United States standard datum.

DODGE COUNTY; BEAVERDAM QUADRANGLE.

*Geographic positions along highways.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Minnesota Junction triangulation station, U. S. Lake Survey .....	43	28	28.5	88	43	46.8
T. 12 N., R. 15 E., corner secs. 29, 30, 31, and 32.....	43	28	24.4	88	44	36.6
T road west.....	43	27	58.4	88	45	31.0

*Geographic positions along the Chicago, Milwaukee and St. Paul Railway between milepost 62 and Randolph.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Milepost 62, road crossing 300 feet east of .....	43	27	58.2	88	47	48.4
Beaverdam Junction, road crossing at .....	43	28	07.7	88	49	44.2
Road crossing north and south .....	43	28	32.5	88	50	04.4
Road crossing (private) .....	43	31	27.2	88	53	21.7
T. 12 N., R. 13 E., corner secs. 1, 2, 11, and 12 .....	43	31	54.0	88	54	20.9
Road crossing northeast and southwest .....	43	32	14.4	88	57	18.0
Road crossing north and south .....	43	32	14.6	88	59	08.4
Randolph, road crossing north and south in east part of..	43	32	15.0	89	00	02.3

*Geographic positions along highways.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Creamery, crossroads at.....	43 31 00.3	89 00 00.1
T road east.....	43 29 28.7	88 59 59.2
T. 12 N., R. 13 E., quarter corner between secs. 30 and 31 .	43 28 23.5	88 59 41.6
Lost Lake, crossroads at.....	43 27 30.9	88 59 23.9
T road west.....	43 26 38.6	88 59 29.6
Creamery, crossroads at.....	43 25 46.3	88 59 40.1
Crossroads.....	43 24 10.7	88 59 59.2
Creamery, road east at.....	43 23 09.6	89 00 16.0
T road east.....	43 22 11.4	89 00 23.5

*Geographic positions along the Chicago, Milwaukee and St. Paul Railway between Columbus and Reesville.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Columbus, railway crossing east of station.....	43 20 25.6	89 00 41.4
Road crossing north and south.....	43 20 04.2	88 59 09.3
Road crossing north and south over railway.....	43 20 02.3	88 57 57.4
Ella, road crossing 500 feet east of station.....	43 19 58.4	88 56 11.5
Milepost 58, north-and-south road crossing 1,000 feet west of	43 19 18.1	88 54 39.9
Milepost 57, north-and-south road crossing 250 feet west of	43 18 44.5	88 53 31.7
Road crossing north and south over railway.....	43 18 29.0	88 52 59.1
Reesville, road crossing at.....	43 18 13.8	88 50 43.5

*Geographic positions along highways.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
T. 10 N., R. 14 E., corner secs. 22, 23, 26, and 27.....	43 18 51.4	88 48 47.1
T. 10 N., R. 14 E., corner secs. 23, 24, 25, and 26.....	43 18 50.6	88 47 35.3
T. 10 N., Rs. 14 and 15 E., corner secs. 19, 30, 25, and 24...	43 18 50.3	88 46 24.1
Graveyard, T road north at.....	43 18 49.9	88 45 19.7
T. 10 N., R. 15 E., corner secs. 20, 21, 28, and 29.....	43 18 50.3	88 44 03.7



*Geographic positions along the Chicago and Northwestern Railway between Clyman and Minnesota Junction.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Clyman, east-and-west road crossing, 0.25 mile north of..	43	18	50.4	88	43	07.7
T. 10 N., R. 15 E., corner secs. 9, 10, 15, and 16.....	43	20	33.8	88	42	49.7
Milepost 143, crossing 200 feet south of.....	43	22	04.9	88	42	26.8
T. 11 N., R. 15 E., corner secs. 27, 28, 33, and 34.....	43	23	09.8	88	42	08.9
Juneau, east-and-west road crossing north of station....	43	24	24.9	88	41	52.8
Juneau, Insane Asylum, road crossing at.....	43	24	55.4	88	41	46.1
Milepost 147, east-and-west road crossing 0.25 mile north of	43	25	47.0	88	41	39.3
Milepost 148, east-and-west road crossing 0.25 mile north of	43	26	41.3	88	41	43.1
Minnesota Junction, crossing Chicago, Milwaukee and St. Paul Railway.....	43	27	13.7	88	41	48.4
T. 12 N., R. 15 E., corner secs. 23, 24, 27, and 28.....	43	28	24.2	88	42	11.8

COLUMBIA COUNTY; DOYLESTOWN QUADRANGLE.

The following line starts from adjusted position at Columbus and follows highways southwest to Keyser, thence north and east to Chicago, Milwaukee and St. Paul Railway at Cambria, thence along railway to Randolph.

*Geographic positions along highways.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
T. 10 N., R. 12 E., corner secs. 21, 22, 27, and 28.....	43	18	43.3	89	04	07.4
T. 10 N., R. 12 E., quarter corner between secs. 20 and 29..	43	18	42.6	89	05	54.7
T. 10 N., Rs. 11 and 12 E., range line crossing east-and- west road.....	43	18	47.6	89	07	35.0
T road north.....	43	18	48.6	89	10	05.4
T road south.....	43	19	03.3	89	11	13.5
Intersection road west with road northeast and southwest..	43	18	41.8	89	13	15.0
Keyser, crossroads at.....	43	17	47.2	89	15	18.6
Crossroads.....	43	18	40.4	89	14	47.0
T. 10 N., Rs. 10 and 11 E., corner secs. 13, 18, 19, and 24..	43	19	32.4	89	14	41.1
T. 10 N., Rs. 10 and 11 E., corner secs. 7, 18, 13, and 12..	43	20	24.3	89	14	40.6
Tps. 10 and 11 N., T road south on line.....	43	22	08.6	89	14	35.6
Tps. 10 and 11 N., T road north on line.....	43	22	08.6	89	14	38.9
T. 11 N., Rs. 10 and 11 E., corner secs. 30, 31, 36, and 25..	43	23	01.5	89	14	37.1
T. 11 N., Rs. 10 and 11 E., corner secs. 19, 30, 24, and 25..	43	23	54.0	89	14	37.7
T. 11 N., Rs. 10 and 11 E., corner secs. 13, 18, 19, and 24..	43	24	46.7	89	14	38.8
T. 11 N., Rs. 10 and 11 E., corner secs. 7, 18, 13, and 12..	43	25	39.1	89	14	39.6
T. 11 N., Rs. 10 and 11 E., corner secs. 1, 6, 7, and 12....	43	26	31.4	89	14	39.9

*Geographic positions along highways—Continued.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Rio, railway crossing at.....	43 26 57.7	89 14 18.2
T. 11 N., R. 11 E., quarter corner between secs. 5 and 6..	43 26 58.0	89 13 32.0
T. 12 N., R. 11 E., corner secs. 29, 30, 31, and 32.....	43 28 16.0	89 13 33.0
T. 12 N., R. 11 E., corner secs. 7, 8, 18, and 19.....	43 29 59.0	89 13 35.0
Crossroads.....	43 30 00.9	89 12 22.0
T. 12 N., R. 11 E., sec. 15, center of.....	43 30 26.4	89 10 35.4
T. 12 N., R. 11 E., corner secs. 10, 11, 14, and 15.....	43 30 52.8	89 10 00.6
T. 12 N., R. 11 E., corner secs. 11, 12, 13, and 14.....	43 30 53.1	89 08 47.9
T. 12 N., Rs. 11 and 12 E., corner secs. 7, 18, 13, and 12..	43 30 53.1	89 07 36.2
Schoolhouse, T road west at.....	43 31 08.1	89 06 05.7

*Geographic positions along the Chicago, Milwaukee and St. Paul Railway.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Road crossing north and south.....	43 32 16.8	89 03 42.1
Road crossing north and south.....	43 32 16.0	89 02 15.8

WESTERN DIVISION OF TOPOGRAPHY.

E. M. DOUGLAS, *Geographer in charge.*

ARIZONA.

TRIANGULATION STATIONS.

Cochise, Pima, Pinal, and Santa Cruz counties; Nogales, Patagonia, Tombstone, and Tucson quadrangles.

In the spring of 1903, Mr. T. M. Bannon, topographer, extended triangulation southward from stations Grayback and Walker to the vicinity of Tombstone and Nogales. Twenty primary stations were occupied and numerous points were located by intersection for the control of six 30-minute quadrangles. Connection was made with monuments No. 120 and No. 121 of the United States and Mexico boundary line near Nogales. To reduce to mean position of latter, add 4.9" to latitude and 2.2" to longitude.

Connection was also made with San Francisco Mountain, which has also been located from the Fort Wingate, N. Mex., base and astronomic position, the latter agreeing closely with U. S. standard datum of the Coast and Geodetic Survey. To reduce Maricopa datum to Fort Wingate datum (approximate U. S. standard datum) add 4.4" to latitude, and subtract 4.8" from longitude.

AJAX, COCHISE COUNTY.

On a high hill about 4 miles west of Tombstone and about the same distance east of Fairbanks.

Station mark: A bronze tablet centered under a very large rock monument.

[Latitude 31° 42' 29.06". Longitude 110° 07' 46.78'.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Mustang.....	86 58 58.34	266 48 00.67	4.5186134
Stonewhet.....	114 13 06.71	294 03 37.16	4.4941312
Rincon.....	140 46 53.91	320 34 24.21	4.7693886

COMSTOCK, COCHISE COUNTY.

A secondary station on a low hill on west edge of Tombstone. The hill is called Comstock by some of the old settlers.

Station mark: A bronze tablet centered under a small rock monument.

[Latitude 31° 43' 05.04". Longitude 110° 04' 28.85".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Schieffelin.....	114 03 11	294 02 15	3.48187
Mineral monument No. 6.....	352 52 25	352 52 35	3.60712

MINERAL MONUMENT NO. 6, COCHISE COUNTY.

On Bunker Hill, about 1 mile south of Tombstone, being the established mineral monument No. 6.

Station mark: A 6 by 6 inch redwood post centered in a very large rock monument.

[Latitude 31° 40' 54.66". Longitude 110° 04' 09.79".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Ajax.....	116 59 02	296 57 08	3.80695
Schieffelin.....	148 04 52	328 03 46	3.79152
Comstock.....	172 52 25	352 52 35	3.60712

SCHIEFFELIN, COCHISE COUNTY.

The large tombstone erected to the memory of Ed. Schieffelin, the discoverer of Tombstone, about 3 miles west of Tombstone, on the main wagon road to Fairbanks.

Station mark: Center of the large masonry monument.

[Latitude 31° 43' 45.16". Longitude 110° 06' 14.04".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Ajax.....	46 10 00	226 09 12	3.52944
Stonewhet.....	108 42 31	288 32 12	4.51342
Comstock.....	294 02 15	114 03 11	3.48187
Mineral monument No. 6.....	328 03 46	148 04 52	3.79152

STONEWHET, COCHISE COUNTY.

On the highest peak of the Whetstone Mountains, about 15 miles southeast of Pantano railroad station, and 6 miles east of the old Total Wreck pump station, on Cienega Creek.

Station mark: A bronze tablet centered under a rock monument.

[Latitude 31° 49' 23.31". Longitude 110° 25' 48.67".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Mustang.....	17 04 38.58	197 03 09.26	4. 1823800
Baldy.....	76 20 22.14	250 07 09.15	4. 6246192
Faggan.....	105 27 10.46	285 17 46.21	4. 4645904
Rincon.....	164 55 28.62	344 52 30.54	4. 5302026
Ajax.....	294 03 37.16	114 13 06.71	4. 4941312

EMPIRE, PIMA COUNTY,

(Not occupied.)

On the highest point at the north end of the Empire Mountains, about 6 miles southwest of Pantano station on the Southern Pacific Railroad, 2 miles northeast of the old "Total Wreck mine."

Station mark: A rock monument.

[Latitude 31° 54' 56.1". Longitude 110° 36' 48.5".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Stonewhet.....	.....	.....	4. 30422
Faggan.....	.....	.....	4. 04306

FAGGAN, PIMA COUNTY.

On the round hill at the extreme north end of the Santa Rita Mountains, about 8 miles south of Vails station, and 30 miles southwest of Tucson.

Station mark: A bronze tablet centered under a large rock monument.

[Latitude 31° 53' 34.21". Longitude 110° 43' 37.69".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Baldy.....	27 40 27.13	207 36 36.59	4. 3946483
Samaniego.....	92 33 28.15	272 18 26.76	4. 6518608
Wasson.....	136 44 15.11	316 30 50.94	4. 7620535
Pusch.....	159 19 12.91	339 12 25.93	4. 7531701
Kellogg.....	181 37 56.64	1 38 30.09	4. 7608738
Rincon.....	217 30 45.62	37 37 13.95	4. 4988971
Stonewhet.....	285 17 46.21	105 27 10.46	4. 4645904
Mustang.....	313 12 35.34	133 20 29.14	4. 5118308

HOPKINS, PIMA COUNTY.

(Not occupied.)

The high sharp peak 2 miles west of Baldy Mountain, the highest peak of the Santa Rita Mountains.

Station mark: Center of peak.

[Latitude 31° 41' 15.0". Longitude 110° 53' 09.4".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Wasson .....			4. 84109
Warner .....			4. 76861
Samaniego.....			4. 58784

KELLOGG, PIMA COUNTY.

On a high timbered summit of the Santa Catalina Mountains, about 4 miles east of Mount Lemon, and 3 miles south of the Inter-Ocean (Kellogg) ranch. Most easily reached from the north via the old saw-mill road.

Station mark: A bronze tablet centered under a large rock monument.

[Latitude 32° 24' 45.42". Longitude 110° 42' 34.84".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Faggan .....	1 38 30.09	181 37 56.64	4. 7608738
Warner .....	49 48 11.97	229 39 07.03	4. 5435066
Wasson .....	69 23 00.45	249 08 56.84	4. 6443677
Black .....	149 32 09.78	329 23 56.65	4. 6719930
Rincon .....	331 42 19.13	151 48 16.72	4. 5687310

PANTANO RAILROAD STATION, PIMA COUNTY.

(Not occupied.)

Station mark: Center of the building of Pantano station, Southern Pacific Railroad.

[Latitude 31° 59' 54.9". Longitude 110° 34' 58.0".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Stonewhet .....			4. 38424
Rincon .....			4. 15838

## PUSCH, PIMA COUNTY.

On a sharp, white peak at the southwest end of the Santa Catalina Mountains, 2 miles southwest of steam pump on Pusch's ranch on the Tucson, Oracie and Mammoth road, 10 miles north of Tucson.

Station mark: A bronze tablet centered under a rock monument.

[Latitude 32° 22' 14.14". Longitude 110° 56' 22.88%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Warner .....	15 37 08.17	195 35 25.90	4.2700335
Samaniego.....	25 49 58.20	205 41 37.85	4.7536563
Wasson .....	60 50 54.56	240 44 14.27	4.3510366
Picacho .....	124 03 51.42	303 48 58.79	4.7182656
Tortolitas.....	152 21 13.23	332 18 40.41	4.2049267
Black .....	177 07 00.07	357 06 13.04	4.6550474
Rinçon .....	305 23 35.33	125 36 54.50	4.6827630
Faggan .....	339 12 25.93	159 19 12.91	4.7531701

## RINCON, PIMA COUNTY.

On the high prominent white peak of the Rincon Mountains 30 miles a little south of east from Tucson and 10 miles northeast of Vails station.

Station mark: A bronze tablet centered under a large rock monument.

[Latitude 32° 07' 05.94". Longitude 110° 31' 25.00%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Faggan .....	37 37 13.95	217 30 45.62	4.4988971
Warner .....	83 35 18.22	282 39 11.20	4.6569384
Wasson .....	106 18 02.24	285 58 05.16	4.7871876
Pusch .....	125 36 54.50	305 23 35.33	4.6827630
Kellogg .....	151 48 16.72	331 42 19.13	4.5687310
Ajax .....	320 34 24.21	140 46 53.91	4.7693886
Stonewhet.....	344 52 30.54	164 55 28.62	4.5302026

## SAMANIEGO, PIMA COUNTY.

On Samaniego Peak in the Sierrita Mountains, about 2 miles north of McGee's cattle ranch and 30 miles southwest of Tucson.

Station mark: A bronze tablet centered under a rock monument.

[Latitude 31° 54' 36.03". Longitude 111° 12' 03.38".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Wasson .....	187 07 29.71	7 09 11.52	4. 6067648
Pusch .....	205 41 37.85	25 49 58.20	4. 7536563
Warner .....	210 36 40.03	30 43 17.63	4. 5857330
Faggan .....	272 18 26.76	92 33 28.15	4. 6518608
Baldy .....	305 30 32.37	125 41 40.65	4. 6130612
Cayetano .....	331 38 15.31	151 45 45.76	4. 6773982

## SAN XAVIER MISSION, PIMA COUNTY.

(Not occupied.)

Station mark: The highest dome of the old San Xavier Mission, 11 miles south of Tucson.

[Latitude 32° 06' 20.1". Longitude 111° 00' 31.1".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Samaniego.....			4. 45166
Wasson .....			4. 35458

## SONOITA SECTION HOUSE, PIMA COUNTY.

(Not occupied.)

The two-story section-house building at Sonoita station on the Nogales Branch of the Southern Pacific Railroad.

[Latitude 31° 40' 24.1". Longitude 110° 39' 18.4".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Baldy .....			4. 26729
Stonewhet.....			4. 43165

## TORTOLLITAS, PIMA COUNTY.

On a high peak at the southeast end of the Tortollitas Mountains, 8 miles northeast of Pusch's ranch (steam pump), on the Tucson, Oracle and Mammoth road.

Station mark: A bronze tablet centered under a rock monument.



[Latitude 32° 29' 55.04". Longitude 111° 01' 07.80%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Wasson .....	25 46 43.96	205 42 35.48	4.4458903
Picacho .....	112 45 42.20	292 33 21.38	4.5900081
Black .....	189 26 10.71	9 27 57.27	4.4964023
Pusch .....	332 18 40.41	152 21 13.23	4.2049267

## TUCSON COURT-HOUSE, PIMA COUNTY.

(Not occupied.)

Station mark: Center of cupola.

[Latitude 32° 13' 17.3". Longitude 110° 58' 25.1%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Pusch .....			4.22640
Warner .....			3.35984

## TUCSON, SOUTH MERIDIAN STATION, PIMA COUNTY.

A secondary triangulation station in the southwest corner of the grounds of the University of Arizona, 108.5 feet from the west fence, and 157.4 feet from the south fence.

Station mark: A dark stone post, 60 by 7 by 7 inches, set 57 inches in the ground, in the center of top of which is cemented a copper bolt.

[Latitude 32° 13' 44.82". Longitude 110° 57' 24.96%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Warner .....	56 26 51	236 25 42	3.60912
Wasson .....	104 48 54	284 42 47	4.26932
North Meridian .....	180 00 39	0 00 39	2.45133

## TUCSON STANDPIPE, PIMA COUNTY.

(Not occupied.)

Station mark: Center of standpipe.

[Latitude 32° 12' 39.0". Longitude 110° 58' 00.1".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Pusch .....			4. 25281
Wasson .....			4. 26372
Warner .....			3. 39424

## VAILS, PIMA COUNTY.

(Not occupied.)

The railroad station building at Vails, Southern Pacific Railroad.

[Latitude 32° 02' 47.6". Longitude 110° 42' 46.1".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Faggan .....			4. 23297
Kellogg .....			4. 60780
Rincon .....			4. 29122

## WARNER, PIMA COUNTY.

On a round black malpais hill known as Warner Hill, about one-half mile west of Tucson.

Station mark: A bronze tablet centered under a very large rock monument.

[Latitude 32° 12' 31.86". Longitude 110° 59' 34.33".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Samaniego .....	30 43 17.63	210 36 40.03	4. 5857330
Wasson .....	115 37 17.13	295 32 19.77	4. 2089442
Pusch .....	195 35 25.90	15 37 08.17	4. 2700335
Kellogg .....	229 39 07.03	49 48 11.97	4. 5435066
Rincon .....	282 39 11.20	83 35 18.22	4. 6569384

## WASSON, PIMA COUNTY.

On the highest peak, known as Mount Wasson, of the Tucson Range, about 12 miles west of Tucson.

Station mark: A bronze tablet buried about 1 foot under ground, over which is centered a 6 by 6 inch redwood mineral monument post, around which is built a large rock monument.

[Latitude 32° 16' 18.64". Longitude 111° 08' 51.74".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Samaniego.....	7 09 11.52	187 07 29.71	4. 6067648
Picacho.....	149 22 06.89	329 13 57.31	4. 6690990
Black.....	197 03 38.12	17 09 33.79	4. 7684935
Tortollitas.....	205 42 35.48	25 46 43.96	4. 4458903
Pusch.....	240 44 14.27	60 50 54.66	4. 3510366
Kellogg.....	249 08 56.84	69 23 00.25	4. 6443677
Rincon.....	285 58 05.16	106 18 02.24	4. 7871876
Warner.....	295 32 19.77	115 37 17.13	4. 2089442
Faggan.....	316 30 50.94	136 44 15.11	4. 7620535

RICE, PIMA AND PINAL COUNTIES.

(Not occupied.)

High round peak on the Crocle ridge of the Santa Catalina Mountains, about 12 miles south of Oracle health resort. A county-line monument between Pima and Pinal counties is a few feet from the station.

Station mark: A rock monument.

[Latitude 32° 30' 38.5". Longitude 110° 45' 02.1".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Tortollitas.....			4. 40215
Black Mountain.....			4. 55306
Kellogg.....			4. 06209

BLACK, PINAL COUNTY.

On the highest peak of the low mountain, known both as the Cottonwood Mountains and as Black Mountains, about 35 miles south of east from Florence and 9 miles south of Burns's Cottonwood ranch. The Florence and Mammoth road passes several miles to the north.

Station mark: A bronze tablet centered under a very large rock monument.

[Latitude  $32^{\circ} 46' 39.32''$ . Longitude  $110^{\circ} 57' 50.23''$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Tortollitas .....	9 27 57.27	189 26 10.71	4.4964023
Wasson .....	17 09 33.79	197 03 38.12	4.7684935
Picacho .....	68 51 35.00	248 37 24.60	4.6433106
Walker .....	121 44 11.48	301 26 12.80	4.7820429
Grayback .....	159 06 33.58	339 02 09.38	4.5484595
Pusch .....	357 06 13.04	177 07 00.07	4.6550474
Kellogg .....	329 23 56.65	149 32 09.78	4.6119930

## PICACHO, PINAL COUNTY.

On the high prominent peak named Picacho, 1 mile south of Wynola siding on the Southern Pacific Railroad, 8 miles west of Red Rock station.

Station mark: A bronze bench-mark tablet centered under a large rock monument.

[Latitude  $32^{\circ} 38' 01.60''$ . Longitude  $110^{\circ} 24' 04.10''$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Walker .....	167 23 37.17	347 19 54.28	4.6887917
Grayback .....	209 55 43.08	30 05 33.23	4.7524589
Black .....	248 37 24.60	68 51 35.00	4.6433106
Tortollitas .....	292 33 21.38	112 45 42.20	4.5900081
Pusch .....	303 48 58.79	124 03 51.42	4.7182656
Wasson .....	329 13 57.31	149 22 06.89	4.6690990

## BALDY, SANTA CRUZ COUNTY.

On the high prominent peak known as Baldy, in the Santa Rita Mountains, about 35 miles southeast of Tucson, visible from all directions.

Station mark: A bronze tablet centered under a large rock monument.

[Latitude 31° 41' 40.59". Longitude 110° 50' 55.26".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Santa .....	3 54 56.06	183 54 05.82	4. 5704004
Benedict .....	12 04 19.21	192 01 58.42	4. 5314281
Cayetano .....	31 05 08.40	211 01 32.75	4. 3226362
Samaniego.....	125 41 40.65	305 30 32.37	4. 6130612
Faggan .....	207 36 36.59	27 40 27.13	4. 3946483
Stonewhet .....	250 07 09.15	70 20 22.14	4. 6246192
Mustang.....	270 23 08.91	90 34 51.29	4. 5466564

## BENEDICT, SANTA CRUZ COUNTY.

On the highest round hill, about 5 miles south of Calabasas and 4 miles north of Nogales, between the Santa Cruz River and Nogales Creek.

Station mark: A bronze tablet centered under a large rock monument.

[Latitude 31° 23' 41.10". Longitude 110° 55' 24.37".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Cayetano .....	166 09 49.22	346 08 34.95	4. 1957829
Baldy .....	192 01 58.42	12 04 19.21	4. 5314281
Santa .....	310 07 05.57	130 08 35.66	3. 7767067

## CAYETANO, SANTA CRUZ COUNTY.

On the highest peak of the Cayetano Mountains, 4 miles north of Calabasas and about 15 miles north of Nogales.

Station mark: A bronze tablet centered under a rock monument.

[Latitude 31° 31' 55.92". Longitude 110° 57' 46.66".]

To station—	Azimuth.	Black azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Samaniego.....	151 45 45.76	331 38 15.31	4. 6773982
Baldy .....	211 01 32.75	31 05 08.40	4. 3226362
Mustang.....	248 51 00.95	69 06 17.36	4. 6934490
Benedict .....	346 08 34.95	166 09 49.22	4. 1957829

## MONUMENT NO. 121, SANTA CRUZ COUNTY.

International boundary line monument No. 121.

Station mark: Center of the large iron boundary monument.

[Latitude  $31^{\circ} 19' 52.23''$ ;  $31^{\circ} 19' 57.13''$ . Longitude  $110^{\circ} 56' 22.58''$ ;  $110^{\circ} 56' 24.78''$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Benedict .....	192 18 25	12 18 56	3. 8582241
Santa .....	242 23 24	62 25 25	3. 8386500

a Mean position by United States and Mexico Boundary Survey Report, p. 54.

## MUSTANG, SANTA CRUZ COUNTY.

On the second hill from the south of the hills known as the Mustangs, 2 miles north of Elgin station, on the Nogales Branch of the Southern Pacific Railroad.

Station mark: A bronze tablet centered under a rock monument.

[Latitude  $31^{\circ} 41' 30.95''$ . Longitude  $110^{\circ} 28' 38.37''$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Cayetano .....	69 06 17.36	248 51 00.95	4. 6934490
Baldy .....	90 34 51.29	270 23 08.91	4. 5466564
Faggan .....	133 20 29.14	313 12 35.34	4. 5118308
Stonewhet .....	197 03 09.26	17 04 38.58	4. 1823800
Ajax .....	266 48 00.67	86 58 58.34	4. 5186134

## RED, SANTA CRUZ COUNTY.

(Not occupied.)

On the high mountain 3 miles southeast of Patagonia station, on the Nogales Branch of the Southern Pacific Railroad.

Station mark: A bronze tablet set in solid rock under a small monument.

[Latitude  $31^{\circ} 30' 18.1''$ . Longitude  $110^{\circ} 43' 35.8''$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Benedict .....	56 53 03	236 46 53	4. 349256
Baldy .....	151 10 26	331 06 36	4. 380230

## SANTA, SANTA CRUZ COUNTY.

On a white grassy ridge on the west side of Santa Cruz River and about 4 miles northeast of Nogales.

Station mark: A bronze tablet centered under a rock monument.

[Latitude 31° 21' 35.96". Longitude 110° 52' 31.34".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Monument 121 .....	62 25 24.00	242 23 27.00	3. 8386500
Benedict .....	130 08 35.66	310 07 05.57	3. 7767067
Baldy .....	183 54 05.82	3 54 56.06	4. 5704004

## WASHINGTON, SANTA CRUZ COUNTY.

(Not occupied.)

On a high timbered hill about 1½ miles north of the Mexican boundary line and 13 miles east of Nogales.

Station mark: A rock monument.

[Latitude 31° 21' 07.1". Longitude 110° 43' 33.8".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Benedict .....	104 13 34	284 07 24	4. 287074
Baldy .....	162 59 11	342 55 20	4. 599195

## Coconino and Mohave counties; Grand Canyon Forest Reserve.

During the summer of 1903 Mr. J. T. Stewart controlled, by triangulation, seven 15-minute quadrangles lying within this reserve, the work being based upon stations Floyd and Kendrick developed from the Maricopa base. In the prosecution of this work Mr. Stewart occupied twenty-seven primary and five 3-point stations.

## APACHE, COCONINO COUNTY.

On the northernmost point of the Apache headland; as it was covered with cedar and pinyon timber, a great deal of cutting was necessary. Station was cleared for all points north. Sight lanes were cut to Chapin and Oliver signals. Station can be reached with saddle horses from Bass-Supai wagon road.

Signal: A pole tripod 12 feet high centered over tablet.

Station mark: A bronze triangulation tablet cemented in a limestone rock.

[Latitude 36° 12' 45.02". Longitude 112° 30' 03.89".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Chapin .....	10 43 50.26	190 43 12.83	3. 9301718
Oliver .....	63 11 33.20	243 08 22.71	3. 9557725
Elliott .....	109 23 25.03	288 18 45.94	4. 0968329
Fossil .....	155 08 24.32	335 06 12.81	4. 1202820
Millett .....	193 17 58.36	13 20 15.65	4. 3996208
Sublime .....	274 14 43.60	94 23 35.22	4. 3531054
Bass .....	290 22 28.95	110 27 33.65	4. 1385497

## BASS, COCONINO COUNTY.

On high point of plateau, 1 mile east of Bass camp. The point was covered with small timber, but was cleared so that sights can be had in all directions. Station is 300 feet south of the wagon road which runs from Bass camp to Havasupai Point.

Signal: A pole tripod 13 feet high and 9 feet at the base.

Station mark: A bronze triangulation tablet cemented in a flat limestone ledge.

[Latitude 36° 10' 09.31". Longitude 112° 21' 27.85".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Floyd .....	21 08 51.88	200 55 59.30	4. 9658682
Cataract .....	53 20 19.10	233 13 27.96	4. 3378082
Chapin .....	76 12 53.16	256 07 11.32	4. 1736931
Apache .....	110 27 33.65	290 22 28.95	4. 1385497
Sublime .....	252 03 26.26	72 07 12.97	4. 0036308
Royal .....	278 59 58.91	99 14 26.13	4. 5709072
Rowe .....	300 22 03.79	120 29 15.05	4. 3266836
Red Butte .....	328 04 46.78	148 14 12.70	4. 6600887

## CANE, COCONINO COUNTY.

On east bank of North Canyon Wash, 4 miles southeast of Cane Springs. This station can be reached from Cane Springs by wagon road and is near the north line of the Grand Canyon Forest Reserve.

Station mark: A bronze triangulation tablet cemented in rock under center of a cairn 6½ feet high and 6 feet in diameter at base.



[Latitude 36° 31' 43.92". Longitude 111° 56' 36.37".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Saddle .....	1 29 03.94	181 28 49.02	4.3838093
North Canyon .....	48 57 37.79	228 54 00.26	4.0819001
Shinumo .....	297 42 07.86	117 50 14.73	4.3624460

CARDENAS, COCONINO COUNTY.

On a knoll one-half mile east of the mouth of the Little Colorado River and one-fourth mile north of the Canyon rim. Country is cleared of timber, and station can be reached by wagon from Willow Springs.

Station mark: A bronze triangulation tablet cemented in solid rock under center of a cairn 6 feet high and 6 feet in diameter.

[Latitude 36° 13' 04.15". Longitude 111° 46' 39.66".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Comanche .....	9 44 19.47	189 43 22.94	4.1514199
Final .....	54 09 04.56	234 04 26.74	4.1618480
Saddle .....	123 40 39.04	303 34 31.21	4.2704914
Shinumo .....	193 05 56.64	13 08 08.24	4.3877147
Desert .....	236 19 07.87	56 23 51.71	4.1581709

CATARACT, COCONINO COUNTY.

On the north rim of Cataract Canyon, about 10 miles south of the Bass and Supai road. Station can be reached with saddle horses from Bass and Supai or Bass and Ash Fork road.

Station mark: A bronze tablet cemented in a limestone rock under center of a cairn built of rock and earth 6 feet high and 8 feet in diameter at bottom and 6 feet at top.

[Latitude 36° 03' 07.06". Longitude 112° 33' 05.48".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Floyd .....	12 07 48.67	192 01 44.45	4.8746164
Supai .....	128 46 52.24	308 41 56.74	4.2064305
Oliver .....	165 36 58.18	345 35 35.08	4.1517421
Chapin .....	197 21 59.31	17 23 08.94	3.9956194
Bass .....	233 13 27.96	53 20 19.10	4.3378082
Red Butte .....	301 40 46.75	121 57 01.30	4.6900568

## CHAPIN, COCONINO COUNTY.

On a prominent ridge about 3 miles south of the Bass and Supai road, and 5 miles east of Cataract Creek. Ridge had been timbered and burnt over and some cutting was necessary to clear it. It can be reached with saddle horses from Bass and Supai road.

Signal: A pole tripod 12 feet high centered over tablet.

Station mark: A bronze tablet cemented in limestone rock.

[Latitude 36° 08' 13.59". Longitude 112° 31' 07.31".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Cataract.....	17 23 08.94	197 21 59.31	3.9956194
Supai.....	92 20 07.68	272 14 02.19	4.1905212
Oliver.....	123 31 44.28	303 29 11.33	3.8903789
Elliott.....	140 47 57.81	320 43 56.42	4.2081040
Apache.....	190 43 12.83	10 43 50.26	3.9301718
Bass.....	256 07 11.32	76 12 53.16	4.1736931

## COCONINO, COCONINO COUNTY.

On Coconino Point, a rocky conical point on the north side of Coconino Ridge, near the point where the Little Colorado River leaves the foot of the Coconino Ridge and runs northerly. The point was covered with scrub piñon and cedar timber, but was cleared sufficiently for sights to all signal points. Station can be reached by pack train from Red Horse or Halls tank; also from the east.

Station mark: A bronze triangulation tablet cemented in a limestone boulder under center of cairn 6 feet high and 6 feet in diameter.

[Latitude 35° 55' 37.93". Longitude 111° 40' 37.15".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Kendrick.....	15 21 26.53	195 15 20.27	4.7770728
Hollenbeck.....	121 29 09.93	301 22 08.30	4.3237168
Royal.....	130 34 04.88	310 24 28.37	4.5088644
Comanche.....	147 54 39.85	327 50 10.39	4.3341223
Desert.....	184 10 07.44	4 11 16.69	4.6056022

## COMANCHE, COCONINO COUNTY.

On Comanche Point, the most prominent peak on the east rim of the Great Canyon, 7 miles south of the mouth of the Little Colorado River. The peak is covered with scattering piñon timber, and some

cutting was done near the station. A wagon road runs within 2 miles and saddle horses can be taken nearly to station.

Station mark: A bronze triangulation tablet cemented in limestone rock and stamped "7074 A," under the center of a cairn 6 feet at base and 5½ feet high.

[Latitude 36° 05' 30.98". Longitude 111° 48' 15.48%.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	<i>Meters.</i>
Hollenbeck .....	41	42	10.42	221	39	37.74	3.9895506
Royal .....	101	37	48.09	281	32	40.50	4.1247756
Final .....	120	14	41.09	300	11	00.17	4.0353079
Cardenas .....	189	43	22.94	9	44	19.47	4.1514199
Desert .....	213	12	17.39	33	17	57.39	4.4189270
Coconino .....	327	50	10.39	147	54	39.85	4.3341223

#### DESERT, COCONINO COUNTY.

On the east end of the second mesa from the west, in a group of mesa buttes which lie about 10 miles northeast of the mouth of the Little Colorado River. The mesa was covered with scattering cedar timber and some cutting was done around the station. Foot of butte can be reached by wagon from Willow Springs.

Station mark: A bronze triangulation tablet cemented in rock, under center of a cairn 6 feet high and 6 feet in diameter.

[Latitude 36° 17' 22.86". Longitude 111° 38' 39.69%.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	<i>Meters.</i>
Coconino .....	4	11	16.69	184	10	07.44	4.6056022
Comanche .....	33	17	57.39	213	12	17.39	4.4189270
Cardenas .....	56	23	51.71	236	19	07.87	4.1581709
Shinumo .....	157	53	36.43	337	51	03.59	4.2320781

#### ELLIOTT, COCONINO COUNTY.

On a prominent round-topped butte about 6 miles southeast of the mouth of Cataract Canyon. Top of butte was cleared of timber, so signal can be seen in all directions. Station can be reached with saddle horses from head of Topocobya trail.

Station mark: A bronze triangulation tablet cemented in limestone rock under a cairn 6 feet in diameter and 6 feet high.

[Latitude 36° 14' 59.38." Longitude 112° 37' 56.07".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Supai .....	23 55 32.28	203 53 27.71	4.1141108
Philips .....	165 13 48.93	245 11 35.17	4.3433722
Fossil .....	218 31 38.04	38 34 05.92	4.0002696
Apache .....	289 18 45.94	109 23 25.03	4.0968329
Chapin .....	320 43 56.42	140 47 57.81	4.2081040
Oliver .....	335 32 04.94	155 33 33.33	3.9555966

FINAL, COCONINO COUNTY.

On the southeastern extremity of the Greenland headland known as Cape Final. It is a prominent point and no cutting was done. The point can be reached with saddle horses from Greenland Spring.

Signal: A pole tripod 14 feet high centered over station mark.

Station mark: A bronze triangulation tablet cemented in limestone rock.

[Latitude 36° 08' 28.08". Longitude 111° 54' 30.28".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Royal .....	52 56 03.74	232 54 36.96	3.6640197
Saddle .....	168 40 23.19	348 38 53.83	4.2834731
Cardenas .....	234 04 26.74	54 09 04.56	4.1618480
Comanche .....	300 11 00.17	120 14 41.09	4.0353079

FLOYD, COCONINO COUNTY.

On highest point of Floyd Peak, 10 miles northeast of Seligman. North foot of mountain can be reached by wagon road from either Seligman or Ash Fork. Saddle horses can be taken within 300 feet of summit.

Station mark: A cairn, 8 feet base and 10 feet high, built by the Powell Survey in 1872.

Reference mark: A bronze tablet set in a large boulder; true azimuth from cairn, 290° 23'; distance, 12 feet.

[Latitude 35° 23' 29.88". Longitude 112° 43' 29.30".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Cataract.....	192 01 44.45	12 07 48.67	4.8746164
Bass.....	200 55 59.30	21 08 51.88	4.9658682
Sublime.....	205 27 45.63	25 44 23.07	4.9961160
Red Butte.....	230 17 26.15	50 39 36.07	4.8724083
Kendrick.....	268 31 27.33	89 01 48.55	4.8995706
Picacho.....	4 45 03.24	184 44 28.91	4.2584423
Rowe.....	214 10 05.72	34 30 04.66	4.9612843
Middle.....	217 54 56.04	38 17 22.48	4.9727543
Williams.....	294 12 18.34	114 30 18.21	4.7146324

## FOSSIL, COCONINO COUNTY.

On a prominent ridge on the west rim of the Grand Canyon near where the rim turns east. Station can be reached with saddle horses from the Bass and Supai road.

Signal: A pole tripod 12 feet high centered over tablet.

Station mark: A bronze tablet cemented in limestone rock.

[Latitude 36° 19' 13.28". Longitude 112° 33' 46.21".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Elliott.....	38 34 05.92	218 31 38.04	4.0002696
Phillips.....	138 44 20.70	318 39 38.62	4.2542865
Millett.....	222 13 38.44	42 18 07.76	4.2260816
Apache.....	335 06 12.81	155 08 24.32	4.1202820

## HOLLENBECK, COCONINO COUNTY.

On Hollenbeck Point, 6 miles northeast of Hall Tank, on canyon rim; can be reached on saddle horses from the latter place. Point is covered with scrub cedar, which was cut off around the station.

Signal: A pole tripod 13 feet high centered over station mark.

Station mark: A bronze triangulation tablet, stamped "7370 V," cemented in limestone rock.

[Latitude 36° 01' 34.43". Longitude 111° 52' 34.87".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Royal .....	146 37 38.29	326 35 03.67	4.0769757
Comanche .....	221 39 37.74	41 42 10.42	3.9895506
Coconino .....	301 22 08.30	121 29 09.93	4.3231168
Kendrick .....	358 07 01.91	178 07 54.18	4.8372895

KENDRICK, COCONINO COUNTY.

On highest point of Kendrick Mountain, the west foot of which can be reached by a wagon road from Spring Valley and Motts Lake. Saddle horses can be taken within 300 feet of summit.

Station mark: A bronze triangulation tablet cemented in malpais rock under a loose pile of rock 5 feet high.

[Latitude 35° 24' 24.83". Longitude 111° 51' 05.35".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Floyd .....	89 01 48.55	268 31 27.33	4.8995706
Red Butte .....	154 45 38.82	334 37 18.29	4.7041872
Royal .....	173 36 50.89	353 33 25.08	4.8986132
Hollenbeck .....	178 07 54.18	358 07 01.91	4.8372895
Coconino .....	195 15 20.27	15 21 26.53	4.7770728
Picacho .....	76 31 55.77	256 01 03.88	4.9206164
Williams .....	54 29 31.81	234 17 15.00	4.5979301

MILLETT, COCONINO COUNTY.

On a prominent point on the north rim, about halfway between Powells Plateau and the mouth of Kanab Canyon. Station can be reached with saddle horses from Bee Spring. A lone pine tree stands east of station. No other large timber near.

Signal: A pole tripod 16 feet high centered over tablet.

Station mark: A bronze triangulation tablet cemented in solid rock.

[Latitude 36° 25' 57.35". Longitude 112° 26' 12.11".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Apache .....	13 20 15.65	193 17 58.36	4.3996208
Fossil .....	42 18 07.76	222 13 38.44	4.2260816
Phillips .....	92 38 29.19	272 29 17.03	4.3650771
Sublime .....	327 23 53.96	147 30 29.71	4.4911712

## NORTH CANYON, COCONINO COUNTY.

On easternmost of two buttes which stand east of main mountain on north side of North Canyon, 6 miles southwest of Cane Springs, and can be reached by saddle horses from foot of mountain.

Signal: A tripod made of poles centered over station mark.

Station mark: A bronze triangulation tablet cemented in a limestone boulder.

[Latitude 36° 27' 26.55". Longitude 112° 02' 42.14".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Cane .....	228 54 00.26	48 57 37.79	4.0819001
Shinumo .....	275 19 29.70	95 31 13.44	4.4718207
Saddle .....	332 23 53.29	152 27 15.36	4.2634384

## OLIVER, COCONINO COUNTY.

On a prominent knoll about 3 miles southwest of Topocoby Spring. Knoll was covered with scattering cedar and piñon, and a small amount of cutting was necessary to clear it. Station can be reached with saddle horses from head of Topocoby trail.

Station mark: A bronze tablet cemented in limestone rock under center of a cairn 4 feet base and 4 feet high.

[Latitude 36° 10' 32.74". Longitude 112° 35' 26.46".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Supai .....	67 52 08.09	247 48 35.35	3.9881870
Elliott .....	155 33 33.33	335 32 04.94	3.9555966
Apache .....	243 08 22.71	63 11 33.20	3.9557725
Chapin .....	303 29 11.33	123 31 44.23	3.8903789
Cataract .....	345 35 35.08	165 36 58.18	4.1517421

## RED BUTTE, COCONINO COUNTY.

On Red Butte, a prominent flat-topped mountain about 15 miles southeast of Bright Angel Hotel. Summit cleared except on the south, east, and southwest part, where some timber still stands. A wagon road runs from Rain Tank around the foot of mountain on east side.

Station mark: A bronze triangulation tablet cemented in malpais rock near the center of the butte and under a cairn 6 feet high and 6 feet in diameter.

[Latitude 35° 49' 09.20". Longitude 112° 05' 24.90".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	
Floyd .....	50	39	36.07	230	17	26.08	4. 8724083
Cataract .....	121	57	01.30	301	40	46.75	4. 6900588
Bass .....	148	14	12.70	328	04	46.78	4. 6600887
Sublime .....	160	58	34.77	340	52	54.41	4. 6471363
Rowe .....	168	21	18.49	348	19	02.67	4. 4576552
Royal .....	201	03	58.48	21	08	56.49	4. 5478419
Kendrick .....	334	37	18.29	154	45	38.75	4. 7041872

#### ROWE, COCONINO COUNTY.

On Rowe Point, 2 miles northwest of Bright Angel Hotel, near wagon road.

Signal: A pole tripod 12 feet high and 6 feet at base.

Station mark: A bronze triangulation tablet set in rock 24 inches under the surface. Centered over this is an iron bench-mark post marked "7075 CANYON."

[Latitude 36° 04' 20.68". Longitude 112° 09' 16.28".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	
Bass .....	120	29	15.05	300	22	03.79	4. 3266836
Royal .....	255	15	11.99	75	22	27.24	4. 2811802
Red Butte .....	348	19	02.67	168	21	18.49	4. 4576552

#### ROYAL, COCONINO COUNTY.

On the southernmost point of the Greenland headland and the first point east of the mouth of the main drainage canyon of the headland. It is also the land end of the Newberry Terrace and can be reached with saddle horses from Greenland Spring. The point is rocky, and had previously been cleared, and only a little new cutting was done.

Signal: A pole tripod 10 feet high centered over station mark.

Station mark: A bronze triangulation tablet cemented in limestone rock.



[Latitude 36° 06' 57.84". Longitude 111° 56' 57.48".]

To station—	Azimuth.			Back azimuth,			Log. distance.
	°	'	"	°	'	"	Meters.
Red Butte .....	21	08	56.49	201	03	58.48	4.5478419
Rowe .....	75	22	27.24	255	15	11.99	4.2811802
Bass .....	99	14	26.13	278	59	58.91	4.5709072
Final .....	232	54	36.96	52	56	03.74	3.6640197
Comanche .....	281	32	40.50	101	37	48.09	4.1247756
Coconino .....	310	24	28.37	130	34	04.88	4.5088644
Hollenbeck .....	326	35	03.67	146	37	38.29	4.0769757
Kendrick .....	353	33	25.08	173	36	50.89	4.8986132

## SADDLE, COCONINO COUNTY.

On highest point of mountain, cut off from Kaibab Plateau by deep saddle. This mountain lies about 10 miles northwest of mouth of Little Colorado River and can be best reached with saddle horses from Cane Springs. A great deal of cutting was necessary to clear lines of sight to all stations sighted.

Station mark: A bronze triangulation tablet cemented in solid rock under center of a cairn 6 feet high and 6 feet in diameter.

Reference mark: An 18-inch dead pine tree 28 feet north of station mark.

[Latitude 36° 18' 39.08". Longitude 111° 57' 01.50".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
North Canyon .....	152	27	15.36	332	23	53.29	4.2634384
Cane .....	181	28	49.02	1	29	03.94	4.3838093
Shinumo .....	237	19	34.20	57	27	54.71	4.3975134
Cardenas .....	303	34	31.21	123	40	39.04	4.2704914
Final .....	348	38	53.83	168	40	23.19	4.2834731

## SHINUMO, COCONINO COUNTY.

On the highest point of the south end of Shinumo Altar, a prominent bald mesa butte about 15 miles north of the mouth of the Little Colorado River and 7 miles east of the Colorado River. Foot of butte can be reached by wagon from Willow Springs.

Station mark: A bronze triangulation tablet cemented in limestone rock under center of cairn 6 feet high and 6 feet in diameter.

[Latitude 36° 25' 55.69". Longitude 111° 42' 57.49".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Cardenas .....	13 08 08.24	193 05 56.64	4.3877147
Saddle .....	57 27 54.71	237 19 34.20	4.3975134
North Canyon .....	95 31 13.44	275 19 29.70	4.4718207
Cane .....	117 50 14.73	297 42 07.86	4.3624460
Desert.....	337 51 03.59	157 53 36.43	4.2320781

SUBLIME, COCONINO COUNTY.

Near the south end of the headland known as Point Sublime. There is a blazed trail to the point, and the station can be reached by pack train. There is scattering timber on the point and a little clearing had to be done around the station.

Signal: A pole tripod 11 feet high centered over the station mark.

Station mark: A bronze triangulation tablet cemented in the rock, about 12 inches under the surface of the ground.

[Latitude 36° 11' 49.93". Longitude 112° 15' 03.86".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Floyd .....	25 44 23.07	205 27 45.63	4.9961160
Bass .....	72 07 12.97	252 03 26.26	4.0036308
Apache.....	94 23 35.22	274 14 43.60	4.3531054
Millett .....	147 30 29.71	327 23 53.96	4.4911712
Red Butte .....	340 52 54.41	160 58 34.77	4.6471363

SUPAI, COCONINO COUNTY.

On a small round-topped butte three-fourths mile southeast of the Hilltop storehouse, at the head of the Walapai trail. Station can be reached with saddle horses from Hilltop.

Station mark: A bronze triangulation tablet cemented in limestone rock under a cairn 5 feet at base and 6 feet high.

[Latitude 36° 08' 33.65". Longitude 112° 41' 27.03".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Elliott.....	203 53 27.71	23 55 32.28	4.1141108
Oliver .....	247 48 35.35	67 52 08.09	3.9881870
Chapin .....	272 14 02.19	92 20 07.68	4.1905212
Cataract.....	308 41 56.74	128 46 52.24	4.2064305

## PHILLIPS, MOHAVE COUNTY.

On the west rim of Kanab Canyon, near the northwest corner of the last bay before the rim of Kanab Canyon joins the north rim of Grand Canyon. Station can be reached by wagon from Finley reservoir and Black Knolls. Cedar and piñon timber is on the north and west of station.

Signal: A sawed timber tripod 12 feet high centered over station mark.

Station mark: A bronze triangulation tablet cemented in limestone rock.

[Latitude 36° 26' 31.00". Longitude 112° 41' 41.76".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Millett .....	272 29 17.03	92 38 29.19	4.3650771
Fossil .....	318 39 38.62	138 44 20.70	4.2542865
Elliott.....	245 11 35.17	165 13 48.93	4.3433722

## Maricopa and Yavapai counties.

In the fall of 1900, Mr. H. L. Baldwin, jr., topographer, extended triangulation northwestward from Camels Back and Black Mesa stations, which were established the preceding year by Prof. A. H. Thompson, geographer; eight new stations, controlling two 30-minute quadrangles in Maricopa and Yavapai counties, were occupied.

## PYRAMID, MARICOPA COUNTY.

On the highest part of the conical hill known on the public-land survey maps as Pyramid Mountains, and about 3 miles a little south of east of New River station on the Frog Tanks road.

Station mark: A bronze bench-mark tablet cemented in a granite boulder.

Reference mark: A rock cairn, 5 feet high and 4 feet in diameter at base; true azimuth from station, 351° 10'; distance, 5 feet.

[Latitude 33° 44' 45.17". Longitude 112° 10' 53.61".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Camels Back .....	321 38 10.48	141 45 28.04	4.5165837
Black Mesa .....	223 29 48.27	43 36 32.51	4.4328558
New River .....	206 45 46.67	26 51 39.70	4.5570802
Syenite.....	120 32 16.33	300 25 19.78	4.3493361
Silver .....	153 52 44.98	333 45 11.39	4.6747504

SYENITE, MARICOPA COUNTY.

On the summit of a prominent rounded peak about 8 miles west of the Agua Fria dam at Camp Dyer.

Station mark: A bronze bench-mark tablet set in solid rock.

Reference mark: A rock cairn, 4½ feet base and 7 feet high; true azimuth from station, 223° 53'; distance, 7.85 feet.

[Latitude 33° 50' 53.17". Longitude 112° 23' 22.48".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Silver .....	177 00 00.07	356 59 24.52	4.4933180
New River .....	239 27 35.04	59 40 26.66	4.6144764
Black Mesa .....	257 32 16.00	77 45 58.28	4.5888110
Pyramid .....	300 25 19.78	120 32 16.23	4.3493361
Camels Back .....	313 00 00.38	133 14 13.81	4.7348605

BOULDER PASS, YAVAPAI COUNTY.

On the highest hill about 1 mile northeast of Boulder Pass, on the wagon road from Hot Springs to Minnehaha.

Station mark: A bronze bench-mark tablet set in sandstone rock.

[Latitude 34° 06' 53.32". Longitude 112° 30' 05.88".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Mount Union .....	194 59 39.81	15 02 55.72	4.5358861
Del Pasco .....	223 07 36.48	43 12 05.85	4.2541341
Silver .....	260 06 30.29	80 09 40.92	3.9463803

DEL PASCO, YAVAPAI COUNTY.

On the highest part of mountain of that name, about 3 miles north-west of the Crowned King mining camp.

Station mark: A bronze bench-mark tablet set in solid rock.

[Latitude 34° 13' 58.31". Longitude 112° 22' 06.34".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Silver .....	17 10 59.75	197 09 41.25	4.0835313
Boulder Pass .....	43 12 05.85	223 07 36.48	4.2541341
Mount Union .....	170 29 58.37	350 28 44.18	4.3087386
Squaw Peak .....	239 55 11.00	60 11 52.00	4.7187145
New River .....	303 01 09.15	123 13 21.93	4.6015068
Black Mesa .....	313 40 55.00	133 53 58.75	4.6961884

## MOUNT UNION, YAVAPAI COUNTY.

On the highest part of Mount Union,  $1\frac{1}{2}$  miles east of the Senator mine.

Station mark: A bronze bench-mark tablet set in granite boulder.

Reference marks: A rock cairn with small tree placed in center; true azimuth from station,  $176^{\circ}$ ; distance, 3.83 feet. A cross (+) cut on granite rock; true azimuth from station,  $294^{\circ} 13'$ ; distance, 2.75 feet.

[Latitude,  $34^{\circ} 24' 49.94''$ . Longitude,  $112^{\circ} 24' 17.92''$ .]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	''	°	'	''	
Boulder Pass.....	15	02	55.72	194	59	39.81	<i>Meters.</i> 4.5358861
Squaw Peak.....	83	04	30.00	262	46	32.00	4.6904200
Del Pasco.....	350	28	44.18	170	29	58.37	4.3087386

## NEW RIVER, YAVAPAI COUNTY.

On summit of the highest peak of the ridge between Black Canyon and New River.

Station mark: A bronze bench-mark tablet set in small rock about 2 inches below surface of ground and at the southwest edge of a rock cairn. It is close to and north of a sharp rock which projects slightly above surface of ground.

[Latitude,  $34^{\circ} 02' 09.86''$ . Longitude,  $112^{\circ} 00' 20.53''$ .]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	''	°	'	''	
Pyramid.....	26	51	39.70	206	45	46.67	4.5570802
Syenite.....	59	40	26.66	239	27	35.04	4.6144764
Silver.....	105	34	10.27	285	20	40.19	4.5849214
Del Pasco.....	123	13	21.93	303	01	09.15	4.6015068
Mount Union.....	138	49	55.87	318	36	27.39	4.7463591
Black Mesa.....	349	13	55.85	169	14	47.79	4.1064174

## SILVER, YAVAPAI COUNTY.

On highest peak of the Silver Mountains, about 4 miles south of Minnehaha.

Station mark: A bronze bench-mark tablet cemented in solid rock.

Reference mark: A rock cairn 4 feet high,  $3\frac{1}{2}$  feet base; true azimuth from station,  $217^{\circ} 11'$ ; distance, 4 feet.

[Latitude 34° 07' 42.47". Longitude 112° 24' 26.08".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Boulder Pass.....	80 09 40.92	260 06 30.29	3.9463803
Del Pasco.....	197 09 41.25	17 10 59.75	4.0835313
New River.....	285 20 40.19	105 34 10.27	4.5849214
Black Mesa.....	299 53 36.04	120 07 56.92	4.6587958
Pyramid.....	333 45 11.39	153 52 44.98	4.6747504
Syenite.....	356 59 24.52	177 00 00.07	4.4933180

SQUAW PEAK, YAVAPAI COUNTY.

On highest part of Squaw Peak, 4 miles southwest of Camp Verde.

Station mark: A bronze bench-mark tablet set in a flat basalt rock.

Reference mark: A rock cairn 4½ feet base and 6 feet high; true azimuth from station, 107° 22'; distance, 5½ feet.

[Latitude 34° 28' 05.9". Longitude 111° 52' 32.2".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Del Pasco.....	60 11 52	239 55 11	4.7187145
Mount Union.....	83 04 30	262 46 32	4.6904235

Maricopa County; secondary positions.

Secondary positions located by lines from two stations.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Rock cairn .....	33 59 09.0	112 01 47.2
Highest point 8 miles east of Phoenix mine .....	33 54 44.6	111 47 04.8
High point (sharp).....	33 52 43.8	111 53 32.9
Bald Mountain <sup>a</sup> .....	34 27 12.8	111 56 36.5

<sup>a</sup> Yavapai County.

**Yavapai County; secondary positions.**

Secondary positions located by lines from three or more stations.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Rock Bluff .....	34	14	06.1	112	24	42.1
Conical rock .....	34	07	03.2	112	14	11.5
Round Hill .....	34	29	13.3	112	12	15.2
Do .....	34	31	09.3	112	11	18.1
Pinnacle .....	34	06	56.5	112	28	45.5
Peak .....	34	06	37.8	112	24	05.1
Southeast Twinpoint .....	34	11	30.2	112	15	49.0
Square Rock .....	33	57	40.7	112	30	55.3
West End (Double Butte) <sup>b</sup> .....	33	52	41.8	112	03	39.0

<sup>b</sup> Maricopa County.

**SECONDARY TRIANGULATION STATIONS.**

**Cochise County; Bisbee quadrangle.**

Control for the Bisbee quadrangle is based upon the positions of boundary monuments No. 91 and No. 93, as given by the report of the United States and Mexico Boundary Commission. The field work was by Mr. T. M. Bannon in February, 1902, twelve stations being located.

**BISBEE WEST, COCHISE COUNTY.**

On a lone hill near the Bisbee West mine.

Station mark: A rock monument.

[Latitude 31° 24' 59.32". Longitude 109° 56' 17.42%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Lime Hill .....			3. 35974
Johnson .....			3. 69065

**BOUNDARY MONUMENT NO. 91, COCHISE COUNTY.**

Station mark: Center of monument.

[Latitude 31° 20' 01.95". Longitude 109° 52' 24.96%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Boundary monument No. 93 .....	90 02 23	269 59 03	4.00680
Naco Junction .....			4.08826
Irving flag .....			4.15600
Johnson No. 3 .....	170 53 19	350 52 53	3.92142

**BOUNDARY MONUMENT NO. 93, COCHISE COUNTY.**

Station mark: Center of monument.

[Latitude 31° 20' 02.02". Longitude 109° 58' 49.20%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Naco Junction .....			3.83644
Bisbee West .....			3.99980
Don Louis .....	219 31 23	39 33 39	4.03586
Johnson No. 3 .....	226 58 13	47 01 07	4.08196
Boundary monument 91 .....	269 59 03	90 02 23	4.00680

**CALUMET AND ARIZONA FLAG, COCHISE COUNTY.**

On the end of a limestone ridge one-fourth mile west of the Calumet and Arizona mine.

Station mark: A rock monument.

[Latitude 31° 25' 43.87". Longitude 109° 54' 44.06%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Lime Hill .....	21 52 48	201 52 42	2.88670
Red Hill .....	185 30 11	5 30 14	3.24666
Mineral monument No. 2 .....	222 41 08	42 41 19	2.92520
North-end flag .....	303 06 50	123 07 04	2.92139

**CENTER FLAG, COCHISE COUNTY.**

On the highest point of a limestone hill 0.5 mile south of the Lowell mine.

Station mark: A bench-mark tablet marked 5604 feet.



[Latitude 31° 25' 19.02". Longitude 109° 54' 10.32".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Don Luis .....	18 07 50	198 07 41	3. 16412
Lime Hill .....	92 28 27	272 28 04	3. 07165
North-end flag .....	148 09 21	328 09 17	2. 56184
Johnson No. 3 .....	316 14 22	136 14 51	3. 32487

## DON LUIS, COCHISE COUNTY.

On a limestone hill at the south end of a limestone ridge three-fourths mile northeast of Don Luis railroad station.

Station mark: A bench-mark tablet marked 5525 feet.

[Latitude 31° 24' 33.98". Longitude 109° 54' 27.52".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Boundary monument No. 93 .....	39 33 39	219 31 23	4. 03586
Mineral monument No. 3 .....			2. 94204
Lime Hill .....	153 15 41	333 15 27	3. 20678
Center flag .....	198 07 41	18 07 50	3. 16412
Johnson No. 3 .....	274 09 15	94 09 53	3. 28339

## JOHNSON NO. 3, COCHISE COUNTY.

On the highest point of Limestone Hill and one-half mile northeast of Don Luis railroad station.

Station mark: A bench-mark tablet marked 5,493 feet.

[Latitude 31° 24' 29.48". Longitude 109° 53' 14.99".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Boundary monument No. 93 .....	47 01 07	226 58 13	4. 08196
Don Luis .....	94 09 53	274 09 15	3. 28339
Lime Hill .....			3. 48780
Calumet and Arizona flag .....			3. 51642
Center flag .....	136 14 51	316 14 22	3. 32487
Mineral monument No. 2 .....			3. 53304
Red Hill .....			3. 66264
Boundary monument No. 91 .....	350 52 53	170 53 19	3. 92142

LIME, COCHISE COUNTY.

A summit on limestone ridge,  $1\frac{1}{2}$  miles due north of Don Luis railroad station and three-fourths mile southwest of the Lowell mine.

Station mark: A bench-mark tablet marked 6,320 feet.

[Latitude  $31^{\circ} 25' 20.66''$ . Longitude  $109^{\circ} 54' 54.94''$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Mineral monument No. 3.....			3. 13942
Red Hill .....			3. 40009
Calumet and Arizona flag.....	201 52 42	21 52 48	2. 88670
Mineral monument No. 2.....			3. 20014
North-end flag .....	255 16 58	75 17 17	3. 00835
Center flag .....	272 28 04	92 28 27	3. 07165
Johnson No. 3 .....			3. 48780
Don Luis .....	333 15 27	153 15 41	3. 20678

MINERAL MONUMENT NO. 2, COCHISE COUNTY.

On a lone, black mineral hill about 1 mile south of Bisbee and one-half mile east of the Spray mine.

Station mark: A bench-mark tablet marked 5656 feet, under a small monument 5.1 feet south of iron post, mineral monument No. 2.

[Latitude  $31^{\circ} 26' 03.96''$ . Longitude  $109^{\circ} 54' 22.46''$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Calumet and Arizona flag.....	42 41 19	222 41 08	2. 92520
Red Hill .....	160 33 46	340 33 38	3. 08142
Johnson No. 3 .....			3. 53304
Center flag.....			3. 15252
North-end flag .....	353 11 33	173 11 36	3. 03433

MINERAL MONUMENT NO. 3, COCHISE COUNTY.

The large rock mineral monument three-fourths mile north of Don Luis station.

Station mark: Center of monument.

[Latitude 31° 24' 36.16". Longitude 109° 55' 00.55%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Lime Hill.....			3. 13942
Don Luis.....			2. 94204

## NACO JUNCTION, COCHISE COUNTY.

On a hill three-fourths mile northeast of Naco Junction, on the El Paso and Southwestern Railroad.

[Latitude 31° 23' 44.83". Longitude 109° 58' 49.06%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Boundary monument No. 91.....			4. 08826
Boundary monument No. 93.....			3. 83644
Lime Hill.....			3. 83630

## RED HILL, COCHISE COUNTY.

On a red hill at the west end of ridge on the south side of Brewery Gulch and about 0.5 mile east of Bisbee.

Station mark: A bench-mark tablet marked 5,895 feet, cemented under a rock monument.

[Latitude 31° 26' 40.90". Longitude 109° 54' 37.66%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Calumet and Arizona flag.....	5 30 14	185 30 11	3. 24666
Mineral monument No. 2.....	340 33 38	160 33 46	3. 08142

## CALIFORNIA.

## TRIANGULATION STATIONS.

## Kern County.

Three 15-minute quadrangles were controlled by Mr. C. F. Urquhart, topographer, who extended triangulation westward from Oldtown and Breckinridge. Besides reoccupying these, eight new stations were built and occupied. Positions are given on the United States standard datum.

## BAKERSFIELD, KERN COUNTY.

Station mark: Center of cupola on court-house at Bakersfield.

[Latitude  $35^{\circ} 22' 23.40''$ . Longitude  $119^{\circ} 01' 07.13''$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Jewetta .....	142 54 59.35	322 52 30.33	4.0316615
Oil .....	184 19 36.84	4 20 01.68	4.1556536
Round .....	223 18 15.28	43 22 46.34	4.2351484
Lakeview .....	290 15 18.51	110 22 21.64	4.2943877

## BEALE, KERN COUNTY.

On a bald hill in Mr. Truxton Beale's pasture, on north of road from Bakersfield to Caliente, and about 5 miles from latter.

Station mark: A bronze triangulation tablet under center of cairn.

[Latitude  $35^{\circ} 15' 12.17''$ . Longitude  $118^{\circ} 41' 16.99''$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Lakeview .....	119 08 15.22	299 03 50.29	4.1227132
Pampa .....	170 08 28.22	350 07 38.79	4.1006651
Rankin .....	219 43 02.42	39 46 33.04	4.1583974

## BRECKINRIDGE, KERN COUNTY.

The station is at the eastern end of Breckinridge Mountain, a heavily timbered plateau south of the Kern River, 6 miles west of Havilah. It was ascended from Rankin's ranch in Walker basin in three and one-fourth hours by following the main ridge.

Station mark: A bronze triangulation tablet cemented in the top of a ledge which projects 10 or 12 feet above surface of ground, surmounted by a cairn 5 feet high.

[Latitude  $35^{\circ} 27' 03.86''$ . Longitude  $118^{\circ} 34' 58.89''$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Oldtown .....	351 04 52.21	171 06 46.54	4.5091169
Rankin .....	1 48 57.45	181 48 49.55	4.0360517
Pampa .....	50 55 30.33	230 51 01.71	4.1782951

JEWETTA, KERN COUNTY.

Station is in the valley northwest from Jewetta, a siding on the Southern Pacific Railroad above Bakersfield.

Signal: A lumber tripod.

Station mark: A bronze triangulation tablet cemented in rock under center of tripod.

[Latitude 35° 27' 01.76". Longitude 119° 05' 24.31".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Oil .....	233 01 02.75	53 03 56.87	3.9761508
Bakersfield .....	322 52 30.33	142 54 59.35	4.0316615

LAKEVIEW, KERN COUNTY.

On Lakeview schoolhouse, about 14 miles by road ESE. from Bakersfield.

Station mark: Flag pole on cupola.

[Latitude 35° 18' 41.52". Longitude 118° 48' 55.66".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Bakersfield .....	110 22 21.64	290 15 18.51	4.2943877
Round .....	161 01 04.18	340 58 31.32	4.3107062
Pampa .....	237 36 40.24	57 40 16.07	4.0474858
Beale .....	299 03 50.29	119 08 15.22	4.1227132

OIL, KERN COUNTY.

About 10 miles almost due north from Bakersfield, on a sand hill about 200 yards east of the most northwestern group of oil wells.

Signal: A lumber tripod.

Station mark: A bronze triangulation tablet cemented in rock under center.

[Latitude 35° 30' 06.42". Longitude 119° 00' 24.29".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Bakersfield .....	4 20 01.68	184 19 36.84	4.1556536
Jewetta .....	53 03 56.87	233 01 02.75	3.9761508
Round .....	279 21 40.81	9) 25 47.42	4.0354821

## OLDTOWN, KERN COUNTY.

A low peak at the northern edge of Tehachapi Pass, about 2 miles north of the old settlement of Tehachapi.

Station mark: A bronze triangulation tablet cemented in solid rock surmounted by a cairn 6 feet high.

[Latitude  $35^{\circ} 09' 48.59''$ . Longitude  $118^{\circ} 31' 41.06''$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Breckinridge .....	171 06 45.54	351 04 52.21	4. 5091169
Pah Ute .....	201 18 06.13	21 22 51.50	4. 5350191
Cache .....	255 32 11.59	75 41 49.28	4. 4179828
Pajuela .....	282 23 32.31	102 31 37.32	4. 3393768
Double .....	344 44 02.36	164 45 32.38	4. 1782222

## PAMPA, KERN COUNTY.

On a high foothill about 3 miles northeast from Pampa, a station on the Southern Pacific Railroad.

Station mark: A bronze triangulation tablet under center of cairn with tree in center (there are three or four other trees on hill, but cairn can be easily seen).

[Latitude  $35^{\circ} 21' 55.25''$ . Longitude  $118^{\circ} 42' 42.51''$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Lakeview .....	57 40 16.07	237 36 40.24	4. 0474858
Round .....	129 48 05.81	309 41 56.56	4. 3201804
Breckinridge .....	230 51 01.71	50 55 30.33	4. 1782951
Rankin .....	276 44 14.06	96 48 34.46	4. 0584457
Oldtown .....	323 12 07.72	143 18 29.61	4. 4463278
Beale .....	350 07 38.79	170 08 28.22	4. 1006651

## RANKIN, KERN COUNTY.

On a high foothill about 4 miles from Mr. Rankin's ranch in Walker basin. Road from Rankin's to Bakersfield passes very near and to the west of signal.

Station mark: A bronze triangulation tablet in rock to south of signal tree.

Reference mark: The dead pine signal tree trimmed up.

[Latitude 35° 21' 11.47". Longitude 118° 35' 12.53".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Beale .....	39 46 33.04	219 43 02.42	4. 1583974
Pampa .....	96 48 34.46	276 44 14.06	4. 0584457
Breckinridge .....	181 48 49.55	1 48 57.45	4. 0360517

## ROUND, KERN COUNTY.

On a sand ridge about 15 miles from Bakersfield by road and ridge. Go from Bakersfield to east side of oil field, thence over Kern River about 3 miles, thence up ridge north of river to station.

Signal: A lumber tripod.

Station mark: A bronze triangulation tablet under center.

[Latitude 35° 29' 08.94". Longitude 118° 53' 19.55".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Bakersfield .....	43 22 46.34	223 18 15.28	4. 2351484
Oil .....	99 25 47.42	279 21 40.81	4. 0354821
Pampa .....	309 41 56.56	129 48 05.81	4. 3201804
Lakeview .....	340 58 31.32	161 01 04.18	4. 3107062

## PRIMARY TRAVERSE.

Colusa, Tehama, and Yolo counties; Arbuckle, Norman, Tehama, Vina, and Willow quadrangles.

Five 15-minute quadrangles in the Sacramento Valley between Arbuckle and Red Bluff were controlled by 255 miles of primary traverse run by Mr. C. F. Urquhart, topographer, in the spring of 1903. The line starts at Northwest Yolo base triangulation station United States Coast and Geodetic Survey, follows county roads until it strikes the Southern Pacific Railroad north of Woodland, thence along this railroad to Red Bluff. It also follows the railroad from Tehama to Chico, thence along county roads to Orland. A line was run approximately on the 122d meridian between latitude 39° 00' and 39° 43', with several cross lines between 122° 00' and 122° 15'. Positions are given on the United States standard datum.

Since this work was done the alignment of the railroad track has in places been changed, and the descriptions of a few of the positions given may thus need correction.

*Geographic positions between Northwest Yolo base triangulation station, United States Coast and Geodetic Survey, and Liberty schoolhouse.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Northwest Yolo base triangulation station, U. S. Coast and Geodetic Survey.....	38	40	44.8	121	51	28.6
Station 10, road turns north.....	38	42	24.9	121	51	21.8

*Geographic positions along the Southern Pacific Railroad from Liberty schoolhouse to Red Bluff.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Liberty schoolhouse, road crossing near .....	38	45	36.4	121	50	23.2
Blacks or Zamora, road crossing.....	38	47	58.6	121	52	53.1
Road crossing.....	38	50	45.0	121	55	48.7
Dunnigan station.....	38	53	07.4	121	58	07.4
Road crossing.....	38	54	57.5	121	59	19.6
Road crossing, 60 feet north of .....	38	57	45.1	122	01	09.7
Arbuckle station .....	39	01	03.9	122	03	20.6
Genevra, signboard.....	39	04	11.3	122	05	24.0
Road crossing, joint in rail.....	39	06	04.9	122	06	38.9
Road crossing, 20 feet north.....	39	08	00.1	122	07	54.7
Williams station .....	39	09	19.8	122	08	47.3
Milepost 127 .....	39	10	44.3	122	09	43.0
Colusa Junction, narrow-gage railroad crossing .....	39	13	07.7	122	11	07.4
Colusa Junction station.....	39	13	11.0	122	11	09.2
Road crossing.....	39	14	50.8	122	11	23.9
Maxwell station.....	39	16	35.0	122	11	24.7
Bunks Slough, road crossing north of .....	39	20	04.9	122	11	26.4
Milepost 141 .....	39	22	38.1	122	11	27.6
Norman station .....	39	24	26.0	122	11	28.5
Lyondale platform .....	39	26	18.5	122	11	29.3
Milepost 148 .....	39	28	43.1	122	11	30.4
Willows station .....	39	31	14.0	122	11	31.6
Milepost 153, 820 feet northwest of .....	39	33	13.8	122	11	32.5
Milepost 155 .....	39	34	49.4	122	11	33.2
Gormantown station.....	39	37	14.5	122	11	34.3
Road crossing.....	39	39	12.5	122	11	35.2
Road crossing at gravel pit, rail joint north of road .....	39	40	56.9	122	11	36.0
Road crossing.....	39	43	33.1	122	11	42.4
Orland railroad station .....	39	44	44.7	122	11	44.7



*Geographic positions along the Southern Pacific Railroad from Liberty schoolhouse to Red Bluff—Continued.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Stony Creek station, first road crossing north, joint north of road .....	39	46	09.1	122	11	28.7
Malton, signboard .....	39	47	44.7	122	10	42.5
Road crossing .....	39	50	10.7	122	09	31.9
Kirkwood station .....	39	51	19.3	122	09	48.4
Milepost 176 .....	39	52	40.1	122	10	28.2
Road crossing .....	39	54	22.9	122	10	40.2
Corning station .....	39	55	41.5	122	10	40.4
Milepost 182 .....	39	57	50.5	122	10	38.0
Milepost 184 .....	39	59	31.1	122	10	11.9
Tehama, joint in rails at junction of track with Marysville Branch, 14.3 feet south of switch lever and 67 feet south of and opposite water tank .....	40	01	49.1	122	08	03.6
Milepost 215 .....	40	03	12.7	122	09	00.8
Proberta .....	40	04	52.7	122	10	09.2
Ransom .....	40	07	10.9	122	11	43.9
Milepost 222 .....	40	08	36.1	122	12	42.4
Red Bluff, Main street crossing .....	40	10	35.9	122	14	18.6

*Geographic positions along highways from Red Bluff eastward 4 miles, thence southward to Tehama.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Red Bluff, west end of bridge 0.5 mile east of .....	40	10	39.2	122	13	53.8
Antelope school .....	40	11	09.1	122	11	38.0
Junction of roads .....	40	11	04.1	122	10	31.4
Opposite Cone ranch house .....	40	10	20.1	122	09	49.6
Adobe ranch .....	40	07	33.3	122	06	53.9

*Geographic positions along Marysville Branch Southern Pacific Railroad, between Tehama and Chico.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Tehama, 55 feet east of east end of trestle leading to bridge over Sacramento River.....	40	01	45.9	122	06	39.6
Milepost 210.....	40	00	29.7	122	05	34.2
Milepost 208.....	39	58	53.0	122	04	44.4
Vina railroad station, 75 feet north road crossing.....	39	55	58.3	122	03	14.5
Milepost 202.....	39	54	03.3	122	02	07.4
Lota signboard.....	39	52	31.3	122	01	08.4
Cana station, signboard.....	39	50	25.4	121	59	47.6
Road crossing.....	39	49	07.6	121	58	57.7
Nord station, road crossing.....	39	46	47.1	121	57	21.6
Milepost 191, elevation 148 feet.....	39	45	55.2	121	55	53.3
Chico, crossing Third street.....	39	43	28.8	121	50	48.0

*Geographic positions along county roads from Chico to Orland.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Chico, at turn of road 20 feet northwest of water tank....	39	42	43.7	121	51	53.3
At turn of road, 45 feet east of large gate into private field.....	39	41	46.3	121	55	22.0
Sacramento River, 10 feet east of bridge over.....	39	42	44.7	121	56	42.9
Junction of roads to Orland and Jacinto.....	39	42	32.9	122	00	08.6
Junction road from north, 35 feet south fence corner....	39	42	33.5	122	02	37.5
Road crossing.....	39	42	39.2	122	05	04.3
Junction of roads north and south.....	39	42	39.1	122	08	23.9
Road crossing.....	39	44	13.9	122	10	10.6
Orland.....	39	44	44.7	122	11	44.7

*Geographic positions along county roads from Willows (on S. P. R. R.) to Jacinto, thence north to station 508 on line between Chico and Orland.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Center of road at junction of road turning north, jog in road east and west .....	39 31 27.3	122 08 09.3
Center of junction of road running east .....	39 33 12.2	122 08 09.2
Center of roads, road to Jacinto turns east .....	39 34 56.4	122 08 09.8
Turn in road to north .....	39 34 55.4	122 05 56.4
Fifty feet southwest of southwest corner of fence around ranch house on north side of road. The only house for long distance. Point at south edge of road opposite telephone pole.....	39 34 57.2	122 02 47.9
Jacinto, at junction of road north and south point 50 feet north of signboard at fence corner.....	39 34 57.1	122 00 22.9
At angle in road opposite high telephone pole marked "613," center of road.....	39 36 10.8	122 00 24.5
Telephone pole marked "618".....	39 38 38.4	122 00 23.6
Road turns north.....	39 40 27.8	122 00 17.3
Station 508, on line Chico-Orland .....	39 42 32.9	122 00 08.6

*Geographic positions along county roads from station 556 on line from Willows to Jacinto to "Four Corners," 1½ miles west from Butte City.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Junction of road from Williams to Butte City.....	39 29 41.1	122 08 09.5
At turn of Butte road to east, road also continues south, iron bench mark post is 34 feet northeast, elevation 97 feet .....	39 27 53.3	122 08 08.5
At turn of road east, 575 cut in telephone pole southeast of station.....	39 27 29.6	122 05 48.8
Butte City, "Four Corners," 1½ miles west from.....	39 27 26.6	122 00 59.0

*Geographic positions along county roads from Jacinto south to "Four Corners."*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Center of road, opposite old gate in fence to east.....	39 32 46.2	122 00 16.6
Center of road going west to Willows, west post on property line.....	39 31 18.6	122 00 47.0
Center of road, opposite schoolhouse to west .....	39 30 39.0	122 00 58.1
Opposite driveway to cottage, 656 cut on post at gate.....	39 28 20.6	122 01 05.6

*Geographic positions along county roads from "Four Corners" south via Colusa to Arbuckle.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Opposite southwest corner of sheet-iron warehouse, large oak tree between road and warehouse.....	39 25 41.7	122 00 36.6
Princeton, east side of road, 92 feet north from "Odd Fellows" hall and 25 feet east from center of road.....	39 24 15.8	122 00 30.6
Road crossing, gate on either side of road, road to east leads to residence of late John Boggs.....	39 22 37.4	122 01 10.5
Opposite schoolhouse, iron gate.....	39 20 29.2	122 02 04.4
North end of bridge over ditch, 1,060 feet south from Mr. F. A. Wohlfoom's residence.....	39 18 12.6	122 01 56.4
Road to west, signboard as follows: Maxwell, 8.5 miles, Princeton, 8.75 miles, Colusa, 5 miles.....	39 16 40.5	122 02 04.4
Road intersects from the west, house on southwest corner.....	39 14 36.0	122 01 49.4
Colusa, road crossing narrow-gage railroad (north rail)...	39 13 02.1	122 00 58.6

*Geographic positions along railroad through Colusa to end of track and on county road south to Arbuckle.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Junction of road to Arbuckle, point 91 feet from gate in fence between roads.....	39 12 12.8	122 00 14.1
Station 744, 8 feet east of center of road on top of levee....	39 09 33.4	122 00 51.1
In center of road, east of and opposite fence corner, (only fence in several miles), corner of levee just inside of fence.....	39 06 55.3	122 01 17.1
At center of junction of road from north.....	39 05 22.8	122 01 17.9
At center of junction of east and west roads, bridge over ditch just to north of station, line turns east.....	39 03 24.3	122 01 19.9
Junction of road turning west to Arbuckle (road continues south).....	39 01 39.8	122 00 54.6
At T road junction, west and south, line turns south....	39 01 39.9	122 03 02.0
Arbuckle station.....	39 01 03.9	122 03 20.6

*Geographic positions along narrow-gage railway from Colusa to Colusa Junction.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Station 7, center of road crossing, along top of embankment north and south.....	39 13 04.1	122 04 35.9
Station 11, road crossing.....	39 13 05.3	122 06 55.9
Colusa Junction, crossing of railroads.....	39 13 07.7	122 11 07.4

## COLORADO.

## TRIANGULATION STATIONS.

Boulder, Clear Creek, Gilpin, and Jefferson counties; Central and Georgetown quadrangles.

During the early part of the season of 1903, Mr. H. L. Baldwin, jr., controlled two 15-minute quadrangles by reoccupying three old triangulation stations, occupying nine new stations, and locating ten points by intersections. Positions are given on the United States standard datum as derived from Mount Morrison and Table Mound, stations of the United States Coast and Geodetic Survey.

## SOUTH BOULDER, BOULDER COUNTY.

On mountain of same name, 4.5 miles west of Marshall (Gorham post-office) and 5 feet east of highest point of eastern summit of mountain.

Station mark: A bronze triangulation tablet cemented in solid rock.

[Latitude  $39^{\circ} 57' 37.50''$ . Longitude  $105^{\circ} 17' 40.62''$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Morgan .....	265 33 17.12	85 43 41.84	4.3645097
Westminster .....	291 25 51.83	111 36 03.95	4.3865108
North Table Mountain .....	336 39 17.06	156 42 54.86	4.3095850
Mount Morrison .....	348 40 34.18	168 43 28.06	4.5178904

## CHIEF, CLEAR CREEK COUNTY.

On mountain of same name, 8 miles south of Idaho Springs.

Point is best reached by following wagon road from Idaho Springs up Soda Creek to bars, and thence up east fork of creek to summit within 0.75 mile of its head. Here leave road and pass through burnt timber to point.

Station mark: A bronze triangulation tablet cemented in solid rock, over which is erected a rock cairn, 4 feet base and 5 feet high.

[Latitude 39° 40' 33.28". Longitude 105° 31' 20.66".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Grindal .....	78 43 19.32	258 36 51.74	4. 1691625
Democrat.....	103 18 06.18	283 09 57.48	4. 2724927
Kingston .....	150 10 40.31	330 05 45.85	4. 3425825
Central.....	169 12 35.68	348 11 22.98	4. 1219695
Sheepshead.....	200 31 44.57	20 35 47.52	4. 4102949
Douglas .....	218 06 25.13	38 11 14.11	4. 2412059
Bergen .....	275 32 07.38	95 37 01.06	4. 0420656
Legault.....	305 25 28.07	125 35 19.64	4. 4345086

DEMOCRAT, CLEAR CREEK COUNTY.

On Republican Mountain, 2 miles west of Georgetown. Point is best reached by following trail up first prominent gulch north of Georgetown, just at city limits. Follow this to summit of mountain, thence south along ridge to highest point. Elevation, 12,393 feet.

Station mark: Rock monument, 4 feet at base and 4 feet high.

Reference mark: Bronze triangulation tablet cemented in solid rock nearly at highest point of mountain; true azimuth from station, 32° 52'; distance, 6 feet.

[Latitude 39° 42' 52.29". Longitude 105° 44' 05.81"-]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Kingston .....	206 04 56.09	26 08 11.11	4. 2169623
Chief.....	283 09 57.48	103 18 06.18	4. 2724927

GRINDAL, CLEAR CREEK COUNTY.

On the first high point above timber line on Sugarloaf Mountain, and about 5 miles south of Georgetown.

Station mark: A rock monument, 4 feet diameter at base and 4 feet high.

Reference mark: A bronze triangulation tablet cemented in solid rock; true azimuth, 281° 17'; distance, 7.6 feet from station mark.

[Latitude 39° 38' 59.23". Longitude 105° 41' 27.89".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Kingston .....	189 01 21.28	9 02 55.18	4. 3475797
Chief.....	258 36 51.74	78 43 19.32	4. 1691625

DOUGLAS, GILPIN COUNTY.

On mountain of that name 1½ miles south of Golden and Black Hawk road, and 4 miles east of Central City.

Station mark: A bronze triangulation tablet cemented in solid rock nearly at highest point of mountain.

[Latitude 39° 47' 57.64". Longitude 105° 23' 48.61".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Chief.....	38 11 14.11	218 06 25.13	4.2412059
Central.....	86 53 43.59	266 47 41.46	4.1297204
Kingston.....	104 00 33.00	283 50 48.67	4.3494042
Sheepshead.....	170 35 28.61	350 34 42.24	4.0220084
North Table Mountain.....	272 49 15.28	92 56 48.25	4.2268302
Mount Morrison.....	313 24 12.51	133 31 01.26	4.3217667
Legault.....	338 55 23.94	159 00 27.74	4.4997715
Bergen.....	359 15 38.56	179 15 43.68	4.1695654

CENTRAL, ON GILPIN-CLEAR CREEK COUNTY LINE.

On mountain locally known as Bald Mountain, 1½ miles west of Nevada.

Station mark: A bronze triangulation tablet cemented in solid sandstone on summit. Elevation 9,993 feet above sea.

[Latitude 39° 47' 33.58". Longitude 105° 33' 14.38".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Kingston.....	126 37 55.99	306 34 14.01	4.0115544
Douglas.....	266 47 41.46	86 53 43.59	4.1297204
Chief.....	348 11 22.98	168 12 35.68	4.1219695

KINGSTON, ON GILPIN-CLEAR CREEK COUNTY LINE.

On mountain of same name, 12,137 feet above sea and 2 miles east of James Peak. Station is best reached by going via wagon road to Yankee post-office from Central City or Idaho, thence as locally directed.

Station mark: A bronze triangulation tablet, over which was erected a rock cairn 5 feet in diameter at base and 6 feet high.

[Latitude 39° 50' 52.123". Longitude 105° 39' 01.03".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	
	<i>Meters.</i>						
Grindal .....	9	02	55.18	189	01	21.28	4.3475797
Democrat .....	26	08	11.11	206	04	56.09	4.2169623
Sheepshead .....	255	52	24.18	76	01	22.68	4.3134460
Douglas .....	283	50	48.67	104	00	33.00	4.3494042
Central .....	306	34	14.01	126	37	55.99	4.0115544
Chief .....	330	05	45.85	150	10	40.31	4.3425825

## BERGEN, JEFFERSON COUNTY.

On mountain of same name, about 5 miles northwest of Evergreen post-office. Elevation about 9,000 feet.

Station mark: A pine tree 15 feet high and 6 inches in diameter.

Reference mark: A bronze bench-mark tablet set in a sloping sandstone rock on north edge of hill at highest point; true azimuth from station, 181° 23'; distance, 8.67 feet.

[Latitude 39° 39' 58.57". Longitude 105° 23' 40.61".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	
	<i>Meters.</i>						
Chief .....	95	37	01.06	275	32	07.38	4.0420656
Douglas .....	179	15	43.68	359	15	38.56	4.1695654
North Table Mountain .....	230	02	58.89	50	10	26.11	4.3367978
Morrison .....	268	37	48.10	88	44	31.17	4.1776792
Legault .....	322	47	21.27	142	52	19.92	4.2666761

## LEGAULT, JEFFERSON COUNTY.

On mountain of same name 3 miles east of Conifer post-office.

Station mark: A pine tree 6 inches in diameter, 12 feet high, on highest point of mountain, 9,000 feet above sea.

Reference mark: A bronze triangulation tablet set in solid sandstone rock at highest point; true azimuth from station, 193° 05'; distance, 3 feet 2½ inches.

[Latitude 39° 32' 01.11". Longitude 105° 15' 52.68".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	
	<i>Meters.</i>						
Chief .....	125	35	19.64	305	25	28.07	4.4345086
Bergen .....	142	52	19.92	322	47	21.27	4.2666761
Douglas .....	159	00	27.74	338	55	23.94	4.4997715



## MORRISON, JEFFERSON COUNTY.

A secondary station of the United States Coast and Geodetic Survey, on mountain of the same name about 3 miles northwest of the town of Morrison.

Station mark: A drill hole,  $\frac{3}{4}$ -inch in diameter and 4 inches deep, in the rock at the summit.

Reference mark: The point occupied by the theodolite, which is marked by a copper bolt stamped U. S. G. S. with arrow pointing to station mark; true azimuth from station,  $311^{\circ} 41'$ ; distance, 10.27 feet.

[Latitude  $39^{\circ} 40' 09.76''$ . Longitude  $105^{\circ} 13' 09.17''$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
South Boulder Peak .....	168 43 28.06	348 40 34.18	4.5178904
Table Mountain .....	186 49 08.91	6 49 52.54	4.1360412
Westminster .....	214 43 19.52	34 50 36.11	4.4543863
Capitol .....	248 49 46.59	68 58 46.78	4.3342863
Observatory .....	268 01 26.49	88 11 39.60	4.3598734
Indian Mound .....	271 26 55.18	91 51 12.57	4.7360113
Schweiger .....	298 50 33.23	119 03 56.80	4.5363141
Round Hill .....	298 43 03.78	119 04 29.83	4.7410023
Riley Hill .....	309 09 15.78	129 20 32.67	4.5151358
Table Mound .....	310 54 28.00	131 18 59.6	4.8662580
Raspberry .....	331 07 06.42	151 19 15.07	4.7555794
Douglas .....	133 31 01.26	313 24 12.51	4.3217667
Bergen .....	88 44 31.17	268 37 48.10	4.1776792

## SHEEPSHEAD, JEFFERSON COUNTY.

On eastern one of the group known as Ralston Buttes, 450 feet south-east of highest point of mountain and 50 feet east of bare rocky point.

Station mark: A bronze triangulation tablet set in a solid flat rock between two very large boulders.

[Latitude  $39^{\circ} 53' 34.14''$ . Longitude  $105^{\circ} 25' 01.00''$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Chief .....	20 35 47.52	200 31 44.57	4.4102949
Kingston .....	76 01 22.68	255 52 24.18	4.3134460
Douglas .....	350 34 42.24	170 35 28.61	4.0220084

## TABLE MOUNTAIN, JEFFERSON COUNTY.

On the northeast part of North Table Mountain, 3 miles northeast of Golden.

Station mark: A copper bolt set in the flat basalt rock and stamped G. S.

U. Δ S.

[Latitude 39° 47' 30.14". Longitude 105° 12' 00.90%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Morrison .....	6 49 52.54	186 49 08.97	4.1360412
South Boulder Peak .....	156 42 54.86	336 39 17.06	4.3095850
Morgan .....	216 12 55.82	36 19 41.60	4.4051184
Westminster.....	236 04 39.29	56 11 12.72	4.2452124
Capitol.....	287 21 54.45	107 30 11.67	4.2876445
Douglas .....	92 56 48.25	272 49 15.28	4.2268302
Bergen .....	50 10 26.11	230 02 58.89	4.3367978

Gunnison, Hinsdale, and Ouray counties; Lake City quadrangle.

Mr. J. F. McBeth, assistant topographer, occupied four stations and located four points by intersections in June and July, 1903. Positions are given on the United States standard datum, and based upon Uncompahgre-Sneffels as located by the United States Coast and Geodetic Survey.

## ALPINE, GUNNISON COUNTY

(Not occupied.)

On west end of summit of small bare ridge at highest point of Alpine Plateau, sometimes locally called "Big Blue Ridge," 4½ miles in an air line northwest of Youman station on the Denver and Rio Grande Railroad, 12 miles north of Lake City.

Station mark: An aluminum bench-mark tablet cemented in solid rock.

[Latitude 38° 13' 11.90". Longitude 107° 20' 52.02%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Uncompahgre .....	31 16 34.7	211 12 21.6	4.2841915
Lake.....	36 16 05.4	156 19 56.2	4.3544223

LAKE, HINSDALE COUNTY.

On a flat-topped slide rock summit 3 miles east of the town of Lake City, 2 miles north of the Lake City and Creede wagon road, where this road reaches the divide at the head of Slum Gullion Creek, from which point it is reached on horseback.

Station mark: A bronze tablet cemented into solid rock.

[Latitude 38° 02' 00.29". Longitude 107° 14' 38.80%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Uncompahgre.....	102 38 39.2	282 30 36.9	4. 2913527
Sneffels.....			4. 6831490
Sherman.....	52 24 44.1	232 18 03.2	4. 3027316

NO. 5, HINSDALE COUNTY.

(Not occupied.)

On summit at northeast edge of large mesa, about 12 miles southeast of Lake City.

Station mark: A rock monument.

[Latitude 37° 57' 20.35". Longitude 107° 06' 09.22%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Lake.....			4. 1800108
Sherman.....			4. 4560829
Uncompahgre.....			4. 5323664

RIO GRANDE PYRAMID, HINSDALE COUNTY.

(Not occupied.)

A tall, sharp peak standing prominently higher than any other in its locality (Hayden Survey triangulation station), about 20 miles south of Uncompahgre Peak.

Station mark: A rock monument.

[U. S. standard: Latitude 37° 40' 47.55". Longitude 107° 23' 31.10". Hayden: Latitude 37° 40' 52.2". Longitude 107° 23' 19.2".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Sneffels .....			4. 7017823
Uncompahgre .....			4. 6426623
Lake .....			4. 6163674
Sherman .....			4. 4335574

SHERMAN, HINSDALE COUNTY.

On summit of dark quartzite peak about 1½ miles north of the abandoned town of Sherman, 1 mile southwest of Redcloud Peak, and at the head of the south fork of Silver Creek.

Station mark: A bronze tablet cemented in large fragment of rock, over which was erected a rock cairn 4½ feet high.

[Latitude 37° 55' 22.54". Longitude 107° 25' 30.24".]

To station—	Azimuth.	Back azimuth,	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Uncompahgre .....	169 01 03.2	348 59 42.2	4. 2261074
Sneffels .....	105 42 19.2	285 28 47.5	4. 5245571
Lake .....	232 18 03.2	52 24 44.1	4. 3027316

TABASCO, HINSDALE COUNTY.

(Not occupied.)

On highest summit about 5 miles northwest of the town of Sherman and about 2 miles south of the Tabasco mine.

Station mark: A rock monument.

[Latitude 37° 54' 47.25". Longitude 107° 30' 14.13".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Sneffels .....			4. 4351511
Uncompahgre .....			4. 2552210
Sherman .....			3. 8463457

## UNCOMPAGRE, HINSDALE COUNTY.

On summit of Uncompagre Peak, a station of the transcontinental triangulation of the United States Coast and Geodetic Survey.

Station mark: A cross cut in top of half-inch copper bolt, leaded into the solid rock under masonry pier for theodolite support. The circular stone ring wall, inner diameter 11 feet, was left standing.

[Latitude 38° 04' 18.42". Longitude 107° 27' 41.78%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Sneffels.....	75 32 46.6	255 20 34.1	4.4764217
Treasury Mountain.....	196 43 01.82	16 56 36.24	5.0387020
Mount Ouray.....	249 49 54.38	70 35 52.02	5.0611148
Lake.....	282 30 36.9	102 38 39.2	4.2913527
Sherman.....	348 59 42.2	169 01 03.2	4.2261074

## SNEFFELS, OURAY COUNTY.

About 1 mile west of the town of Ouray.

Station mark: A rock monument about 4 feet high on summit of peak.

[Latitude 38° 00' 14.28". Longitude 107° 47' 30.59%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Mesa.....	161 21 47.8	341 07 21.2	5.0215579
Uncompagre.....	255 20 34.1	75 32 46.6	4.4764215
Sherman.....	285 28 47.5	105 42 19.2	4.5245510

## MONTANA.

## TRIANGULATION STATIONS.

Choteau and Valley counties; Assiniboine, Bowdoin, Chinook, Dodson, Glasgow, Harlem, Havre, Hinsdale, Saco, Wayne Creek, Yantic, and other quadrangles.

During the season of 1902 an area of about 2,000 square miles in Choteau County was controlled by triangulation by Mr. J. T. Stewart under the supervision of Mr. H. L. Baldwin, jr. A base line 5.6 miles in length was measured along the railroad track near Burnham. From this base triangulation was extended northeastward to the Canadian boundary line and connected therewith. Azimuth observations were taken at one end of the base and also at Snake Butte. Twenty-five stations were occupied, controlling portions of four 30-minute quadrangles. This work was further extended eastward during the season

of 1903 by Messrs. Pearson Chapman and Fred McLaughlin, under the supervision of Mr. Baldwin. These observers, besides reoccupying five old stations, built and occupied thirty-five new stations and located twenty-two points by intersections. The latitude adopted is that of international boundary monument No. 318, corrected graphically for station error to the mean parallel or  $49^{\circ} 00' 04.90''$ , being about  $1.94''$  greater than the latitude computed from Bear Paw station.

The longitude depends upon the astronomic longitude of the school-house and church spire at Chinook, as determined by the United States Coast and Geodetic Survey in the fall of 1903.

#### BELKNAP, CHOTEAU COUNTY.

On the Fort Belknap Indian Reservation, on divide between Peoples and White Bear creeks, 300 feet south of ridge road to Fort Belknap Agency. This ridge is the first high ground south of Milk River, running about east and west, and the station is on the west end, overlooking White Bear bottom.

Station mark: An iron bench-mark post set 3 feet in the ground.

[Latitude  $48^{\circ} 21' 55.62''$ . Longitude  $108^{\circ} 28' 25.17''$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Snake Butte .....	96 35 18.99	276 19 38.58	4.4158428
Wayne .....	159 26 29.62	339 21 06.87	4.4007927
Mesa .....	176 05 16.01	356 03 59.60	4.4858407
Eureka .....	185 17 39.52	5 18 54.67	4.3484067
Dodson .....	242 54 54.17	63 09 12.35	4.4227012
East Belknap .....	291 54 25.39	112 02 47.44	4.1738547

#### BIG SANDY, CHOTEAU COUNTY.

(Not occupied.)

A prominent point on ridge 3 miles east of Big Sandy railroad station, 239 feet west of section corner, one-fourth mile northwest of wagon road.

Station mark: An iron bench-mark post set 36 inches in the ground.

[Latitude  $48^{\circ} 09' 46.49''$ . Longitude  $110^{\circ} 01' 49.14''$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Sage .....	153 36 02	333 29 29	4.38702
Square .....	202 55 39	23 00 25	4.30656
Box Elder schoolhouse .....			4.23651

## BOUNDARY POST NO. 318, CHOTEAU COUNTY.

Situated 9.8 feet south of monument No. 318 on line between United States and Canada. It is about 7 miles west of North Fork River. The boundary monument is composed of earth and rock and is about 10 feet in diameter and 3 feet high.

Station mark: An iron bench-mark post set 36 inches in the ground.

[Latitude 49° 00' 04.90". Longitude 109° 16' 39.51%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Forks .....	16 15 57.66	196 12 21.11	4.3207174
West Cherry .....	300 37 56.27	120 52 12.43	4.4295770
Fifteenmile .....	339 10 25.93	159 17 05.01	4.4835387

## BOX ELDER, CHOTEAU COUNTY.

On highest point of divide northeast of Little Box Elder Creek, about 3 miles southeast of Toledo, one-fourth mile west of wagon trail to Milk River, 2,592 feet northwest of quarter corner common to sections 14 and 23, T. 32 N., R. 17 E.

Station mark: Iron bench-mark post set 36 inches in the ground.

[Latitude 48° 31' 45.99". Longitude 109° 29' 42.69%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Squaw .....	81 04 44.04	260 54 18.97	4.2389816
Saddle .....	84 25 53.22	264 19 38.45	4.0133845
Pepin .....	140 58 16.42	320 52 56.78	4.1418483
Walker .....	183 01 54.62	3 02 34.38	4.3113019
Yantic .....	215 56 24.57	36 03 08.34	4.2733973
Chinook .....	290 05 16.98	110 16 01.32	4.2745474

## BOX ELDER SCHOOLHOUSE, CHOTEAU COUNTY.

(Not occupied.)

[Latitude 48° 19' 03.58". Longitude 110° 00' 58.36%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Big Sandy .....			4.23651
Sage .....			4.10570

BURNHAM, CHOTEAU COUNTY.

(Not occupied.)

Station mark: Center of water tank at Burnham.

[Latitude 48° 33' 44.24". Longitude 109° 53' 20.03%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	o ' "	o ' "	<i>Meters.</i>
Red Rock .....			4. 09517
East Base .....			3. 02447

CHAIN, CHOTEAU COUNTY.

On a prominent hill 1 mile east of east end of Chain Lake, about 1 mile northeast of the wagon road which runs from Havre via Burnham on the high land up and along the west side of Milk River, about 8 miles northwest of Burnham and 6 miles north of Great Northern Railroad.

Station mark: An iron bench-mark post set 36 inches in the ground.

[Latitude 48° 38' 47.39". Longitude 110° 00' 49.85%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	o ' "	o ' "	<i>Meters.</i>
West Base .....	5 52 09.70	185 51 37.91	3. 9291630
Mileboard 984 .....	58 06 05.27	237 59 05.28	4. 1307931
Red Rock .....	258 18 23.15	78 26 06.87	4. 1107852
East Base .....	318 54 47.70	138 59 46.41	4. 0942557

CHINOOK, CHOTEAU COUNTY.

On a grassy hill, about 8 miles south of Chinook, on divide east of telephone road, one-half mile west of Chinook road.

Station mark: An iron bench-mark post set 36 inches in the ground.

[Latitude 48° 28' 15.86". Longitude 109° 15' 22.34%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	o ' "	o ' "	<i>Meters.</i>
Box Elder .....	110 16 01.32	290 05 16.98	4. 2745474
Yantic .....	163 05 34.06	343 01 32.64	4. 3552089
North Fork .....	195 50 46.31	15 54 13.56	4. 3164741
Zurich .....	228 16 41.26	48 29 15.23	4. 4407869
Snake Butte .....	285 12 54.68	105 32 21.21	4. 5216736



## CHINOOK SCHOOLHOUSE, CHOTEAU COUNTY.

(Not occupied.)

[Latitude 48° 35' 29.36". Longitude 109° 13' 42.43".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Chinook .....			4. 13183
Box Elder .....			4. 31939

## COBURG WATER TANK, CHOTEAU COUNTY.

(Not occupied.)

Station mark: Center of railroad water tank.

[Latitude 48° 26' 23.97". Longitude 108° 21' 14.15".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
East Belknap .....			4. 168285
Belknap .....			4. 084094

## CONE, CHOTEAU COUNTY.

(Not occupied.)

[Latitude 48° 22' 29.80". Longitude 108° 51' 19.44".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Snake .....			3. 48288
Chinook .....			4. 49876

## DODSON, CHOTEAU COUNTY.

On a rolling prairie hill 6 miles north of Dodson post-office.

Station mark: An iron bench-mark post set 3 feet in ground.

[Latitude 48° 28' 24.17". Longitude 108° 09' 17.91".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
East Belknap .....	29 07 15.03	209 01 19.69	4. 3086544
Belknap .....	63 09 12.35	242 54 54.17	4. 4227012
Eureka .....	115 31 28.34	295 18 24.04	4. 3763025
Mesa .....	126 01 01.09	305 45 24.62	4. 4999560
Three Buttes .....	284 35 13.43	104 41 57.55	4. 0597848
Malta .....	317 16 41.69	137 28 31.93	4. 4604733

## EAST BASE, CHOTEAU COUNTY.

At east end of Burnham base line, one-half mile west of Burnham section house on Great Northern Railroad right of way, 80 feet south of track, on small knoll near west end of curve.

Station mark: An iron bench-mark post set in a cubic yard of cement; top of post projecting 3 inches above ground.

Reference marks: Bench-mark posts set 3 feet in ground at right angles to and on prolongation of base line, 20 feet distant from station mark.

[Latitude 48° 33' 44.05". Longitude 109° 54' 11.63%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Square Butte.....	3 24 17.53	183 23 21.86	4.4116023
West Base.....	95 51 27.58	275 45 57.27	3.9580732
Chain.....	138 59 46.41	318 54 47.70	4.0942557
Red Rock.....	200 33 27.52	20 36 12.18	4.1067880
Squaw.....	295 58 40.57	116 06 36.03	4.1610340

## EAST BELKNAP, CHOTEAU COUNTY.

On highest point of land about 4 miles south of Milk River and one-fourth mile east of east boundary of the Fort Belknap Indian Reservation.

Station mark: An iron bench-mark post set 36 inches in the ground.

[Latitude 48° 18' 54.83". Longitude 108° 17' 13.17%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Belknap.....	112 02 47.44	291 54 25.39	4.1738547
Eureka.....	157 08 46.25	337 01 38.53	4.4796513
Dodson.....	209 01 19.69	29 07 15.03	4.3036544
Three Buttes.....	234 48 03.29	55 00 42.61	4.4072741
Malta.....	276 57 02.92	97 14 47.12	4.4713432

## EAST CHERRY, CHOTEAU COUNTY.

On the south ridge of the Cherry Patch Hills, known as East Cherry Patch, on highest part of southwest point near break-off, about 4 miles east of Thirtymile Creek, three-fourths of a mile west of Harlem wagon road.

Station mark: An iron post set 30 inches in the ground.

[Latitude 48° 43' 56.42". Longitude 108° 49' 47.45".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Zurich .....	45 18 03.65	225 11 26.32	4.1829020
Fifteenmile .....	93 51 47.45	273 38 13.95	4.3455558
Snake Butte .....	359 14 39.37	179 14 57.57	4.5783100

## EUREKA, CHOTEAU COUNTY.

On western side of divide between Eureka and Dodson creeks, overlooking the valley of Savoy Creek, and about 1 mile northeast of the head of Eureka Creek or Coulee. A rather dim road runs to Coburg, about 2 miles southwest of triangulation point.

Station mark: An iron bench-mark post set 32 inches in ground.

[Latitude 48° 33' 54.65". Longitude 108° 26' 44.79".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Belknap .....	5 18 54.67	185 17 39.52	4.3484067
Snake Butte .....	55 29 38.24	235 12 41.20	4.5303454
Wayne .....	97 05 42.24	276 59 03.73	4.0405474
Mesa .....	153 32 58.70	333 30 26.88	3.9685886
Dodson .....	295 18 24.04	115 31 28.34	4.3763025
East Belknap .....	337 01 38.53	157 08 46.25	4.4796513

## FIFTEENMILE, CHOTEAU COUNTY.

On highest point of divide between heads of Fifteenmile and Coal creeks, 752.9 feet northeast of corner common to sections, 1 mile northwest of wagon road to Chinook via Gibbs ranch.

Station mark: An iron bench-mark post set 36 inches in ground.

[Latitude 48° 44' 43.34". Longitude 109° 07' 49.65".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
North Fork .....	18 50 38.60	198 48 26.23	4.0479153
Yantic .....	60 56 47.36	240 47 05.33	4.2584864
Forks .....	116 44 32.75	296 34 18.06	4.2710728
Boundary 318 .....	159 17 05.01	339 10 25.93	4.4835387
West Cherry .....	219 57 02.98	40 04 38.77	4.2837150
East Cherry .....	273 38 13.95	93 51 47.45	4.3455558
Zurich .....	317 02 48.73	137 09 44.28	4.2206852

FOGERTY, CHOTEAU COUNTY.

On divide between Fogerty and Thirtymile Creek, 6 miles north-northwest of Harlem, about one-half mile west of wagon road.

Station mark: An iron bench-mark post set 36 inches in the ground.

[Latitude 48° 36' 43.37". Longitude 108° 49' 03.91".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Snake Butte .....	0 55 35.90	180 55 21.48	4. 3890661
Zurich .....	102 47 40.58	282 40 31.01	4. 0798706
East Cherry .....	176 12 11.30	356 11 29.66	4. 1273234
Prairie .....	231 30 21.08	51 37 19.99	4. 1637621
Wayne .....	283 03 56.47	103 14 02.23	4. 2303029

FORKS, CHOTEAU COUNTY.

On divide between West Fork and North Fork, about 1 mile north-west of junction of East Fork with North Fork, 2 miles northwest of Link's ranch, 1 mile west of North Fork wagon road.

Station mark: An iron bench-mark post set 36 inches in the ground.

[Latitude 48° 49' 14.46". Longitude 109° 21' 26.86".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Walker .....	37 11 33.72	217 06 00.70	4. 1753922
Boundary 318 .....	196 12 21.11	16 15 57.66	4. 3207174
West Cherry .....	257 30 53.87	77 48 45.24	4. 4726699
Fifteenmile .....	296 34 18.06	116 44 32.75	4. 2710728
North Fork .....	325 16 22.90	145 24 24.70	4. 3623141
Yantic .....	357 06 22.02	177 06 53.97	4. 2361690

FORT ASSINNIBOINE, CHOTEAU COUNTY.

(Not occupied.)

Station mark: Center of water tank at Fort Assinniboine.

[Latitude 48° 29' 58.61". Longitude 109° 47' 36.56".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
West base .....			4. 27575
Red Rock .....			4. 28498

## FORT BELKNAP WATER TANK, CHOTEAU COUNTY.

(Not occupied.)

Station mark: Center of tank.

[Latitude 48° 29' 08.24". Longitude 108° 46' 02.92'.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	' "	<i>Meters.</i>
Snake Butte .....			4. 049709
Prairie .....			4. 387029
Wayne .....			4. 215074

## HARLEM CHURCH, CHOTEAU COUNTY.

(Not occupied.)

Station mark: Center of Methodist Church spire.

[Latitude 48° 31' 59.04". Longitude 108° 46' 57.26'.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Snake Butte .....			4. 203903
Belknap .....			4. 469670
Savoy .....			4. 278939

## HAVRE, CHOTEAU COUNTY.

(Not occupied.)

Station mark: Center of roundhouse chimney at Havre.

[Latitude 48° 33' 15.12". Longitude 109° 39' 52.33'.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Saddle .....			3. 64170
Squaw .....			3. 85449

## LITTLE ROCKIES (SULLIVAN PEAK), CHOTEAU COUNTY.

(Not occupied.)

[Latitude 47° 59' 39.07". Longitude 108° 35' 44.7".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Belknap.....			4. 672573
Dodson.....			4. 796155
West Fork.....			4. 891750
Malta.....			4. 788578

## MILE BOARD 984, CHOTEAU COUNTY.

On top of ridge 2 miles east of Xenia siding, 400 feet northwest of mile board 984, on Great Northern Railroad, on small knoll 300 feet north of railroad track. Wagon road runs south of railroad.

Station mark: An iron bench-mark post set 34 inches in the ground.

[Latitude 48° 34' 55.83". Longitude 110° 10' 09.64".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Chain.....	237 59 05.28	58 06 05.27	4. 1307931
Red Rock.....	247 51 07.90	68 05 51.47	4. 4151518
West Base.....	276 55 17.82	97 01 45.79	4. 0287844
Square.....	326 55 15.82	147 06 17.17	4. 5230478

## MESA, CHOTEAU COUNTY.

On edge of a rise in Cherry Patch Ridge, about 2 miles north of East Fork of Savoy Creek and 3 miles north of Black Butte.

Station mark: An iron bench-mark post set 34 inches in the ground.

[Latitude 48° 38' 24.22". Longitude 108° 30' 07.18".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Wayne.....	44 02 01.45	223 57 54.55	3. 9870088
Dodson.....	305 45 24.62	126 01 01.09	4. 4999560
Eureka.....	333 30 26.88	153 32 58.70	3. 9685886
Belknap.....	356 03 59.60	176 05 16.01	4. 4858407

## MILK RIVER BRIDGE, CHOTEAU COUNTY.

(Not occupied.)

East of Zurich, a station on the Great Northern Railroad.  
Station mark: Center of bridge.

[Latitude 48° 33' 20.21". Longitude 108° 57' 06.27".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Chinook.....			4.387024
Snake Butte.....			4.312804

## NORTH FORK, CHOTEAU COUNTY.

On highest point of bench 2½ miles east of North Fork River, about 6 miles northeast of Chinook, about 3 miles southeast of Gibbs's ranch, and 2,459 feet south of township corner.

Station mark: An iron bench-mark post set 36 inches in the ground.

[Latitude 48° 39' 01.19". Longitude 109° 10' 45.86".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Chinook.....	15 54 13.56	195 50 46.31	4.3164741
Yantic.....	98 09 01.00	278 01 31.68	4.0924138
Forks.....	145 24 24.70	325 16 22.90	4.3623141
Fifteenmile.....	198 48 26.23	18 50 38.60	4.0479153
West Cherry.....	212 11 13.47	32 21 01.45	4.4757747
Zurich.....	276 04 16.10	96 13 23.61	4.1766183

## PEPIN, CHOTEAU COUNTY.

About 6 miles northeast of Havre, on divide between Red Rock Coulee and Milk River. In Pepin's pasture, near east fence, 4 miles east of Havre and Lake Thibideau wagon road.

Station mark: An iron bench-mark post set 36 inches in the ground.

[Latitude 48° 37' 34.40". Longitude 109° 36' 48.99".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Saddle .....	7 20 27.45	187 19 32.01	4. 0744270
Squaw .....	31 52 37.91	211 47 31.96	4. 2003833
Red Rock .....	106 09 48.02	285 59 30.12	4. 2439166
Thibideau .....	186 19 06.28	6 20 13.52	4. 2202759
Walker .....	225 17 52.23	45 23 52.10	4. 1393886
Box Elder .....	320 52 56.78	140 58 16.42	4. 1418483

PIKES PEAK, CHOTEAU COUNTY.

(Not occupied.)

Station mark: Center of summit.

[Latitude 47° 56' 23.6". Longitude 108° 31' 38.7".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Dodson .....			4. 81600
Malta .....			4. 78384

PRAIRIE, CHOTEAU COUNTY.

Near center sec. 24, T. 34 N., R. 23 E., about 12 miles north of Harlem, Montana.

Station mark: An iron bench-mark post set 3 feet in ground.

[Latitude 48° 41' 36.79". Longitude 108° 39' 45.91".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Fogerty .....	51 37 19.99	231 30 21.08	4. 1637621
East Cherry .....	109 23 39.89	289 15 59.13	4. 1149395
Wayne .....	338 24 23.71	158 27 31.06	4. 1431148

RED ROCK, CHOTEAU COUNTY.

About 12 miles northwest of Havre, on a prominent knoll on divide between Milk River and Red Rock Coulee, about 5 miles north of Milk River and 0.6 mile south of Havre road, 273 feet east of corner, to secs. 25 and 36, T. 34 N., R. 14 E.

Station mark: An iron bench-mark post set 36 inches in the ground and marked "2945 Havre."



[Latitude 48° 40' 11.61". Longitude 109° 50' 32.16'.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
East Base.....	20 36 12.18	200 33 27.52	4.1067880
West Base.....	50 48 02.12	230 39 46.87	4.2420716
Mile board 984.....	68 05 51.47	247 51 07.90	4.4151518
Chain.....	78 26 06.87	258 18 23.15	4.1107852
Thibideau.....	237 55 17.03	58 06 42.90	4.3422807
Pepin.....	285 59 30.12	106 09 48.02	4.2439166
Squaw.....	335 03 58.81	155 09 10.08	4.3055702

SADDLE, CHOTEAU COUNTY.

A prominent rocky butte 3 miles southeast of Havre. Foot of butte is 1 mile northwest of wagon road from Havre to Little Box Elder Creek.

Station mark: A bronze triangulation tablet set in solid rock on highest part of butte.

[Latitude 48° 31' 13.28". Longitude 109° 38' 02.89'.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Squaw.....	76 04 47.02	256 00 36.68	3.8492805
Pepin.....	187 19 32.04	7 20 27.45	4.0744270
Box Elder.....	264 19 38.45	84 25 53.22	4.0133845

SAGE, CHOTEAU COUNTY.

(Not occupied.)

About 9 miles west of Box Elder railroad station, on small ridge on divide south of Sage Creek; 3 miles west of wagon road, 1½ miles west of deserted house.

Station mark: An iron bench-mark post set 36 inches in the ground.

[Latitude 48° 21' 33.12". Longitude 110° 10' 35.69'.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Mile board.....	181 14 01	1 14 21	4.39446
Square.....	279 31 43	99 43 03	4.27873
Big Sandy.....	333 29 29	153 36 02	4.38702

## SAVOY, CHOTEAU COUNTY.

On divide between White Bear Creek and Milk River, about 1,000 feet west of the road to Landusky. This divide is the eastern continuation of the divide of which Snake Butte is the summit.

Station mark: An iron bench-mark post set 3 feet in the ground.

[Latitude 48° 24' 06.05". Longitude 108° 37' 05.13%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Snake Butte .....			4. 182442
Eureka .....	214 57 22.3	35 05 07.3	4. 346351
Belknep .....	290 34 47.4	110 41 16.1	4. 058080

## SAVOY WATER TANK, CHOTEAU COUNTY.

(Not occupied.)

Station mark: Center of railroad water tank.

[Latitude 48° 28' 31.36". Longitude 108° 32' 43.34%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Belknep .....			4. 124710
Snake Butte .....			4. 353254

## SNAKE BUTTE, CHOTEAU COUNTY.

A prominent butte 10 miles south of Harlem on the Fort Belknep Indian Reservation. Wagon road runs from Harlem to spring at west end of butte.

Station mark: A bronze triangulation tablet cemented in a flat rock 20 feet long and 10 feet wide, on highest point of butte.

[Latitude 48° 23' 30.49". Longitude 108° 49' 23.17%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Chinook .....	105 32 21.21	285 12 54.68	4. 5216736
Zurich .....	157 21 13.10	337 14 18.62	4. 4686389
East Cherry .....	179 14 57.57	359 14 39.37	4. 5783100

## SQUARE BUTTE, CHOTEAU COUNTY.

On a high point near northwest rim of Square Butte, a prominent butte 4 miles northeast of Box Elder railroad station. A wagon road passes one-half mile northwest of foot of butte.

Station mark: An iron bench-mark post set 36 inches in the ground.

[Latitude 48° 19' 50.29". Longitude 109° 55' 26.02%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Mile board 984.....	147 06 17.17	326 55 15.82	4.5230478
West Base.....	164 16 59.51	344 12 25.44	4.4427027
East Base.....	183 23 21.86	3 24 17.53	4.4116023
Squaw.....	216 51 29.68	37 00 19.96	4.3848879

## SQUAW, CHOTEAU COUNTY.

A prominent rocky butte about 5 miles south of Havre and 3 miles east of Fort Assiniboine. Ryan's sheep ranch at the north foot of the butte is reached by wagon road from Havre.

Station mark: A bronze triangulation tablet cemented in solid rock on highest part of butte.

[Latitude 48° 30' 18.10". Longitude, 109° 43' 37.10%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Square Butte.....	37 00 19.96	216 51 29.68	4.3848879
East Base.....	116 06 36.03	295 58 40.57	4.1610340
Red Rock.....	155 09 10.08	335 03 58.81	4.3055702
Pepin.....	211 47 31.96	31 52 37.91	4.2003833
Saddle.....	256 00 36.68	76 04 47.02	3.8492805
Box Elder.....	260 54 18.97	81 04 44.04	4.2389816

## THIBIDEAU, CHOTEAU COUNTY.

On a prominent hill 1 mile northeast of Thibideau Lake, one-half mile east of Havre and Thibideau Lake wagon road.

Station mark: An iron bench-mark post set 36 inches in the ground.

[Latitude 48° 46' 28.72". Longitude 109° 35' 19.48%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Pepin.....	6 20 13.52	186 19 06.28	4.2202759
Red Rock.....	58 06 42.90	237 55 17.03	4.3422807
Walker.....	310 31 40.91	130 36 33.91	4.0204727

## THREE BUTTES, CHOTEAU COUNTY.

On highest northwest end of group of buttes, 10 miles northwest of Malta.

Station mark: An iron bench-mark post set 3 feet in the ground and surrounded by a rock cairn  $3\frac{1}{2}$  feet in diameter at base and 6 feet high.

Reference mark: Cross on granite rock 2 feet square and projecting 1 foot above ground; true azimuth to mark,  $201^{\circ} 49'$ ; distance, 6.30 feet.

[Latitude  $48^{\circ} 26' 50.25''$ . Longitude  $108^{\circ} 00' 17.47''$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
East Belknap .....	55 00 42.61	234 48 03.29	4.4072741
Dodson.....	104 41 57.55	284 35 13.43	4.0597848
West Fork.....	261 47 16.33	81 55 38.46	4.1437880
Remove.....	303 19 37.21	123 31 54.21	4.3856389
Hicks .....	327 11 28.88	147 19 36.16	4.3948424
Malta .....	335 16 11.57	155 21 17.70	4.3051098

## WALKER, CHOTEAU COUNTY.

A prominent swell on the divide between Red Rock Coulee and West Fork, about 6 miles southeast of Thibideau Lake,  $1\frac{1}{2}$  miles south of a grassy lake, one-fourth mile southwest of Chinook and Thibideau Lake wagon road.

Station mark: An iron bench-mark post set  $3\frac{1}{4}$  inches in the ground.

[Latitude  $48^{\circ} 42' 48.02''$ . Longitude  $109^{\circ} 28' 49.71''$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Box Elder.....	3 02 34.38	183 01 54.62	4.3113019
Pepin .....	45 23 52.10	225 17 52.23	4.1393886
Thibideau .....	130 36 33.91	310 31 40.91	4.0204727
Forks .....	217 06 00.70	37 11 33.72	4.1753922
Yantic .....	297 53 48.89	117 59 53.44	4.0506437

## WAYNE, CHOTEAU COUNTY.

Near center sec. 33, T. 33 N., R. 24 E., on divide between Wayne and Savoy creeks and 7 miles north of Savoy.

Station mark: An iron bench-mark post set 3 feet in the ground.

[Latitude 48° 34' 38.21". Longitude 108° 35' 36.29%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Snake Butte .....	39 32 59.15	219 22 40.00	4. 4267609
Fogerty .....	103 14 02.23	283 03 56.47	4. 2303029
Prairie .....	158 27 31.06	338 24 23.71	4. 1431148
Mesa .....	223 57 54.55	44 02 01.45	3. 9870088
Eureka .....	276 59 03.73	97 05 42.24	4. 0405474
Belknap .....	339 21 06.87	159 26 29.62	4. 4007927

## WEST BASE, CHOTEAU COUNTY.

On a prominent knoll 6 miles west of Burnham section house, 600 feet south of Great Northern Railroad track.

Station mark: An iron bench-mark post set in cubic yard of concrete, top of post projecting 3 inches above the ground.

Reference marks: Bench-mark posts set 3 feet in the ground at right angles to and on prolongation of the base line 20 feet distant from station mark.

[Latitude 48° 34' 13.82". Longitude 110° 01' 32.22%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Mile board 984 .....	97 01 45.79	276 55 17.82	4. 0287844
Chain .....	185 51 37.91	5 52 09.70	3. 9291630
Red Rock .....	230 39 46.87	50 48 02.12	4. 2420716
East Base .....	275 45 57.27	95 51 27.58	3. 9580732
Square Butte .....	344 12 25.44	164 16 59.51	4. 4427027

## WEST CHERRY, CHOTEAU COUNTY.

On the northwest butte of the Cherry Patch Ridge, about 250 feet east of the break-off at west end of ridge; can be reached from the south side by wagon.

Station mark: An iron post with bronze triangulation top set 36 inches in the ground.

[Latitude 48° 52' 39.83". Longitude 108° 57' 44.00".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
North Fork.....	32 21 01.45	212 11 13.47	4.4757747
Fifteenmile.....	40 04 38.77	219 57 02.98	4.2837150
Forks.....	77 48 45.24	257 30 53.87	4.4726699
Boundary 318.....	120 52 12.43	300 37 56.27	4.4295770

YANTIC, CHOTEAU COUNTY.

A grassy swell on divide between Red Rock Coulee and West Fork, about 8 miles northwest of Chinook and one-half mile southwest of wagon road which runs from Chinook northwestward near West Fork.

Station mark: An iron bench-mark post set 34 inches in the ground.

[Latitude 48° 39' 57.53". Longitude 109° 20' 44.36".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Box Elder.....	36 03 08.34	215 56 24.57	4.2733973
Walker.....	117 59 53.44	297 53 48.89	4.0506437
Forks.....	177 06 53.97	357 06 22.02	4.2361690
Fifteenmile.....	240 47 05.33	60 56 47.36	4.2584864
North Fork.....	278 01 31.68	98 09 01.00	4.0924138
Chinook.....	343 01 32.64	163 05 34.06	4.3552089

YANTIC TANK, CHOTEAU COUNTY.

(Not occupied.)

Station mark: Center of railroad water tank at Yantic.

[Latitude 48° 35' 29.08". Longitude 109° 24' 16.02".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Box Elder.....			3.98274
Saddle.....			4.27199

ZURICH, CHOTEAU COUNTY.

On divide between Thirtymile and Fifteenmile creeks, about 6 miles north of Zurich railroad station; about one-half mile west of Zurich wagon road and 1 mile southwest of Harlem wagon road.

Station mark: An iron bench-mark post set 36 inches in the ground.

[Latitude 48° 38' 09.12". Longitude 108° 58' 36.45".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Chinook.....	48 29 15.23	228 16 41.26	4.4407869
North Fork.....	96 13 23.61	276 04 16.10	4.1766183
Fifteenmile.....	137 09 44.28	317 02 48.73	4.2206852
East Cherry.....	225 11 26.32	45 18 03.65	4.1829020
Snake Butte.....	337 14 18.62	157 21 13.10	4.4686389

ASH, VALLEY COUNTY.

On prairie hill 3 miles south of Vandalia railroad station.  
 Station mark: An iron bench-mark post set 3 feet in the ground.

[Latitude 48° 20' 36.15". Longitude 106° 59' 16.59".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Peak.....	103 56 44.98	283 49 13.45	4.1076542
Rock Creek.....	162 31 24.79	342 26 28.90	4.4311067
Buggy.....	201 43 16.20	21 47 18.41	4.2544042
Vandalia.....	249 50 50.06	70 03 35.75	4.3509663
Tampico.....	283 59 31.08	104 05 42.83	4.0239072

ASHFIELD WATER TANK, VALLEY COUNTY.

(Not occupied.)

Station mark: Center of railroad water tank.

[Latitude 48° 25' 37.53". Longitude 107° 31' 19.03".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Remove.....			4.280582
Moraine.....			3.979367
Saco.....			4.115548

BEAVER, VALLEY COUNTY.

On prairie hill 12 miles south of Lake Bowdoin.  
 Station mark: An iron bench-mark post set 36 inches in the ground.

[Latitude 48° 14' 18.63". Longitude 107° 40' 29.45".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Rocky .....	86 36 12.70	266 32 15.65	3. 8176223
Hicks .....	101 59 34.59	281 52 54.75	4. 0531163
Remove .....	157 01 48.44	336 59 17.46	4. 0284139

BRAZIL, VALLEY COUNTY.

On flat prairie ridge 8 miles southwest of Glasgow.

Station mark: An iron bench-mark post set 3 feet in the ground.

[Latitude 48° 12' 16.96". Longitude 106° 52' 48.39".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Vandalia .....	209 29 40.84	29 37 35.83	4. 4243592
Chester .....	233 05 52.01	53 18 15.25	4. 4089996
Glasgow .....	265 43 15.66	85 55 09.74	4. 2972128

BUGGY, VALLEY COUNTY.

On gently sloping prairie hill 10 miles northeast of Hinsdale post-office and station, on Great Northern Railroad.

Station mark: An iron bench-mark post set 3 feet in the ground.

[Latitude 48° 29' 36.31". Longitude 106° 53' 52.78".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Ash .....	21 47 18.41	201 43 16.20	4. 2544042
Peak .....	54 35 26.67	234 23 52.34	4. 3698512
Rock Creek .....	121 35 43.98	301 26 45.05	4. 2382127
Vandalia .....	301 55 35.17	122 04 19.41	4. 2297322
Tampico .....	349 27 32.62	169 29 42.64	4. 2917641

CHESTER, VALLEY COUNTY.

On small prairie knob on south end of ridge, 11 miles northeast of Glasgow.

Station mark: An iron bench-mark post set 3 feet in the ground.



[Latitude 48° 20' 34.30". Longitude 106° 36' 12.52".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Glasgow .....	3 14 20.88	183 13 52.39	4. 1442242
Brazil .....	53 18 15.25	233 05 52.01	4. 4089996
Tampico .....	82 16 26.96	262 05 24.81	4. 2654875
Vandalia .....	136 20 23.76	316 15 54.80	4. 0300669
Porcupine .....	303 05 13.45	123 13 08.60	4. 1948931

## GLASGOW, VALLEY COUNTY.

On flat prairie 2 miles north of Glasgow.

Station mark: An iron bench-mark post set 3½ feet in the ground.

[Latitude 48° 13' 03.74". Longitude 106° 36' 50.68".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Willow .....	6 40 55.53	186 40 01.96	4. 1066538
Brazil .....	85 55 09.74	265 43 15.66	4. 2972128
Tampico .....	123 12 10.45	303 01 37.41	4. 3198313
Vandalia .....	163 01 32.99	342 57 32.79	4. 3551759
Vandalia (observed) .....	163 01 26.90		
Chester .....	183 13 52.39	3 14 20.88	4. 1442242
Porcupine .....	248 54 02.83	69 02 25.99	4. 1734807

## HICKS, VALLEY COUNTY.

On prominent hill 5 miles south of Malta.

Station mark: An iron bench-mark post set 3 feet in the ground.

[Latitude 48° 15' 34.31". Longitude 107° 49' 25.40".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Three Buttes .....	147 19 36.16	327 11 28.88	4. 3948424
West Fork .....	180 58 07.48	0 58 21.52	4. 3589656
Remove .....	222 31 27.14	42 35 36.26	4. 0072925
Beaver .....	281 52 54.75	101 59 34.59	4. 0531163
Rocky .....	301 13 51.93	121 16 34.63	3. 7212330

HINSDALE, VALLEY COUNTY.

On northwest summit of range of hills known as Larb Hills, and 4 miles southwest of Hinsdale post-office and station of the Great Northern Railroad.

Station mark: An iron bench-mark post set 3 feet in the ground.

[Latitude 48° 23' 35.95". Longitude 107° 12' 44.40'.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Short .....	74 33 00.28	254 21 46.14	4.2848144
Larb .....	91 01 07.73	270 48 47.51	4.3089235
Saco .....	132 55 55.47	312 46 13.86	4.3379786
Rock Creek .....	202 43 40.44	22 48 49.30	4.3401399
Peak .....	300 35 52.33	120 38 24.52	3.6873169
Square .....	358 42 41.48	178 42 49.94	4.0164066

HINSDALE WATER TANK, VALLEY COUNTY.

(Not occupied.)

Station mark: Center of railroad water tank.

[Latitude 48° 23' 38.08". Longitude 107° 05' 12.70'.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Hinsdale .....			3.968121
Rock Creek .....			4.303822
Buggy .....			4.250994

LARB, VALLEY COUNTY.

Near southeast corner SE. ¼ sec. 31, T. 31 N., R. 33 E., on north end of high prairie ridge 3 miles southeast of Ashfield station of the Great Northern Railroad.

Station mark: An iron bench-mark post set 3 feet in the ground.

[Latitude 48° 23' 46.48". Longitude 107° 29' 14.33".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Nemo .....	24 03 39.16	204 00 53.29	4. 0500023
Remove .....	66 58 08.46	246 47 12.74	4. 2931029
West Fork .....	107 27 19.29	287 12 27.30	4. 4095080
Moraine .....	153 38 43.72	333 35 01.71	4. 1372472
Hinsdale .....	270 48 47.51	91 01 07.73	4. 3089235
Saco .....	196 46 48.03	16 49 27.38	4. 1798441
Short .....	341 43 24.90	161 44 30.70	3. 7619111

## MALTA, VALLEY COUNTY.

Situating 4 miles south of Malta, on low mound west of road.

Station mark: An iron bench-mark post set 3 feet in the ground.

[Latitude 48° 16' 56.38". Longitude 107° 53' 27.82".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
East Belknap .....	97 14 47.12	276 57 02.92	4. 4713432
Dodson .....	137 28 31.93	317 16 41.69	4. 4604733
Three Buttes .....	155 21 17.70	335 16 11.57	4. 3051098
West Fork .....	194 47 40.98	14 50 56.25	4. 3225286
Remove .....	247 17 04.78	67 24 14.92	4. 1094006

## MISSOURI, VALLEY COUNTY.

On west end of ridge and 9 miles south of Glasgow.

Station mark: An iron bench-mark post set 3 feet in the ground.

[Latitude 48° 00' 43.32". Longitude 106° 34' 44.71".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Willow .....	158 04 56.93	338 02 29.75	4. 0400666
Porcupine .....	201 50 13.59	21 57 02.13	4. 4830632
Nashua .....	213 28 02.48	33 31 32.57	4. 0252679

## MORaine, VALLEY COUNTY.

On prairie hill 6 miles northwest of Ashfield station of the Great Northern Railroad, and in NE.  $\frac{1}{4}$  sec. 33, T. 32 N., R. 32 E.

Station mark: An iron bench-mark post set 3 feet in the ground.

[Latitude 48° 30' 24.29". Longitude 107° 34' 10.98".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Remove .....	30 54 03.31	210 46 48.93	4.3672291
West Fork .....	75 56 07.98	255 44 57.35	4.2779994
Saco .....	258 05 02.38	78 11 24.10	4.0287770
Larb .....	333 35 01.71	153 38 43.73	4.1372472
Nemo .....	356 05 36.79	176 06 32.64	4.3538616

NASHUA, VALLEY COUNTY.

On prairie ridge 6 miles east of Glasgow.

Station mark: An iron bench-mark post set 3 feet in the ground.

[Latitude 48° 05' 29.49". Longitude 106° 30' 02.26".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Missouri .....	33 31 32.57	213 28 02.48	4.0252679
Willow .....	97 41 32.75	277 35 35.26	4.0011852
Porcupine .....	195 48 25.16	15 51 43.45	4.3041769

NEMO, VALLEY COUNTY.

In NE.  $\frac{1}{4}$  sec. 3, T. 29 N., R. 32 E., on low ridge 2 miles east of Beaver Creek and 7 miles south of Bowdoin station on the Great Northern Railroad.

Station mark: An iron bench-mark post set 3 feet in the ground.

[Latitude 48° 18' 14.73". Longitude 107° 32' 56.31".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Remove .....	100 42 07.19	280 33 57.72	4.1379682
West Fork .....	131 58 25.83	311 46 20.38	4.4283085
Moraine .....	176 06 32.64	356 05 36.79	4.3538616
Larb .....	204 00 53.29	24 03 39.16	4.0500023
Short .....	233 16 30.62	53 20 22.18	3.9011360

PEAK, VALLEY COUNTY.

In sec. 10, T. 30 N., R. 35 E., on northern summit of range known as Larb Hills, and 3 miles southwest of Hinsdale.

Station mark: An iron bench-mark post set 3 feet in the ground.

[Latitude 48° 22' 15.68". Longitude 107° 09' 20.82".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Square .....	26 37 49.45	206 35 25.83	3.9464286
Hinsdale .....	120 38 24.52	300 35 52.33	3.6873169
Rock Creek .....	190 42 04.11	10 44 40.50	4.3628765
Buggy .....	234 23 52.34	54 35 26.67	4.3698512
Ash .....	283 49 13.45	103 56 44.98	4.1076542

PORCUPINE, VALLEY COUNTY.

On ridge one-half mile west of Porcupine Creek and 11 miles east of Glasgow.

Station mark: An iron bench-mark post set 3 feet in the ground.

[Latitude 48° 15' 56.97". Longitude 106° 25' 36.17".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Nashua .....	15 51 43.45	195 48 25.16	4.3041769
Missouri .....	21 57 02.13	201 50 13.59	4.4830632
Willow .....	40 35 03.05	220 25 46.76	4.3754135
Glasgow .....	69 02 25.99	248 54 02.83	4.1734807
Chester .....	123 13 08.60	303 05 13.45	4.1948931

REMOVE, VALLEY COUNTY.

On high prairie ridge about 6 miles east of Malta.

Station mark: An iron bench-mark post set 3 feet in the ground.

[Latitude 48° 19' 36.82". Longitude 107° 43' 51.72".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Rocky .....	13 08 15.74	193 06 49.45	4.0209973
Hicks .....	42 35 36.26	222 31 27.14	4.0072925
Malta .....	67 24 14.92	247 17 04.78	4.1094006
Three Buttes .....	123 31 54.21	303 19 37.21	4.3856389
West Fork .....	157 10 05.28	337 06 09.80	4.2219402
Moraine .....	210 46 48.93	30 54 03.32	4.3672291
Larb .....	246 47 12.74	66 58 08.46	4.2931029
Nemo .....	280 33 57.72	100 42 07.19	4.1379682
Beaver .....	336 59 17.46	157 01 48.44	4.0284139

## ROCK CREEK, VALLEY COUNTY.

In SE.  $\frac{1}{4}$  sec. 35, T. 33 N., R. 35 E., on ridge running north and south and 12 miles north of Hinsdale.

Station mark: An iron bench-mark post set 3 feet in ground.

[Latitude  $48^{\circ} 34' 29.22''$ . Longitude  $107^{\circ} 05' 51.91''$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Peak .....	10 44 40.50	190 42 04.11	4. 3628765
Hinsdale .....	22 48 49.30	202 43 40.44	4. 3401399
Buggy .....	301 26 45.05	121 35 43.93	4. 2382127
Ash .....	342 26 28.90	162 31 24.79	4. 4311067

## ROCK MONUMENT, VALLEY COUNTY.

(Not occupied.)

Station mark: Center of monument.

[Latitude  $48^{\circ} 20' 34.31''$ . Longitude  $107^{\circ} 08' 58.05''$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Square .....	.....	.....	3. 813634
Hinsdale .....	.....	.....	3. 862882
Peak .....	.....	.....	3. 500498

## ROCK MONUMENT NO. 2, VALLEY COUNTY.

(Not occupied.)

On high point.

Station mark: Center of monument.

[Latitude  $48^{\circ} 30' 17.28''$ . Longitude  $107^{\circ} 53' 54.84''$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
West Fork .....	.....	.....	3. 868521
Three Buttes .....	.....	.....	4. 005730
Remove .....	.....	.....	4. 368258

## ROCKY, VALLEY COUNTY.

On rocky butte 5 miles west of Beaver Creek and 7 miles southeast of Malta.

Station mark: An iron bench-mark post set 3 feet in the ground.

[Latitude 48° 14' 05.90". Longitude 107° 45' 47.32".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Hicks .....	121 16 34.63	301 13 51.93	3.7212330
Remove .....	193 06 49.50	13 08 15.74	4.0209973
Beaver .....	266 32 15.65	86 36 12.70	3.8176223

## SACO, VALLEY COUNTY.

Near southwest corner of sec. 15, T. 32 N., R. 33 E., on flat prairie 6 miles northwest of Saco post-office, and 1 mile east of Hedger's ranch on Milk River.

Station mark: An iron bench-mark post set 3 feet in the ground.

[Latitude 48° 31' 35.40". Longitude 107° 25' 41.44".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Larb .....	16 49 27.38	196 46 48.03	4.1798441
Moraine .....	78 11 24.10	258 05 02.38	4.0287770
Rock Creek .....	257 27 50.00	77 42 41.60	4.3975770
Hinsdale .....	312 46 13.86	132 55 55.47	4.3379786

## SACO WATER TANK, VALLEY COUNTY.

(Not occupied.)

Station mark: Center of railroad water tank.

[Latitude 48° 27' 26.71". Longitude 107° 20' 36.81".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Rock Creek .....			4.349536
Hinsdale .....			4.080889

SHORT, VALLEY COUNTY.

On ridge 6 miles southeast of Ashfield station on the Great Northern Railroad.

Station mark: An iron bench-mark post set 3 feet in the ground.

[Latitude 48° 20' 48.80". Longitude 107° 27' 46.30".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Nemo .....	53 20 22.18	233 16 30.62	3.9011360
Larb .....	161 44 30.70	341 43 24.90	3.7619111
Hinsdale .....	254 21 46.14	74 33 00.28	4.2848144
Square .....	285 24 40.61	105 36 02.72	4.2905541

SQUARE, VALLEY COUNTY.

On ridge running west from Larb Hills and 8 miles southwest of Hinsdale.

Station mark: An iron bench-mark post set 3 feet in the ground.

[Latitude 48° 17' 59.82". Longitude 107° 12' 33.07".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Short .....	105 36 02.72	285 24 40.61	4.2905541
Hinsdale .....	178 42 49.94	358 12 41.48	4.0164066
Peak .....	206 35 25.83	26 37 49.45	3.9464286

T. 31 N., R. 33 E., ¼ SECTION CORNER, VALLEY COUNTY.

South side section 36.

[Latitude 48° 23' 44.6". Longitude 107° 29' 11.8".]

TAMPICO, VALLEY COUNTY.

On prairie 1 mile west of Tampico station on the Great Northern Railroad.

Station mark: An iron bench-mark post set 3 feet in the ground.



[Latitude 48° 19' 13.14". Longitude 106° 50' 58.93".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Ash .....	104 05 42.83	283 59 31.08	4. 0239072
Buggy .....	169 29 42.64	349 27 32.62	4. 2917641
Vandalia .....	226 31 55.80	46 38 29.40	4. 1738161
Chester .....	262 05 24.81	82 16 26.96	4. 2654875
Glasgow .....	303 01 37.41	123 12 10.45	4. 3198313
Willow .....	326 18 03.85	146 27 42.71	4. 4616288

## TAMPICO WATER TANK, VALLEY COUNTY.

(Not occupied.)

Station mark: Center of railroad water tank.

[Latitude 48° 18' 24.60". Longitude 106° 49' 24.87".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Vandalia .....			4. 168685
Chester .....			4. 225476

## TIGER BUTTE, VALLEY COUNTY.

(Not occupied.)

Station mark: Center of rocky peak.

[Latitude 48° 07' 36.13". Longitude 106° 31' 53.22".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Missouri .....			4. 121771
Willow .....			3. 906356
Chester .....			4. 39137

## VANDALIA, VALLEY COUNTY.

On ridge running east and west 6 miles north of Tampico station on the Great Northern Railroad.

Station mark: An iron bench-mark post set 3½ feet in the ground.

[Latitude 48° 24' 45.14". Longitude 106° 42' 12.31".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Brazil .....	29 37 35.83	209 29 40.84	4. 4243592
Tampico.....	46 38 29.40	226 31 55.80	4. 1738161
Ash .....	70 03 35.75	249 50 50.06	4. 3509663
Buggy .....	122 04 19.41	301 55 35.17	4. 2297322
Chester.....	316 15 54.80	136 20 23.76	4. 0300669
Glasgow .....	342 57 32.79	163 01 32.99	4. 3551759

## WEST FORK, VALLEY COUNTY.

On high bluff west of Milk River, 8 miles north of Malta.

Station mark: An iron bench-mark post set 3 feet in the ground.

[Latitude 48° 27' 54.10". Longitude 107° 49' 06.59".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Hicks .....	0 58 21.52	180 58 07.48	4. 3589656
Malta .....	14 50 56.25	194 47 40.98	4. 3225286
Three Buttes .....	81 55 38.46	261 47 16.33	4. 1437880
Moraine.....	255 44 57.35	75 56 07.98	4. 2779994
Larb .....	287 12 27.30	107 27 19.29	4. 4095080
Nemo .....	311 46 20.38	131 58 25.83	4. 4283085
Remove .....	337 06 09.80	157 10 05.28	4. 2219402

## WILLOW, VALLEY COUNTY.

On ridge running northwest and southeast and 4 miles south of Glasgow.

Station mark: An iron bench-mark post set 3 feet in the ground.

[Latitude 48° 06' 12.66". Longitude 106° 38' 02.58".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Tampico.....	146 27 42.71	326 18 03.85	4. 4616288
Glasgow.....	186 40 01.96	6 40 55.53	4. 1066538
Porcupine .....	220 25 46.76	40 35 03.05	4. 3754135
Nashua.....	277 35 35.26	97 41 32.75	4. 0011852
Missouri.....	338 02 29.75	158 04 56.93	4. 0400666

## OREGON.

## TRIANGULATION STATIONS.

Grant, Harney, and Malheur counties.

During the latter part of the season of 1903 Mr. C. F. Urquhart, topographer, extended triangulation south and east from stations Fields and Strawberry, previously developed from the Baker City base. In the progress of this work Mr. Urquhart occupied eighteen stations, which furnish control for eight 30-minute quadrangles.

## FIELDS, GRANT COUNTY.

On the highest bald summit at the head of Fields Creek; 10 miles southwest of Mount Vernon post-office and 7 miles south of John Day River. Follow trail up Fields Creek 8 miles, thence up steep ridge to left, leading to station. Best approached from the southwest side, as the ridges on the north side are very steep and rocky.

Station mark: Copper bolt cemented in solid rock; above it a rock cairn 5 feet in height.

[Latitude  $44^{\circ} 20' 20.60''$ . Longitude  $119^{\circ} 15' 35.18''$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Snow.....	25 01 34.28	204 51 37.89	4. 6542932
Strawberry.....	273 43 31.37	94 06 15.10	4. 6369569
Soda.....	318 13 49.6	138 26 36.9	4. 5651789
Baldy.....	322 34 36.70	142 52 42.36	4. 7576209
Silvies.....	336 10 56.3	156 20 14.4	4. 6456061
Long.....	204 59 59.38	25 08 58.54	4. 6030953
Greenhorn.....	232 46 42.57	53 16 01.50	4. 8409415
Dixie.....	241 24 35.94	61 51 09.39	4. 7570659
Strawberry.....	273 43 31.37	94 06 15.10	4. 6360569

## SILVIES, GRANT COUNTY.

(Not occupied.)

On the highest point on the timbered ridge, about 8 or 9 miles a little north of west from Silvies post-office. Station is probably in Grant County, but very near the Harney County line. It can be plainly seen from Silvies Valley and is easily reached on horseback.

Station mark: The lone signal tree, trimmed up.

[Latitude 43° 58' 29.18". Longitude 119° 02' 14.06".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Fields .....	156 20 14.4	336 10 56.3	4.6456061
Strawberry .....	214 10 06.9	34 23 28.2	4.6570964
Soda .....			4.1653220
Baldy .....			4.2465954
Trout .....			4.3534978
Burns .....			4.6557042

## SNOW, GRANT COUNTY.

Snow Mountain is in Grant County, very near the Harney County line. Station is on highest point of bald ridge and is well known locally as Snow Mountain, as there is generally a small bank of snow on the north side. It is at the source of Emigrant Creek, south fork of John Day River, or Silver Creek, and the waters of Crooked River. It is the highest point for a long distance south of the Strawberry Range. Can be easily ascended from almost any direction on horseback.

Station mark: A bronze triangulation tablet cemented in solid rock under a cairn 7 feet in diameter at base and 9 feet high.

[Latitude 43° 58' 15.34". Longitude 119° 29' 51.30".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Fields .....	204 51 37.89	25 01 34.28	4.6542932
Strawberry .....	238 25 45.71	58 58 21.19	4.8635558
Baldy .....	274 41 18.41	95 09 14.64	4.7328401
Trout .....	289 10 17.11	109 36 22.18	4.7276892
Burns .....	326 15 04.53	146 30 13.06	4.7246653

## SODA, GRANT COUNTY.

(Not adjusted.)

A secondary station on a low ridge about  $1\frac{1}{2}$  miles south from Soda Springs, an old deserted ranch, 4 miles from Seneca, on the Canyon City and Snow road, on the east side of Silvies River and not more than 1 mile from it. There are a number of fir and pine trees on the east side of ridge, but nothing in the way in other directions. Can ride on it from any direction.

Station mark: A bronze triangulation tablet cemented in solid rock under center of a cairn 6 feet in diameter at base and 7 feet high.

[Latitude 44° 05' 31.27''. Longitude 118° 57' 14.91'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Silvies .....			4. 1653220
Fields .....	138 26 36.9	318 13 49.6	4. 5651789
Strawberry .....	217 35 05.0	37 44 58.4	4. 4904901
Baldy .....			4. 3176197
Trout .....			4. 5038298

## STRAWBERRY, GRANT COUNTY.

The highest mountain in the southeastern portion of the county, 10 miles south of Prairie City, at the head of Strawberry Creek, easily ascended by a direct but steep trail on the north side. From Prairie City follow wagon road up Strawberry Creek to Street's ranch, thence follow wood road up the hollow  $1\frac{1}{2}$  miles to a "burn" leading up to the main ridge, thence up the main ridge to the summit. Station is at the southern end of the summit, which is covered with shaly rock.

Station mark: Copper bolt cemented in solid rock, above which is a rock cairn 6 feet in diameter and 6 feet high.

[Latitude 44° 18' 44.72''. Longitude 118° 43' 03.48'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Baldy .....	11 37 24.87	191 32 51.54	4. 6381680
Silvies .....	34 23 28.20	214 10 06.90	4. 6570964
Soda .....	37 44 58.40	217 35 05.00	4. 4904901
Snow .....	58 58 21.19	238 25 45.71	4. 8635558
Fields .....	94 06 15.10	273 43 31.37	4. 6369569
Ironside .....	279 12 09.23	99 36 26.77	4. 6714342
Castle Rock .....	306 55 21.49	127 17 39.55	4. 7283623
Malheur .....	328 09 30.46	148 22 02.92	4. 6595361
Long .....	146 28 49.47	326 15 00.78	4. 6737986
Dixie .....	193 19 13.09	13 22 59.47	4. 4907164
Greenhorn .....	195 20 07.05	15 26 37.25	4. 6658137
Elkhorn .....	222 25 36.41	42 52 37.29	4. 8764545
Black .....	237 44 10.12	58 14 08.19	4. 8254494

## BALDY, HARNEY COUNTY.

On a high, bald ridge on the east side of Silvies Valley and about 9 miles east from Silvies post-office. The point is known locally as Baldy and is the highest point on divide between Silvies River and Malheur

River. It can be reached easily on horseback from any direction, the best route being probably from the north side.

Station mark: A bronze triangulation tablet cemented in solid rock under center of a cairn 7 feet in diameter at base and 10 feet high.

[Latitude 43° 55' 45.09". Longitude 118° 49' 36.09".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Trout .....	15 04 02.42	195 02 13.11	4.1323179
Burns .....	32 03 03.28	211 50 21.29	4.6683085
Snow.....	95 09 14.64	274 41 18.41	4.7328401
Silvies.....			4.2465954
Fields.....	142 52 42.36	322 34 36.70	4.7576209
Soda.....			4.3176197
Strawberry.....	191 32 51.54	11 37 24.87	4.6381680
Castle Rock.....	258 28 31.63	78 55 17.68	4.7207802
Malheur.....	263 20 47.57	83 37 49.89	4.5193596
Crow.....	330 04 44.01	150 17 59.73	4.7145725

BURNS, HARNEY COUNTY.

On a rather flat ridge covered with sagebrush and scattering juniper trees, about 5 miles west from the town of Burns. Can ride or drive up wood road from Burns.

Station mark: Center of the trimmed juniper signal tree.

Reference mark: A bronze triangulation tablet cemented in solid rock; azimuth from station mark, 172° 33'; distance, 4.8 feet.

[Latitude 43° 34' 24.07". Longitude 119° 07' 57.95".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Snow.....	146 30 13.06	326 15 04.53	4.7246653
Silvies.....			4.6557042
Baldy .....	211 50 21.29	32 03 03.28	4.6683085
Trout .....	218 33 32.65	38 44 24.84	4.5296086
Crow.....	275 55 04.13	96 20 56.42	4.7064442

CROW, HARNEY COUNTY.

On the highest point of the "Crow Camp" Mountains; a round, bald hill at the head of Crane Creek and near the head of Stinkingwater Creek. It is about 3½ miles east from Joseph Rector's ranch, which is 28 or 30 miles east from Burns and 15 or 16 miles ESE. from Harney. It can be reached from any direction on horseback.

Station mark: A bronze triangulation tablet cemented in rock under center of a cairn 7 feet in diameter at base and 10 feet high.

[Latitude 43° 31' 27.96". Longitude 118° 30' 24.91".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Burns .....	96	20	56.42	275	55	04.13	4.7064442
Trout .....	137	30	38.28	317	15	34.51	4.6366070
Baldy .....	150	17	59.73	330	04	44.01	4.7145725
Malheur .....	188	22	46.97	8	26	29.57	4.6924064
Castle Rock .....	205	04	00.57	25	17	24.36	4.7858781
Westfall .....	223	03	02.02	43	25	18.23	4.8003972
Hunter .....	252	20	17.40	72	45	41.32	4.7157176

#### MALHEUR, HARNEY COUNTY.

On a high, bald mesa, except for a few small trees on south end, in northeast corner of Harney County, about 15 miles a little west of north from Drewsey, and about 17 miles a little north of west from Beulah. It is on the divide between the north fork and middle fork of Malheur River and near the head of the two west forks of Otis Creek. It is about 7 miles from Frederick's ranch on Otis Creek. The mesa is easy to ride on from any direction, though the country around is very rocky.

Station mark: A bronze triangulation tablet cemented in rock under center of a cairn 7 feet in diameter at base and 11 feet high.

[Latitude 43° 57' 46.57". Longitude 118° 25' 02.97".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Crow .....	8	26	59.57	188	22	46.97	4.6924064
Trout .....	65	19	29.70	245	00	39.13	4.6032876
Baldy .....	83	37	49.89	263	20	47.57	4.5193596
Strawberry .....	148	22	02.92	328	09	30.46	4.6595361
Ironside .....	215	36	48.44	35	48	29.41	4.5841093
Castle Rock .....	250	37	11.87	70	46	55.24	4.2973222
Westfall .....	274	09	33.44	94	28	11.56	4.5566126
Hunter .....	307	57	33.11	128	19	20.26	4.7296034

#### TROUT, HARNEY COUNTY.

On a high, bald mountain, with timber almost to the top, on the east side and near the head of Trout Creek. Road from Silvies Valley to the head of Trout Creek passes about 3 miles a little south of west from station to a ranch, thence up a dry creek bed to signal.

Station mark: A bronze triangulation tablet cemented in rock under center of a cairn 7 feet in diameter at base and 10 feet high.

[Latitude  $43^{\circ} 48' 40.75''$ . Longitude  $118^{\circ} 52' 13.82''$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Burns .....	38 44 24.84	218 33 32.65	4. 5296086
Snow .....	109 36 22.18	289 10 17.11	4. 7276892
Silvies .....			4. 3534978
Soda .....			4. 5038298
Baldy .....	195 02 13.11	15 04 02.42	4. 1323179
Malheur .....	245 00 39.13	65 19 29.70	4. 6032876
Crow .....	317 15 34.51	137 30 38.28	4. 6366070

#### CASTLE ROCK, MALHEUR COUNTY.

Station is on a very prominent and well-known mountain, about 10 miles north from Beulah post-office and about 4 miles northeast from Harkness's ranch, on the north fork of Malheur River, 8 miles above Beulah. Mountain is easily ascended on horseback to within about 200 feet of top; thence is a rather steep ascent on foot.

Station mark: A bronze triangulation tablet cemented in rock under center of a cairn 7 feet in diameter at base and 9 feet high.

[Latitude  $44^{\circ} 01' 18.92''$ . Longitude  $118^{\circ} 11' 03.07''$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Crow .....	25 17 24.36	205 04 00.57	4. 7858781
Malheur .....	70 46 55.24	250 37 11.87	4. 2973222
Baldy .....	78 55 17.68	258 28 31.63	4. 7207802
Strawberry .....	127 17 39.55	306 55 21.49	4. 7283623
Ironside .....	188 34 43.63	8 36 40.14	4. 3960190
Dry Creek .....	248 21 59.52	68 43 43.74	4. 6512299
Westfall .....	298 15 06.99	118 24 02.47	4. 2905738
Hunter .....	329 21 37.82	149 33 43.89	4. 6635390

#### DRY CREEK, MALHEUR COUNTY.

Station is on highest point of high bald ridge on divide between Willow Creek and Clover Creek. It is at the head of east fork of Dry Creek, a tributary of Bully Creek, and about 15 miles north from Westfall. Juniper Mountain, a well-known point, is about 5 miles WNW. from station. Ridge can be easily ascended on horseback from almost any direction, though it is rather steep from the Willow Creek side.



Station mark: A bronze triangulation tablet cemented in rock under center of a cairn 7 feet in diameter at base and 10 feet high.

[Latitude 44° 10' 09.71". Longitude 117° 39' 48.80%.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	
Hunter.....	18	16	27.97	198	06	55.00	4.7710334
Westfall.....	43	51	41.90	223	38	54.85	4.5503162
Castle Rock.....	68	43	43.74	248	21	59.95	4.6512299
Ironside.....	102	24	47.63	282	04	57.48	4.5886244
Weiser.....	259	42	07.91	80	14	00.95	4.7912617
Vale.....	300	40	45.38	120	59	58.66	4.6332245
Grass.....	353	35	54.59	173	39	24.59	4.7846403

#### GRASS, MALHEUR COUNTY.

On a high, bald ridge about midway between Malheur and Owyhee rivers. The Vale and Skull Spring road passes 3 or 4 miles west from station at a point a little more than halfway from Vale. There is a spring about 3 miles east from station, the only water found, the country being very dry. The spring is sometimes known as "Freezeout" Spring, and the ridge is sometimes spoken of as "Freezeout" Hills.

Station mark: A bronze triangulation tablet cemented in solid rock under center of a cairn 7 feet in diameter at base and 10 feet high.

[Latitude 43° 37' 28.60". Longitude 117° 34' 45.93%.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	
Hunter.....	100	05	25.86	279	52	26.70	4.4097843
Westfall.....	138	06	12.34	317	49	59.51	4.6717166
Dry Creek.....	173	39	24.59	353	35	54.59	4.7846403
Vale.....	218	04	25.19	38	20	03.18	4.6900926
Mitchell.....	242	58	45.11	63	15	15.55	4.5562198
Owyhee.....	289	19	22.27	109	32	53.73	4.4472156

#### HUNTER, MALHEUR COUNTY.

On the highest of several bald buttes near the head of Hunters Creek. To reach it, go from William Jones's ranch on the Malheur River, 12 miles below Juntura, to ranch on Hunters Creek (good trail) known as the "horse pasture;" thence about 2 miles up creek to its head, and signal can be seen one-half mile farther up.

Station mark: A bronze triangulation tablet cemented in rock, over which a cairn 7 feet in diameter and 11 feet high was erected.

[Latitude 43° 39' 52.90". Longitude 117° 53' 34.86'.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Crow.....	72 45 41.32	252 20 17.40	4.7157176
Malheur.....	128 19 20.26	307 57 33.11	4.7296034
Castle Rock.....	149 33 43.89	329 21 37.82	4.6635390
Westfall.....	168 31 11.86	348 28 00.07	4.4920334
Vale.....	238 14 42.47	58 43 22.42	4.8137318
Grass.....	279 52 26.70	100 05 25.86	4.4097843
Dry Creek.....	198 06 55.00	18 16 27.97	4.7710334

IRONSIDE, MALHEUR COUNTY.

On the highest point of Ironside Mountain, a well-known mountain on the divide between Willow Creek and the Malheur River. It is near the head of Bridge Creek, a tributary of the Malheur. It can be reached from the head of Willow Creek or Bridge Creek. It is possible to take animals up from Willow Creek, but better to walk. There is a road up Willow Creek and a trail up Bridge Creek.

Station mark: A bronze triangulation tablet cemented in solid rock under a cairn 7 feet in diameter and 10 feet high.

[Latitude 44° 14' 36.27". Longitude 118° 08' 15.74'.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Castle Rock.....	8 36 40.14	188 34 43.63	4.3960190
Malheur.....	35 48 29.41	215 36 48.44	4.5841093
Strawberry.....	99 36 26.77	279 12 09.23	4.6714342
Dry Creek.....	282 04 57.48	102 24 47.63	4.5886244
Westfall.....	338 18 42.94	158 25 43.07	4.5615800

MITCHELL, MALHEUR COUNTY.

On Mitchell Butte just north of Owyhee River.  
 Station mark: A large cairn.

[Latitude  $43^{\circ} 46' 15.95''$ ;  $43^{\circ} 46' 12.59''$ .<sup>a</sup> Longitude  $117^{\circ} 10' 52.29''$ ;  $117^{\circ} 10' 52.19''$ .<sup>a</sup>]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Owyhee .....	12 41 11.19	192 38 14.06	4. 4188203
Grass .....	63 15 15.55	242 58 45.11	4. 5562198
Westfall .....	106 37 19.02	286 04 31.58	4. 8201630
Vale .....	175 30 12.32	355 29 17.99	4. 3481002
Weiser .....	202 04 21.40	22 16 00.86	4. 7739090

<sup>a</sup> Bull 122, p. 320. From Boise, Idaho, base and astronomic position.

#### OWYHEE, MALHEUR COUNTY.

On east side of the Owyhee River, on highest point of ridge known as the Owyhee Ridge. It is about 3 or 4 miles, air line, a little south of east from Hot Springs, at the mouth of Dry Creek. From Hot Springs go about  $1\frac{1}{2}$  miles down the river; thence up trail to ridge; thence to highest point in sight. There is good traveling from Wilson's ranch at Mitchell up ridge on east side of river.

Station mark: A bronze triangulation tablet cemented in solid rock under center of a cairn 7 feet in diameter at base and 10 feet high. There is another cairn on high point about 1 mile southeast from station.

[Latitude  $43^{\circ} 32' 26.67''$ . Longitude  $117^{\circ} 15' 08.88''$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Grass .....	109 32 53.73	289 19 22.27	4. 4472156
Vale .....	184 44 56.03	4 46 59.23	4. 6810602
Mitchell .....	192 38 14.06	12 41 11.19	4. 4188208

#### VALE, MALHEUR COUNTY.

Station is on a rocky hill about 2 miles a little south of east from Vale, and is on the east side of Malheur River. The hill is the highest point near Vale, but low when compared with other mountains 10 to 20 miles distant, and rather steep, but can be ascended from almost any direction on horseback.

Station mark: A bronze triangulation tablet cemented in solid rock under center of a cairn 8 feet in diameter at base and 10 feet high.

[Latitude 43° 58' 15.92". Longitude 117° 12' 10.69".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Mitchell.....	355 29 17.99	175 30 12.32	4. 3481002
Owyhee.....	4 46 59.23	184 44 56.03	4. 6810602
Grass.....	38 20 03.18	218 04 25.19	4. 6905926
Hunter.....	58 43 22.42	238 14 42.43	4. 8137318
Westfall.....	86 54 18.18	266 22 21.58	4. 7901006
Dry Creek.....	120 59 58.66	300 40 45.38	4. 6332245
Weiser.....	216 13 44.33	36 26 19.67	4. 6098122

## WESTFALL, MALHEUR COUNTY.

Station is on highest of three prominent buttes known as "the Westfall Buttes." Point used is the most western of the three buttes, and is 10 or 12 miles from the town of Westfall and about the same distance from Beulah post-office. It is on the main divide between Bully Creek and Malheur River and at the head of Cottonwood Creek; also near the head of Warm Creek. It can be easily reached on horseback from any direction.

Station mark: A bronze triangulation tablet cemented in rock under center of a cairn 8 feet in diameter at base and 10 feet high.

[Latitude 43° 56' 18.76". Longitude 117° 58' 11.95".]

To station—	Azimuth.	Back azimuth,	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Crow.....	43 25 18.23	223 03 02.02	4. 8003972
Malheur.....	94 28 11.56	274 09 33.44	4. 5566126
Castle Rock.....	118 24 02.47	298 15 06.99	4. 2905738
Ironside.....	158 25 43.07	338 18 42.94	4. 5615800
Dry Creek.....	223 38 54.85	43 51 41.90	4. 5503162
Vale.....	266 22 21.58	86 54 18.18	4. 7901006
Mitchell.....	286 04 31.58	106 37 19.02	4. 8201630
Grass.....	317 49 59.51	138 06 12.34	4. 6717166
Hunter.....	348 28 00.07	168 31 11.86	4. 4920698

## IDAHO.

## TRIANGULATION STATION.

Washington County.

WEISER, WASHINGTON COUNTY.

(Not occupied.)

On Sage Brush Hill, 6 miles northeast of the city of Weiser.

[Latitude 44° 15' 58.73". Longitude 116° 54' 05.66%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Mitchell.....	22 16 00.86	202 04 21.40	4.7739090
Vale.....	36 26 19.67	216 13 44.33	4.6098122
Dry Creek.....	80 14 00.95	259 42 07.91	4.7912617

## TEXAS.

## TRIANGULATION STATIONS.

Brewster and Presidio counties; Chisos, San Jacinto, Santiago, and Terlingua quadrangles.

Mr. Arthur Stiles, topographer, controlled portions of four 30-minute quadrangles in western Texas in July, August, and September, 1902, and in June, 1903.

This work is based upon stations Chisos and Santiago, previously developed from the Sierra Blanca base and astronomic station. Eight stations were occupied and numerous points located by intersections.

BIG CHRISTMAS, BREWSTER COUNTY.

(Not occupied.)

The highest peak in the Christmas Mountains, about 20 miles northeast of Terlingua.

Station mark: A large pile of loose stones and brush on the highest part of the peak.

[Latitude 29° 25' 38.73". Longitude 103° 26' 33.31%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Sue Peak.....			4.6518188
Chisos.....			4.3786355

BOQUILLAS, BREWSTER COUNTY.

(Not occupied.)

A windmill belonging to Mr. M. A. Ernst, about 500 feet west of the post-office, on the north side of the Neville Springs road.

Station mark: Center of tower.

[Latitude 29° 14' 56.80". Longitude 103° 01' 53.52".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Sue Peak .....			4. 2920238
Chisos.....			4. 4256435

CANYON FLAG, BREWSTER COUNTY.

About 8 miles south of Terlingua post-office, and 7 miles east of the United States custom-house at Lajitas. On the highest point of the Mesa de Anguila, overlooking the Grand Canyon of the Rio Grande. A trail from Lajitas leads up a big arroya to the Tinaja Lujan, which is about 1 mile north of the station. From this tinaja pack animals can be taken to station. Nearest semipermanent water is in Tinaja Lujan. There is a large ironwood bush on the mesa about 500 feet south of the station.

Station mark: A bronze triangulation tablet cemented in the solid rock, over which is a small conical pile of stones.

[Latitude 29° 12' 37.50". Longitude 103° 41' 19.25".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Fresno .....			4. 4469426
Three caves.....			4. 0768005
Hen Egg .....			4. 4859880
Chisos.....			4. 5733764

CHISOS, BREWSTER COUNTY.

The highest peak in the Chisos Mountains, about 90 miles south of Marathon and 30 miles east of Terlingua. It is most easily reached from the west side of the range by following a log road and trail leading up Blue Creek into the "basin," thence north and west over a very dim trail that leads up the long sloping ridge which runs out to the northeast from the peak. Nearest water is in the "basin," about 1,000 feet below the station on the southeast side. Pack animals can be taken to within 100 feet of station.

Station mark: A bronze triangulation tablet cemented in the solid rock under center of a cairn 8 feet high.

Reference mark: A cross mark and the letters U. S. cut deep in the rock. True azimuth,  $145^{\circ} 30'$ ; distance, 8.6 feet from station mark to center of cross.

[Latitude  $29^{\circ} 14' 43.36''$ . Longitude  $103^{\circ} 18' 20.23''$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	o ' "	o ' "	<i>Meters.</i>
Canyon flag.....			4. 5733764
Fresno .....			4. 7438314
Hen Egg .....			4. 5744834
San Jacinto.....			4. 9268718
Santiago.....			4. 8207929
Sue Peak .....			4. 5687809

#### CROTON PEAK, BREWSTER COUNTY.

(Not occupied.)

About 25 miles northwest of Boquillas post-office, north of the Terlingua and Boquillas wagon road, and about 3 miles west of Paint Gap.

Station mark: A bronze triangulation tablet cemented in the top of the highest boulder on the mountain.

[Latitude  $29^{\circ} 22' 18.24''$ . Longitude  $103^{\circ} 20' 54.40''$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	o ' "	o ' "	<i>Meters.</i>
Sue Peak .....			4. 5577963
Chisos.....			4. 1646320

#### HEN EGG MOUNTAIN, BREWSTER COUNTY.

About 75 miles south of Alpine, 20 miles northeast of Terlingua, and about 4 miles west of Adobe Walls. Nearest permanent water is in Terlingua Creek, 3 miles west. The mountain is a high, bare, lone peak. There are no trails, and pack animals can not be taken up at any point. A dim wagon road leads up the first big arroya on the east side, and about 2 miles distant from the peak. This mountain is sometimes called the "G 4 Mountain."

Station mark: A bronze triangulation tablet cemented in the solid rock under center of a cairn 8 feet high.

[Latitude 29° 28' 23.72". Longitude 103° 35' 29.87".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Canyon flag.....			4. 4859880
Three caves.....			4. 3295298
Fresno.....			4. 3878944
San Jacinto.....			4. 6717707
Santiago.....			4. 6384671
Chisos.....			4. 5733764

## MAIL BOX TANK, BREWSTER COUNTY.

(Not occupied.)

About 20 miles north of Boquillas post-office and on the east side of the Marathon and Boquillas road.

Station mark: Center of water tank.

This is a mud tank made by damming up a small draw. The lake formed above this dam is usually of a uniform shape and size, and it is the center of the lake that was sighted. Lake is about 100 by 150 feet.

[Latitude 29° 28' 49.03". Longitude 103° 08' 02.32".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Sue Peak.....			4. 2128530
Chisos.....			4. 4901508

## MARISCAL MOUNTAIN, BREWSTER COUNTY.

(Not occupied.)

About 18 miles south of Boquillas post-office, and in the extreme south point of the "big bend" of the Rio Grande. The river cuts through the mountain. Station is on highest part of the ridge.

Station mark: A bronze triangulation tablet cemented in the solid rock under center of a cairn 8 feet high.

[Latitude 29° 00' 54.71". Longitude 103° 08' 51.42".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Chisos.....			4. 4740387
Sue Peak.....			4. 6787910



## MAVERICK MOUNTAIN, BREWSTER COUNTY.

(Not occupied.)

About 12 miles east of Terlingua post-office and about 1 mile southwest of Maverick Spring. Highest point of mountain, Terlingua and Boquillas road passes near on north side. A trail leads up from the Study mines on the west side.

Station mark: Center of a cairn 6 feet high.

[Latitude  $29^{\circ} 19' 03.75''$ . Longitude  $103^{\circ} 30' 44.59''$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	o ' "	o ' "	<i>Meters.</i>
Three caves.....	.....	.....	4. 2991046
Hen Egg.....	.....	.....	4. 2759721

## NORTH CHRISTMAS, BREWSTER COUNTY.

(Not occupied.)

A big, high peak in the north edge of the Christmas Mountains.

Station mark: A bronze triangulation tablet cemented in the highest point of the peak.

[Latitude  $29^{\circ} 27' 12.51''$ . Longitude  $103^{\circ} 37' 35.23''$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	o ' "	o ' "	<i>Meters.</i>
Sue Peak.....	.....	.....	4. 6689303
Chisos.....	.....	.....	4. 4392551

## ROSILLOS MOUNTAINS, BREWSTER COUNTY.

(Not occupied.)

About 70 miles south of Marathon and 20 miles north of Boquillas post-office. About 4 miles west of the Marathon and Boquillas road, on highest peak in the range.

Station mark: A bronze triangulation tablet cemented in solid rock under center of a cairn 8 feet high.

[Latitude  $29^{\circ} 31' 50.17''$ . Longitude  $103^{\circ} 14' 33.55''$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	o ' "	o ' "	<i>Meters.</i>
Chisos.....	.....	.....	4. 5078397
Sue Peak.....	.....	.....	4. 4507407

## SANTIAGO, BREWSTER COUNTY.

On highest point of Santiago Mountain, about 18 miles a little north of east from Collins's ranch.

Station mark: A cross mark on a small stone post set in the earth under center of a cairn 10 feet high.

Reference marks: A bronze triangulation tablet cemented in the solid rock under the cairn and bearing from station mark N.  $30^{\circ}$  W.; distance, 1.6 feet. A cross mark and the letters U. S. cut deep in the rock and bearing from station mark S.  $22^{\circ} 59'$  W.; distance, 15.3 feet.

[Latitude  $29^{\circ} 50' 04.66''$ . Longitude  $103^{\circ} 24' 59.26''$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	o ' "	o ' "	<i>Meters.</i>
Hen Egg .....			4. 6384671
Fresno .....			4. 7847269
San Jacinto.....	80 20 25. 89	260 04 22. 01	4. 7232080
Sue Peak .....			4. 7952361
Chisos.....			4. 8207929

## SAWMILL MOUNTAIN, BREWSTER COUNTY.

(Not occupied.)

About 12 miles northeast of Terlingua post-office and 2 miles southwest of Doc Gourley's ranch. The Terlingua and Alpine road leads around the mountain on the east side. There is no trail to the summit, but the mountain is easily climbed from the northwest side.

Station mark: Center of a cairn 6 feet high.

Reference mark: A bronze triangulation tablet cemented in solid rock. True azimuth,  $58^{\circ} 30'$ ; distance, 18 feet.

[Latitude  $29^{\circ} 22' 00.05''$ . Longitude  $103^{\circ} 37' 19.12''$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	o ' "	o ' "	<i>Meters.</i>
Hen Egg .....			4. 0854364
Three caves .....			4. 0367221

## SIERRA CASTELLAN, BREWSTER COUNTY.

(Not occupied.)

A high red peak overlooking the valley of the Rio Grande, about 20 miles southeast of Terlingua, and about 7 miles east of the mouth

of the Grand Canyon of the Rio Grande. A plain wagon road from Terlingua de Abaja leads around the north side of the peak. Peak can be climbed from the east side only.

Station mark: Center of a cairn 7 feet high.

[Latitude 29° 08' 37.89". Longitude 103° 29' 51.89".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Hen Egg .....			4. 5755520
Canyon flag.....			4. 3006878
Fresno .....			4. 6583082

#### STUARTS PEAK, BREWSTER COUNTY.

(Not occupied.)

A sharp peak on the highest part of long ridge, about 20 miles north of Boquillas post-office and about 8 miles due east of the "Mail Box tank."

Station mark: A cairn about 6 feet high.

[Latitude 29° 29' 39.19". Longitude 103° 01' 12.63".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Sue Peak .....			3. 5579811
Chisos .....			4. 5921700

#### SUE PEAK, BREWSTER COUNTY.

About 75 miles south of Marathon and 15 miles northeast of Boquillas post-office. About 10 miles from the Marathon and Boquillas wagon road, southeast from the "Mail Box tank." A very dim wagon road leads from the tank eastward to within about 3 miles of the peaks. The station is on the easternmost and highest of the two peaks. Nearest permanent water is in the Mail Box water tank.

Station mark: A bronze triangulation tablet cemented in the solid rock under the center of a cairn 9 feet high.

Reference mark: A cross mark and the letters U. S. cut deep in the rock. Azimuth from station mark is 103° 42'; distance, 15.6 feet to center of cross.

[Latitude 29° 25' 12.29". Longitude 102° 58' 49.47".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	o ' "	o ' "	<i>Meters.</i>
Chisos.....			4. 5687809
Hen Egg.....			4. 7752113
Santiago.....			4. 7952361

## THREE CAVES, BREWSTER COUNTY.

One mile west of Terlingua post-office, on the highest part of limestone ridge, immediately above the three caves. A good trail leads from the post-office to the station, and saddle animals can be taken to station.

Station mark: A bronze triangulation tablet cemented in solid rock under center of a cairn 8 feet high.

[Latitude 29° 18' 54.42". Longitude 103° 43' 02.41".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	o ' "	o ' "	<i>Meters.</i>
Fresno.....			4. 2304563
Hen Egg.....			4. 3295288

## WEST CORAZONES, BREWSTER COUNTY.

(Not occupied.)

The highest and sharpest of the Corazones peaks, about 25 miles northeast of Terlingua post-office.

Station mark: A bronze triangulation tablet cemented in the rock on the highest part of the peak.

[Latitude 29° 29' 28.09". Longitude 103° 25' 44.60".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	o ' "	o ' "	<i>Meters.</i>
Sue Peak.....			4. 6457200
Chisos.....			4. 4735843

## WILLOW MOUNTAIN, BREWSTER COUNTY.

(Not occupied.)

About 15 miles east of Terlingua post-office, just above Willow Spring and George Cartwright's ranch.

Station mark: Center of highest boulder on mountain.

[Latitude 29° 21' 52.02". Longitude 103° 30' 58.35".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	o ' "	o ' "	<i>Meters.</i>
Hen Egg .....			4. 1494596
Three caves .....			4. 3071437
Fresno .....			4. 5045176

BASSETT BUTTE, PRESIDIO COUNTY.

(Not occupied.)

A lone, smooth knob about 10 miles east of Pulvo, 7 miles west of George Howard's ranch, and 3½ miles southwest of Sancita Spring. An old trail leads from Sancita Spring around the east foot of the knob. Peak commands good view of country around.

Station mark: Small pile of stones on highest part of peak.

[Latitude 29° 26' 56.05". Longitude 104° 01' 02.18".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	o ' "	o ' "	<i>Meters.</i>
Fresno .....			4. 2455097
San Jacinto .....			4. 5351691
Hen Egg .....			4. 6167310

FRESNO, PRESIDIO COUNTY.

About 70 miles south of Marfa, about 20 miles northeast of Terlingua, about 1½ miles east of the main Marfa and Terlingua road, and about 1,500 feet above it. It overlooks the canyon of Fresno Creek. It is the highest peak on the western rim of a region known as the "Solitario." Most easily reached from McGuirk's tanks in the "Solitario," from which a trail leads to the east bottom of the peak. Pack animals can be led up to the station from the east side only. Nearest permanent water is in the tanks, or at Rawl's ranch. A dim wagon road leads from the tanks to the ranch.

Station mark: A bronze triangulation tablet cemented in the solid rock under center of a cairn 8 feet high.

[Latitude 29° 25' 35.41". Longitude 103° 50' 15.75".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
San Jacinto .....			4. 5797046
Santiago .....			4. 7847269
Hen Egg .....			4. 3878944
Chisos .....			4. 7438314
Three caves .....			4. 2304563
Canyon flag .....			4. 4469426

## UTAH.

## SECONDARY TRIANGULATION STATIONS.

Salt Lake, Summit, and Wasatch counties; Cottonwood special quadrangle.

Secondary triangulation for the control of the Cottonwood special quadrangle was extended from stations Bald, Clayton, and Saddle in June, 1903, by Mr. R. H. Sargent, topographer. Eight stations were occupied and numerous points were cut in. Positions are given on the United States standard datum.

## BRIGHTON, SALT LAKE COUNTY.

A secondary station on limestone bluff on divide 1,500 feet north of Brighton and Alta trail.

Station mark: A bronze triangulation tablet cemented in a solid limestone rock.

[Latitude 40° 35' 55.43". Longitude 111° 36' 34.32".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Sugarloaf .....	18 55 10	198 54 36	3. 58188
Silver .....	193 00 16	13 00 54	3. 78710
Clayton .....	281 27 09	101 29 07	3. 63744

## SUGARLOAF, SALT LAKE COUNTY.

A secondary station on first point east of trail from Alta to American Fork.

Station mark: A bronze triangulation tablet cemented in solid rock.

Reference mark: A rock monument 5 feet high and 4 feet in diameter at base; distance from station mark, 8.33 feet; true azimuth, 66° 40'.

[Latitude 40° 33' 58.33". Longitude 111° 37' 26.98".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Silver .....	195 15 59	15 17 12	3. 99698
Brighton .....	198 54 36	18 55 10	3. 58188
Clayton .....	243 22 57	63 25 29	3. 78830
Bonanza .....	267 35 54	87 41 40	4. 09696

## ANCHOR, SUMMIT COUNTY.

A secondary station on ridge just west of Anchor mine and about three-fourths mile northwest of Chapman's Sawtooth triangulation station.

Station mark: A bronze triangulation tablet cemented in a rock 12 by 10 by 8 inches, set in ground.

[Latitude 40° 36' 44.48". Longitude 111° 31' 38.64".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Clayton .....	48 39 50	228 38 35	3. 55585
Saddle .....	232 28 35	52 30 47	3. 77897
Bald .....	274 57 38	94 59 29	3. 60493
Bonanza .....	317 01 05	137 03 04	3. 79949

## BALD, SUMMIT COUNTY.

A secondary station on a high rocky summit about one-half mile south of the Ontario mine.

Station mark: A bronze triangulation tablet cemented in rock in place.

[Latitude 40° 36' 33.16". Longitude 111° 28' 48.00".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Clayton .....	73 13 37	253 10 31	3. 84581
Anchor .....	94 59 29	274 57 38	3. 60493
Wanship .....	180 03 00	00 03 01	4. 43717
Saddle .....	190 43 02	10 43 23	3. 61070
Highway .....			3. 50672
Silver .....	116 40 04	296 35 39	4. 03002
Bonanza .....	356 12 20	176 12 28	3. 63062

SADDLE, SUMMIT COUNTY.

A secondary station on a high, bare hill 1 mile due east of Park City and one-eighth mile north of Heber and Park City wagon road where it crosses divide.

Station mark: A bronze triangulation tablet cemented in shattered rock in place.

[Latitude 40° 38' 43.14". Longitude 111° 28' 15.68".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Bald .....	10 43 23	190 43 02	3. 61070
Treasury Hill .....	69 04 11	249 02 43	3. 53084
Bluff .....	72 30 55	252 29 07	3. 61255

SAWTOOTH, SUMMIT COUNTY.

A secondary station on a rocky hill one-fourth mile south of the Daly West mine and one-fourth mile west of road crossing divide.

Station mark: A bronze tablet set in concrete, about 6 inches below surface of ground.

[Latitude 40° 36' 31.98". Longitude 111° 31' 01.34".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Clayton .....			3. 61210
Wanship .....			4. 44060

SILVER, ON LINE BETWEEN SUMMIT AND SALT LAKE COUNTIES.

A secondary station, located on the divide between the Big Cottonwood Creek and Iron Hollow drainages, 2½ miles north of the stage road from Park City to Silverlake.

Station mark: A triangulation tablet cemented in solid sandstone rock.



[Latitude 40° 39' 08.88". Longitude 111° 35' 35.64".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Brighton .....	13 00 54	193 00 16	3. 78710
Sugarloaf .....	15 17 12	195 15 59	3. 99698
Saddle .....			4. 01562
Clayton .....	337 10 45	157 12 05	3. 86981
Bald .....	295 35 39	116 40 04	4. 03002

## BONANZA, WASATCH COUNTY.

On the north end of the last knob of the spur running south from Bald Mount, 2 miles southeast of Bonanza Flat.

Station mark: A bronze triangulation tablet cemented in solid rock on north end of hill.

[Latitude 40° 34' 14.97". Longitude 111° 28' 35.98".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Clayton .....	107 45 07	287 41 54	3. 86602
Anchor .....	137 03 04	317 01 05	3. 79949
Bald .....	176 12 28	356 12 20	3. 63062
Sugarloaf .....	87 41 40	267 35 54	4. 09696

## WASHINGTON.

## TRIANGULATION STATIONS.

Adams, Douglas, Franklin, Kittitas, Okanogan, and Yakima counties.

During the field season of 1903 Mr. R. B. Robertson extended triangulation from stations Moses, Salt Lake, and Kellar, previously located from the Spokane base and astronomic station, southward and westward, connecting with stations Cooper, Chelan, Atanum, and Wenas, established from the Ellensburg base and astronomic station; the net results of this work being the locating and monumenting of sixty-two stations for the control of an area of 6,500 square miles in the central portion of the State. Positions are given on Spokane datum.

## CRAB, ADAMS COUNTY.

The highest point of the Saddle Mountain range east of the Ephrata and White Bluff road. Station is about 8 miles south of Sam Hutchinson's ranch on Crab Creek. Take road from Sam Hutchinson's

place to White Bluff, follow this road until summit of Saddle Mountain is reached, then go east along summit to highest point, which is about 10 miles north of White Bluff ferry. Water can be found in Crab Creek, 4 miles north.

Signal: A lumber tripod 10 feet high.

Station mark: A bronze triangulation tablet cemented in a stone placed in ground, level with surface.

[Latitude 46° 46' 27.99". Longitude 119° 19' 18.11'.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Saddle (2).....	99 17 12.86	279 01 52.50	4.4333970
Frenchman.....	132 33 44.15	312 20 36.00	4.4913920
McManamon.....	173 35 13.29	353 33 57.80	4.2920014
Jackson.....	218 11 56.36	38 20 59.03	4.4053183

SADDLE, ADAMS COUNTY.

Station is on the highest point of Saddle Mountain and is about 4 miles southwest of Ben Hutchinson's ranch on Crab Creek. Trails from Hutchinson's ranch to top of mountain. The nearest water is Crab Creek. Grass and hay at Ben Hutchinson's place.

Station mark: A bronze triangulation tablet cemented in solid rock under center of a cairn 8 feet high.

[Latitude 46° 48' 22.45". Longitude 119° 33' 33.43'.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Coal.....	48 46 15	228 31 59	4.52292
Saddle (2).....	95 13 15	275 08 14	3.93823
Frenchman.....	164 43 06	344 40 24	4.25600
McManamon.....	224 54 23	45 03 32	4.35260
Crab.....	280 56 24	101 06 47	4.26676
Kuntz.....	306 22 22	126 37 38	4.52155
Gable.....	342 45 28	162 49 32	4.38094

BADGER, DOUGLAS COUNTY.

On the summit of the highest part of the Badger Mountain that is bare of timber. The highest part lies some miles northwest and has some timber on the top. Badger Mountain forms a divide between Douglas Creek on the north and Rock Island Creek and Moses Coulee on the south. Station is about 6 miles a little north of west from Smith's ranch, where Douglas Creek joins Moses Coulee. Take wagon

road up Douglas Creek about 1 mile, then trail to left, and keep going up until station is reached. This station can probably be reached from any side.

Signal: A small pine tree set in ground and braced with four poles.

Station mark: A bronze triangulation tablet cemented in stone and placed in ground, with top a few inches above surface.

[Latitude 47° 28' 24.48". Longitude 119° 58' 51.97".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Chelan .....	173 44 09.91	353 41 45.54	4.5713228
Guske .....	233 22 53.35	53 34 21.36	4.3850879
Three Springs.....	274 20 42.34	94 39 29.94	4.5071933
Baird .....	321 35 25.76	141 43 19.37	4.3374576
Hill .....	358 21 55.52	178 22 27.88	4.5115055

#### BAIRD, DOUGLAS COUNTY.

On the summit of the highest peak of range of mountains lying north of Quincy and Winchester, and about 6 miles north-northeast of the former and the same distance northwest of the latter. There is a road from Quincy to Baird Springs, which crosses the mountains to the west of station, and not over 2 miles from it. There is a road from Winchester to a spring well, in a ravine, about 1 mile southwest of station. From this well a wagon can be taken to summit of peak by following spur on east side of ravine. Station is easily reached from any side.

Station mark: A bronze triangulation tablet set in a stone and placed in ground, level with surface, under center of a cairn 7 feet high.

[Latitude 47° 19' 12.13". Longitude 119° 48' 08.53".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Columbia.....	12 38 06.10	192 33 22.53	4.5724445
Hill.....	39 21 44.55	219 14 24.38	4.2988781
Badger .....	141 43 19.36	321 35 25.76	4.3374576
Guske .....	190 51 09.80	10 54 42.86	4.5062376
Three Springs.....	231 54 24.77	52 05 17.45	4.3730495
Two Springs .....	279 33 25.97	99 40 05.38	4.0635487
Blythe .....	292 12 12.60	112 23 46.96	4.3317557
Frenchman.....	340 54 07.46	161 02 04.21	4.6235149
McMain .....	0 52 22.23	180 52 12.45	4.2653792

BLACK BUTTE, DOUGLAS COUNTY.

(Not occupied.)

A prominent butte about 5 miles west of Leahy post-office. Always looks blacker than the rest of the country.

Station mark: The sharp summit of the butte.

[Latitude 47° 55' 00.6." Longitude 119° 31' 20.1".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Dewey .....	45 08 12.8	224 56 20	4.45125
Chelan .....	72 29 42.0	252 06 52	4.60556

BLUFF, DOUGLAS COUNTY.

About 6 miles southeast of Ephrata and 2 miles about northeast of Blythe's upper ranch on Crab Creek. The country is very flat around station and there is very little difference in elevations. The best road to take is from T. S. Blythe's ranch on Crab Creek, 8 miles from Ephrata. Take road from ranch across Crab Creek; after road crosses creek it goes up the bluff to a rocky flat. Just on top of bluff leave road and go east-northeast a short distance, when a black rocky bluff will appear in view. This bluff is steep in the middle and slopes off gradually at north and south ends. Climb bluff at north end and go east about 400 yards to a slight but decided rise on the flat, where the ground is sandy and nearly free from rock. Station is on this rise.

Signal: A lumber tripod 8 feet high, with flag pole.

Station mark: A stone marked with a shallow drill hole with a triangle around it and a poorly carved U. S.—thus: U Δ S.

[Latitude 47° 16' 28.6". Longitude 119° 25' 10.07".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Blythe .....	71 14 52	251 09 35	3.98273
Three Springs.....	152 18 23	332 12 22	4.34494

BLYTHE, DOUGLAS COUNTY.

About 5 miles south of Ephrata and on the highest point in the vicinity, take road from Ephrata to Blythe's ranch, on Crab Creek, and follow it one-half mile, then take right-hand road on top of hill overlooking town, follow this right-hand road about 2½ miles, then go across country 2 miles to a gradually sloping low, round hill, on which station is located.

Signal: A lumber tripod 14 feet high with targets on top.

Station mark: A bronze triangulation tablet cemented in stone and placed in ground with top 6 inches above surface.

[Latitude 47° 14' 48.37". Longitude 119° 32' 23.47".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Frenchman.....	11 09 38.62	191 06 02.73	4. 5077012
Columbia.....	44 53 19.08	224 37 03.15	4. 6007210
Hill.....	77 34 28.41	257 15 34.91	4. 5224508
Baird.....	112 23 46.93	292 12 12.60	4. 3317557
Two Springs.....	126 23 14.56	306 18 19.50	4. 0204556
Three Springs.....	176 55 26.91	356 54 44.15	4. 3562817
Severson.....	226 08 06.12	46 23 19.04	4. 5568617
Lewis.....	292 50 15.48	112 58 11.70	4. 1708355

#### COLUMBIA, DOUGLAS COUNTY.

On the highest point on the west end of Frenchman Mountain, where it breaks off to the Columbia River. It is about 18 miles from Quincy and is nearly due south of that place; there is a road to base of hill on which station is located, and there will be a road crossing the hill soon. This will be the road from Quincy to Cregg's ferry, at the mouth of Crab Creek, and it will cross Frenchman Mountain about one-half mile east of station. Water is in Columbia River 3 miles west, and there is said to be water in breaks northwest of station.

Signal: A lumber tripod 14 feet high.

Station mark: A bronze triangulation tablet buried 2 feet underground, over which is placed a stone, resting on tablet, with the top level with surface of ground; this stone, a very hard one, marked with a  $\frac{3}{4}$ -inch drill hole, one-half inch deep, centered over tablet, which is centered under signal.

[Latitude 46° 59' 31.35". Longitude 119° 54' 35.30".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Johnson.....	55 09 26.83	234 57 20.01	4. 4096007
Hill.....	167 59 57.52	347 57 21.76	4. 3331720
Baird.....	192 33 22.53	12 38 06.10	4. 5724445
McMann.....	203 33 12.69	23 37 46.14	4. 2941981
Blythe.....	224 37 03.15	44 53 19.08	4. 6007210
Frenchman.....	278 21 53.23	98 34 31.47	4. 3456293
Saddle (2).....	317 36 34.61	137 36 34.61	4. 4292627
Sentinel.....	349 35 54.22	169 37 56.52	4. 2936977

## COULEE, DOUGLAS COUNTY.

On a round hill on top of the east bluff of Moses Coulee, about 9 miles northwest of Quincy and 3 miles northwest of Willow Springs. Take road from Quincy to Moses Coulee by Willow Springs; 2 miles northwest of Springs take right-hand road about 1 mile to top of ridge. Station is 0.25 mile west of here and is in sight from road.

Station mark: A bronze triangulation tablet in solid rock 8 inches underground, over which is placed a stone marked U. S., with a drill hole one-half inch deep under center of a cairn 7 feet high.

[Latitude  $47^{\circ} 19' 30.31''$ . Longitude  $119^{\circ} 59' 54.85''$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Badger .....	184 33 51	4 34 37	4. 21880
Baird .....	272 05 41	92 14 20	4. 17153
Hill .....	351 58 22	171 59 41	4. 20733

## COULEE CITY, DOUGLAS COUNTY.

(Not occupied.)

Two-story yellow schoolhouse.

Station mark: Center of cupola.

[Latitude  $47^{\circ} 19' 30.30''$ . Longitude  $119^{\circ} 59' 54.86''$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Badger .....	184 33 51	4 34 37	4. 21880
Baird .....	272 05 41	92 14 20	4. 17153

## DEWEY, DOUGLAS COUNTY.

On a little sharp peak about 3 miles northeast of Dewey schoolhouse and 2 miles east of Carl Schmidt's farm. Station is about 10 miles southwest of Buckingham post-office. Take road from Schmidt's northeast about a mile, to top of hill, then go east along ridge to station. This is the Buckingham and Waterville road and it passes about 1 mile west of station.

Station mark: A bronze triangulation tablet cemented in a stone, which was placed in ground level with surface under center of a cairn 7 feet high.

[Latitude 47° 44' 13.84". Longitude 119° 47' 21.73".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Chelan .....	112 49 00.15	292 38 04.30	4.3008639
Cooper .....	144 00 48.68	323 47 37.27	4.5756229
Dyer .....	182 23 34.86	2 24 16.13	4.4415349
Ragged .....	225 55 34.82	46 13 25.91	4.6198824
St. Andrews .....	268 25 52.73	88 37 07.45	4.2787582
Guske .....	341 12 03.86	161 15 03.04	4.1961927

## DYER, DOUGLAS COUNTY.

On the highest point of a rocky butte lying one-half mile north-northwest from Dyer post-office. Land belongs to Mrs. Priest, Dyer postmaster.

Station mark: A bronze triangulation tablet cemented in solid rock under center of a cairn 7 feet high.

[Latitude 47° 59' 07.97". Longitude 119° 46' 26.08".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Dewey .....	2 24 16.13	182 23 34.86	4.4415349
Chelan .....	44 36 12.71	224 24 34.33	4.4454873
Cooper .....	96 58 04.26	276 44 09.94	4.3699991
Salt Lake .....	210 41 56.32	30 51 27.60	4.4917360
Ragged .....	267 16 48.54	87 34 00.36	4.4596984
St. Andrew .....	326 39 05.15	146 49 39.93	4.5110898

## FLYNN, DOUGLAS COUNTY.

In a plowed field controlled by Andy Flynn, about 1 mile east and 4 miles north of Hartline. From Hartline take lane north one-half mile, east 1 mile, north about 3 or 3½ miles until top of hill is reached; from here station is 75 yards east.

Signal: A lumber tripod 14 feet high over station mark.

Station mark: A bronze triangulation tablet cemented in rock and placed in ground, level with surface.

Reference mark: A bronze triangulation tablet cemented in rock and placed in ground, under east fence of lane, 298.5 feet from station mark, on line to Pilot Rock. Station mark and reference mark are alike. The latter is below top of hill and view to east is cut off.

[Latitude 47° 45' 07.15". Longitude 119° 05' 02.17".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Severson .....	15 01 03.78	194 56 08.15	4. 5098451
McDonald .....	57 00 25.27	236 44 02.78	4. 5199072
Pilot .....	70 05 34.67	249 54 34.04	4. 2967367
Stevenson .....	171 56 27.46	351 53 57.42	4. 4755802

## FRENCHMAN, DOUGLAS COUNTY.

Frenchman Mountain is a long ridge running east and west from Crab Creek at McManamon's ranch to the Columbia River, forming a divide between Crab Creek and the flats and sand hills lying south of Quincy and Ephrata. There are several points along this ridge which are higher than the rest of it, on three of which are triangulation stations, viz: McManamon, at extreme east end; Columbia, near the west end; and Frenchman, about halfway between the two. There is a wagon road from McManamon's to the Columbia River, which leaves station about 1 mile to the west or north according to where the road is left. It is best to leave the road where it starts down on south edge of ridge. From this place station is on highest point a mile east. There is a road part of the way from Winchester, but the rest of the way is in sand hills, which make slow traveling, although there is nothing to stop a vehicle anywhere; nearest water, Crab Creek.

Signal: A tripod 14 feet high with targets.

Station mark: A bronze triangulation tablet centered under signal, cemented in stone.

[Latitude 46° 57' 45.64". Longitude 119° 37' 18.16".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Saddle (2) .....	13 07 43.69	193 05 30.31	4. 2317882
Sentinel .....	48 57 26.19	228 46 51.30	4. 3881650
Columbia .....	98 34 31.47	278 21 53.23	4. 3456293
Hill .....	132 49 17.03	312 34 01.90	4. 5548277
McMain .....	146 44 50.81	326 36 44.96	4. 4065124
Baird .....	161 02 04.21	340 54 07.46	4. 6235149
Blythe .....	191 06 02.73	11 09 38.62	4. 5077012
Lewis .....	217 32 14.88	37 43 45.81	4. 5131908
McManamon .....	273 56 46.92	94 08 40.62	4. 3159944
Crab .....	312 20 36.00	132 33 44.15	4. 4913920



## GREEN, DOUGLAS COUNTY.

Station is about 10 miles southwest of Ephrata, on one of the highest points, where country breaks toward Moses Lake. It is a small hill composed of very fine black gravel and is difficult to describe. It will best be found by taking a course from other stations.

Signal: A lumber tripod 12 feet high.

Station mark: A bronze triangulation tablet cemented in rock and placed in ground, level with surface, under center of signal.

[Latitude  $47^{\circ} 11' 09.87''$ . Longitude  $119^{\circ} 29' 29.18''$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Frenchman .....	21 46 16	201 40 32	4. 42705
Lewis .....	264 20 56	84 26 01	4. 00163
McManamon .....	337 47 08	157 53 19	4. 45321

## GUSKE, DOUGLAS COUNTY.

On nearly the highest point of a ridge running above the north or west side of Moses Coulee. It is the highest point in the vicinity. Station is about 25 miles from Coulee City on the Waterville road and 5 miles east of Farmer post-office on the same road, and one-half mile south of where the road crosses the ridge. Land is owned or leased by August Guske, who lives 300 yards west of station.

Signal: A lumber tripod 14 feet high, with two black and white targets in top, centered over mark.

Station mark: A bronze triangulation tablet cemented in stone and placed in ground, level with surface.

[Latitude  $47^{\circ} 36' 12.21''$ . Longitude  $119^{\circ} 43' 19.36''$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Baird .....	10 54 42.86	190 51 09.80	4. 5062376
Badger .....	53 34 21.36	233 22 53.35	4. 3850879
Chelan .....	133 58 28.50	313 44 34.10	4. 5134122
Dewey .....	161 15 03.04	341 12 03.86	4. 1961927
St. Andrew .....	222 11 42.06	42 19 56.88	4. 3172329
McDonald .....	274 20 41.93	94 32 36.88	4. 3072474
Three Springs .....	323 33 12.08	143 40 32.95	4. 3238180

HILL, DOUGLAS COUNT

Station is said to be in southeast quarter of sec. 32, T. 19, R. 23, homesteaded by John Hill, and lying 3 miles south and 4 miles west of Quincy. It is about the highest point of ridge and is 8 feet south of fence dividing lands of John Hill and Mr. Coburn. The ground in Coburn's plowed field may be a little higher.

Signal: A lumber tripod 14 feet high with targets on top.

Station mark: A granite boulder marked U. Δ S., with a drill hole one-half inch deep marking center, placed in ground, level with surface. Signal centered over mark.

[Latitude 47° 10' 53.45". Longitude 119° 58' 07.97%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Badger .....	178 22 27.88	358 21 55.52	4.5115055
Baird .....	219 14 24.38	39 21 44.56	4.2988781
Blythe .....	257 15 34.91	77 34 28.41	4.5224508
Frenchman .....	312 34 01.90	132 49 17.03	4.5548277
Columbia .....	347 57 21.76	167 59 57.52	4.3331720

HILL HOUSE, DOUGLAS COUNTY.

(Not occupied.)

A small unpainted house on top of hill about 4 miles northeast of Adrian and 1½ miles east of where the Coulee City "cut-off" railroad joins the Great Northern main line. This is on the west or lower end of ridge which runs from near Adrian to Wilson Creek. Lamp triangulation station is on the east end of this ridge.

Station mark: Center of house.

[Latitude 42° 24' 26.20". Longitude 119° 20' 33.02%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Bluff .....	21 35 54	201 32 30	4.20027
Three Springs .....	106 47 18	286 37 52	4.22582

JACKSON, DOUGLAS COUNTY.

On the highest part of a flat ridge about 8 miles south of Wheeler post-office and 6 miles west of Petersburg post-office. Station is on S. C. Hanson's land and is 0.5 mile west of Oliver Jackson's house.

Signal: A lumber tripod 14 feet high with targets on top.

Station mark: A bronze triangulation tablet cemented in a stone and placed in ground, level with surface, under center of signal.

[Latitude 46° 57' 14.45". Longitude 119° 06' 54.46%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Crab .....	38 20 59.03	218 11 56.39	4.4053183
McManamon .....	88 29 46.89	268 19 27.84	4.2533409
Lewis .....	145 20 58.57	325 10 14.06	4.5130523
Wheeler.....	187 48 17.09	7 50 22.96	4.4256706

KEANE, DOUGLAS COUNTY.

(Not occupied.)

On a sharp, bare peak, being the most prominent point between Rock Island Creek and Columbia River, and about 4 miles from the mouth of Rock Island Creek. Rock Island post-office is about 4 miles south of station, and J. E. Keane's house is about 3 miles southwest. There is a good trail from Keane's to station. It is in sec. 7, T. 22, R. 22.

Signal: A small fir tree set in ground and braced with three poles.

Station mark: A bronze triangulation tablet set in stone and placed in ground, level with surface.

[Latitude 47° 24' 16.16". Longitude 120° 06' 43.08%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Badger .....	232 06 34	52 12 21	4.09692
Baird .....	291 45 35	111 59 15	4.40146

LEWIS, DOUGLAS COUNTY.

On seemingly the highest point of a sand flat about 15 miles south-east of Ephrata. The road from Ephrata to White Bluff ferry passes to the north and east of station, and this road is about 150 yards east at the nearest point. Station is in sight from Mr. Lewis's house and bears about N. 18° W. from there. Water is in Moses Lake, one-half mile south. Lewis ranch is about 5 miles from station.

Signal: A lumber tripod 14 feet high, with targets on top.

Station mark: A bronze triangulation tablet cemented in a lava stone and placed in ground, with top 3 inches above surface.

[Latitude 47° 11' 41.61". Longitude 119° 21' 34.65%.]

To station—	Azimuth.			Back azimuth.			Log. distance. <i>Meters.</i>
	°	'	"	°	'	"	
Frenchman .....	37	43	45.81	217	32	14.88	4.5131908
Blythe .....	112	58	11.70	292	50	15.48	4.1708355
Three Springs.....	152	30	45.60	332	22	05.83	4.5063587
Severson .....	201	59	44.73	22	07	00.20	4.5199865
Wheeler.....	270	52	17.91	91	05	09.77	4.3453875
Jackson .....	325	10	14.06	145	20	58.57	4.5130523
McManamon.....	358	31	51.65	178	32	15.87	4.4359217

## M'DONALD, DOUGLAS COUNTY.

On summit of ridge between Grand Coulee and Moses Coulee, on the highest point in this vicinity. It is in a field belonging to Mr. McDonald, of Coulee City, and is about 1 mile north-northeast of his ranch house. This ranch, at which there is a good place to camp, is 12 miles northwest of Coulee City and lies about 1½ miles south of Coulee City and Waterville road.

Signal: A tripod built of lumber 14 feet high, with two black and white targets on top.

Station mark: A bronze triangulation tablet cemented in lava rock and placed in ground, level with surface, under center of signal.

[Latitude 47° 35' 21.30". Longitude 119° 27' 11.13%.]

To station—	Azimuth.			Back azimuth.			Log. distance. <i>Meters.</i>
	°	'	"	°	'	"	
Three Springs.....	26	45	44.23	206	41	10.97	4.2364733
Guske .....	94	32	36.88	274	20	41.93	4.3072474
St. Andrew .....	159	48	51.97	339	45	11.00	4.2564234
Pilot Rock.....	218	45	20.08	38	50	42.29	4.1621557
Flynn .....	236	44	02.78	57	00	25.27	4.5199072
Stevenson .....	304	00	38.58	124	12	03.62	4.3703550

## M'MANAMON, DOUGLAS COUNTY.

On the east end of Frenchman Mountain, a long ridge extending east and west from the Columbia River to McManamon's ranch on Crab Creek. Road from Ephrata to White Bluff passes 1 mile east of station. Station is about 5 miles east and a little south of Thomas McManamon's ranch. To go from Crab Creek take road from McManamon's ranch.

mon's east until old crossroad (Winchester road) is reached, then take left-hand crossroad through two gates until top of ridge is reached, thence up ridge to station.

Signal: A lumber tripod 14 feet high with targets on top.

Station mark: A bronze triangulation tablet set in stone and placed in ground, level with surface, under center of signal.

[Latitude 46° 56' 58.35". Longitude 119° 21' 01.57%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Saddle (2) .....	58 26 20.98	238 14 14.82	4. 4600587
Frenchman .....	94 08 40.62	273 56 46.92	4. 3159944
Lewis .....	178 32 15.87	358 31 51.65	4. 4389217
Wheeler .....	218 32 00.89	38 44 26.99	4. 5369960
Jackson .....	268 19 27.84	88 29 46.89	4. 2533409
Crab .....	353 33 57.80	173 35 13.29	4. 2920014

#### M'CUNE, DOUGLAS COUNTY.

(Not occupied.)

A prominent butte about 2 miles west and 5 miles south of Buckingham post-office. Seemingly bowlders on top.

Station mark: The highest part of summit.

[Latitude 47° 48' 58". Longitude 119° 44' 13%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Dewey .....	24 07 55.8	204 05 36	3. 98303
St. Andrew .....	298 46 02.0	118 54 57	4. 23510

#### M'MANN, DOUGLAS COUNTY.

In the northwest corner of John McMann's field, about 75 yards west and a little north of his house. McMann's ranch is 6 miles south and 1 mile east of Quincy. A good well is at his place.

Signal: A lumber tripod 14 feet high with two white targets on top.

Station mark: A bronze triangulation tablet cemented in a block of gray granite and placed in ground, with top 2 inches above surface, under center of signal.

[Latitude 47° 09' 15.60". Longitude 119° 48' 21.85".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Columbia.....	23 37 46.14	203 33 12.69	4.2941981
Baird .....	180 52 12.45	0 52 22.23	4.2653792
Frenchman .....	326 36 44.96	146 44 50.81	4.4065124

PILOT, DOUGLAS COUNTY.

On the highest part of a solid rock 40 feet high, a well-known point one-half mile east of the road from Coulee City to Bridgeport and about 10 miles from Coulee City. A section line runs over the rock, and station is on Mr. Horning's side of the fence.

Signal: A lumber tripod 10 feet high, braced with rocks piled around each leg and centered over mark.

Station mark: A bronze triangulation tablet cemented in solid rock.

[Latitude 47° 41' 27.87". Longitude 119° 19' 55.07".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
McDonald.....	38 50 42.29	218 45 20.08	4.1621557
St. Andrew.....	110 12 17.04	290 03 13.28	4.2126215
Ragged.....	172 58 24.75	352 55 54.73	4.5352471
Stevenson.....	201 28 16.95	21 36 49.02	4.5921888
Flynn.....	249 54 34.04	70 05 34.67	4.2967367
Severson.....	337 08 15.94	157 14 19.61	4.4241162

QUINCY, DOUGLAS COUNTY.

(Not occupied.)

Station mark: Center of cupola on two-story white schoolhouse.

[Latitude 47° 13' 59.86". Longitude 119° 51' 18.96".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Hill.....	56 16 00	236 11 00	4.01692
Frenchman.....	329 24 02	149 34 18	4.54310

RAGGED, DOUGLAS COUNTY.

Station is on the top of a large boulder on the summit of Ragged Butte, 6 miles north of Leahy post-office. The butte is covered with

large boulders and looks ragged from a distance. There is a road from Leahy nearly all the way.

Station mark: A bronze triangulation tablet cemented in top of a boulder 15 feet high and under center of a cairn 5 feet high.

[Latitude  $47^{\circ} 59' 49.92''$ . Longitude  $119^{\circ} 23' 17.44''$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
St. Andrews .....	21 20 00.25	201 13 25.25	4.4843208
Dewey .....	46 13 25.91	225 55 34.82	4.6198824
Dyer .....	87 34 00.36	267 16 48.54	4.4596984
Salt Lake .....	153 11 41.97	333 03 59.54	4.4537844
Moses .....	210 03 48.55	30 18 21.95	4.6825417
Pilot .....	352 55 54.73	172 58 24.75	4.5352471

#### ROUND, DOUGLAS COUNTY.

(Not occupied.)

On a gradually sloping, round, low hill about 15 miles east of Ephrata. Creston Hochstatter's homestead cabin is about 150 yards south of signal, and is reached by a road from Wilson Creek.

Signal: A lumber tripod 12 feet high centered over mark.

Station mark: A bronze triangulation tablet cemented in a rock and placed in ground, level with surface.

[Latitude  $47^{\circ} 15' 51.52''$ . Longitude  $119^{\circ} 12' 15.20''$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Wheeler .....	307 56 50	128 02 52	4.11895
Lewis .....	56 48 06	236 41 15	4.14839

#### ST. ANDREWS, DOUGLAS COUNTY.

On the highest point of a long rocky butte lying about 6 miles north-west of St. Andrews post-office and 8 miles west of Mold post-office. There are roads from both of these places to foot of butte, which is known locally as "Moses Coulee Butte." Station is about 500 yards south of F. A. Wood's house, which is a good place to camp, provided the animals in camp are few.

Station mark: A bronze triangulation tablet cemented in a stone which was placed in ground, level with surface, and under center of a cairn 7 feet high.

[Latitude 47° 44' 29.67". Longitude 119° 32' 10.06%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Guske .....	42 19 56.88	222 11 42.06	4. 3172329
Dewey .....	88 37 07.45	268 25 52.73	4. 2787582
Dyer .....	146 49 39.93	326 39 05.15	4. 5110898
Ragged .....	201 13 25.25	21 20 00.25	4. 4843208
Stevenson .....	223 46 43.61	44 04 21.07	4. 6304312
Pilot .....	290 03 13.28	110 12 17.04	4. 2126215
McDonald .....	339 45 11.00	159 48 51.97	4. 2564234

SADDLE (2), DOUGLAS COUNTY.

Station is on a high prominent part of the Saddle Mountains, about 5 miles west of the highest point, and is the most prominent point on the range between Saddle Peak and Columbia River. There are two points close together, and station is on the one farthest north, overlooking Crab Creek. To go to station from Crab Creek, take horse trails leading up mountain from point on Crab Creek about 7 miles below Ben Hutchinson's ranch. These trails are range-horse trails, and spread in all directions, but the plainest ones lead to the summit to the right or west of station. Signal is in view from most places on summit. There is a good horse trail from Saddle Peak to Saddle (2) along the summit, so that Saddle (2) can be easily reached by ascending the mountain at Ben Hutchinson's ranch and keeping west along the summit.

Station mark: A bronze triangulation tablet cemented in a rock placed in ground, level with surface, and under center of a cairn 7 feet high.

[Latitude 46° 48' 47.81". Longitude 119° 40' 20.86%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Coal .....	35 43 30.11	215 34 10.37	4. 4475609
Sentinel .....	92 09 06.03	272 00 45.13	4. 1635532
Columbia .....	137 46 58.52	317 36 34.61	4. 4292627
Frenchman .....	193 05 30.31	13 07 43.69	4. 2317882
McManamon .....	238 12 14.82	58 26 20.98	4. 4600587
Crab .....	279 01 52.50	99 17 12.86	4. 4333970



SAND, DOUGLAS COUNTY.

On a ridge of low sand hills 13 miles southeast of Quincy and 6 miles N. 76° W. from John McMann's house. No other description can be given of this station, and it can best be found by taking true bearing from Quincy schoolhouse (329° 54') or McMann's triangulation station (286° 39').

Signal: A lumber tripod 14 feet high.

Station mark: A bronze triangulation tablet cemented in granite block and placed in ground, level with surface, under center of signal.

[Latitude 47° 07' 35.38". Longitude 119° 40' 09.15%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Columbia.....	50 48 51	230 38 17	4. 37314
Frenchman.....	348 46 16	168 48 21	4. 26871

SAND HILL, DOUGLAS COUNTY.

(Not occupied.)

The sand hill farthest east of a chain of sand hills, extending from Moses Lake to about 10 miles southeast of John Lewis's house and 400 yards west of Ephrata and White Bluff road.

Signal: A tripod 10 feet high.

Station mark: A bronze triangulation tablet cemented in a block of lava and placed in ground, with top 8 inches above surface.

[Latitude 47° 04' 04.23". Longitude 119° 14' 13.84%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Jackson.....	323 41 52	143 47 13	4. 19569
McManamon.....	33 15 49	213 10 51	4. 19647

SCHLAGEL, DOUGLAS COUNTY.

On the highest point of a ridge forming the divide between Grand Coulee and Crab Creek, and the highest ridge between Stafford and Coulee City. It is about 6 miles northwest of Stafford, and there is a road all the way to it from that place. Station is on the land of Antonio Schlagel, said to be in sec. 17, T. 23, R. 28, and is 17 steps slightly west of north of Dent Pugh's northeast corner and Bob Love's northwest corner, being in the middle of Antonio Schlagel's south line. There is a road along the south line.

Signal: A lumber tripod 9 feet high.

Station mark: A bronze triangulation tablet cemented in a block of lava and placed in ground, level with surface, centered under signal.

[Latitude 47° 28' 58.90". Longitude 119° 19' 54.87".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Lewis .....	3 45 05	183 43 51	4. 50653
Three Springs .....	78 05 58	257 56 05	4. 23735
Severson .....	277 22 38	97 28 41	4. 01695

SENTINEL, DOUGLAS COUNTY.

On a prominent point of Sentinel Bluffs on the south side of Crab Creek and about 4 miles from the mouth of that creek. Station is on the highest point of the bluffs, and right on the north edge, overlooking Crab Creek. From here the country slopes down to Columbia River and east to a saddle between this range and the Saddle Mountains. Sentinel Bluffs is a continuation of the Saddle Mountains. Station is about 5 miles up Crab Creek from Cregg's ferry and 15 miles down the creek from Ben Hutchinson's ranch. The best way to go is by trail from Crab Creek, about 7 miles below Hutchinson's ranch—the same trail leads to Saddle (2)—and when well up the mountain take a right-hand trail leading along close to the bluff edge nearly all the way. There seems to be another trail from Crab Creek about 5 miles farther down the creek. There is good but steep foot traveling straight to signal from Crab Creek, at a point directly under signal, distant 1 mile. A pack animal could go this way, but footing is bad in places and very steep.

Station mark: A bronze triangulation tablet cemented in a rock placed in ground, level with surface, under center of a cairn 6 feet high.

[Latitude 46° 49' 04.96". Longitude 119° 51' 47.82".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Coal .....	4 16 55.34	184 15 55.66	4. 3686394
Moxee .....	52 39 03.81	232 22 36.58	4. 5598550
Johnson .....	100 46 18.35	280 32 10.40	4. 3990825
Columbia .....	169 37 56.52	349 35 54.22	4. 2936977
Frenchman .....	228 46 51.30	48 57 26.19	4. 3881650
Saddle (2) .....	272 00 45.13	92 09 06.03	4. 1635532

## SEVERSON, DOUGLAS COUNTY.

On the summit of a high, prominent ridge about 7 miles northeast of Stratford, about 16 miles south and west from Hartline, and 3 miles west of main road from Hartline to Wilson Creek. Station is in Severson pasture, 50 yards west of a seldom-used lane which goes up the north side of hill and stops at the summit. There is a road from Stratford. Take Wilson Creek road to Richardson's ranch at east end of lake, cross ditch and railway, leaving Richardson's to left, and take road up big draw, then ranch roads to Severson's:

Signal: A lumber tripod 14 feet high, with two targets on top, center over mark.

Station mark: A bronze triangulation tablet cemented in a stone and placed in ground, level with surface.

[Latitude 47° 28' 15.33". Longitude 119° 11' 42.43".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Lewis .....	22 07 00.20	201 59 44.73	4.5199865
Blythe .....	46 23 19.04	226 08 06.12	4.5568617
Three Springs.....	85 25 32.28	265 09 35.00	4.4362287
McDonald.....	124 12 03.62	304 00 38.58	4.3703550
Pilot Rock.....	157 14 19.61	337 08 15.93	4.4241162
Flynn.....	194 56 08.15	15 01 03.78	4.5098451
Wheeler.....	342 41 17.33	162 46 55.46	4.5123249

## STEVENSON, DOUGLAS COUNTY.

On the highest part of a round-topped ridge, about 10 miles southwest of Barry post-office. It is the highest point in the vicinity, although not very prominent. Stevenson's ranch and lake lie about 1 mile south of station. Going from Barry to Leahy on what is known as the Chelan road, station is about 2 miles to right of road. The hill on which it is located is between the Columbia River and the Grand Coulee, and from here the country breaks off to the point of junction of the two.

Signal: A lumber tripod 14 feet high, with two white-and-black targets on top.

Station mark: A bronze tablet cemented in rock and placed in ground, level with surface.

[Latitude 48° 01' 05.45". Longitude 119° 08' 24.41".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Pilot .....	21 36 49.03	201 28 16.95	4. 5921888
St. Andrews .....	44 04 21.07	223 46 43.61	4. 6304312
Ragged .....	82 54 35.31	262 43 31.58	4. 2708217
Salt Lake .....	126 29 10.20	306 10 22.77	4. 5896290
Moses .....	188 18 39.02	8 22 06.87	4. 5988281
Flynn .....	351 53 57.43	171 56 27.46	4. 4755802

## ST. ANDREWS SCHOOLHOUSE, DOUGLAS COUNTY.

Station mark: A small projection on end of roof.

[Latitude 47° 39' 19.40". Longitude 119° 26' 08.25".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
McDonald .....	10 07 52	190 07 06	3. 87328
St. Andrews .....	141 49 37	321 45 10	4. 08622

## TIMBER PEAK, DOUGLAS COUNTY.

(Not occupied.)

A small, prominent timbered peak about 5 miles north of Dyer and several miles southwest of Bridgeport, on top of the high country overlooking Columbia River. Highest tree sighted.

[Latitude 48° 03' 19.0". Longitude 119° 45' 04.0".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Dewey .....	4 38 19	184 36 37	4. 55015
St. Andrews .....	335 10 34	155 20 08	4. 58440

## THREE SPRINGS, DOUGLAS COUNTY.

On the highest point of ridge, overlooking Soap Lake, or Alkali Lake as it is marked on some maps. Station is about three-fourths of a mile south of the Three Springs ranch and about 5 miles, by road, to the north of the south end of Soap Lake. A good road leads from Soap Lake to the Three Springs ranch, and this road passes within

about 50 or 75 yards of signal. Take road from Soap Lake leading into the hills until a crossroad is reached, then take the right-hand end of crossroad to summit. The left end of crossroad goes to Ephrata; the middle road to Sage Brush flat.

Station mark: A bronze triangulation tablet set in a stone and placed in ground, level with surface, under center of a cairn 7 feet high.

[Latitude 47° 27' 02.78". Longitude 119° 33' 21.64".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Two Springs .....	23 40 07.56	203 35 54.80	4.2546860
Baird .....	52 05 17.45	231 54 24.77	4.3730495
Badger .....	94 39 29.95	274 20 42.34	4.5071933
Guske .....	143 40 32.95	323 33 12.08	4.3238180
McDonald .....	206 41 10.97	26 45 44.23	4.2364733
Severson .....	265 09 35.00	85 25 32.28	4.4362287
Lewis .....	332 22 05.83	152 30 45.60	4.5063587
Blythe .....	356 54 44.17	176 55 26.91	4.3562817

#### TWO SPRINGS, DOUGLAS COUNTY.

Station is on one of the highest hills lying northwest of Ephrata and northeast of Winchester. It is about 5 miles from Winchester and can be reached best from that place. Take road running north-northwest from Winchester, which goes up a ravine to summit of ridge. On reaching summit go east along divide about 2 miles until station is reached. A wagon can go this way.

Station mark: A bronze triangulation tablet cemented in a rock and placed in ground, under center of a cairn 8 feet high.

[Latitude 47° 18' 09.54". Longitude 119° 39' 05.15".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Baird .....	99 40 05.38	279 33 25.97	4.0635489
Three Springs .....	203 35 54.80	23 40 07.56	4.2546860
Blythe .....	306 18 19.50	126 23 14.55	4.0204556

#### WEBBER'S WINDMILL, DOUGLAS COUNTY.

(Not occupied.)

Four miles south and west from Quincy.

Station mark: Center of tower of windmill.

[Latitude 47° 11' 45.99". Longitude 119° 51' 57.38".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Columbia.....	8 22 05	188 20 09	4. 36040
Hill.....	78 17 10	258 12 38	3. 90140

WHEELER, DOUGLAS COUNTY.

On a sagebrush ridge, about 6 miles north of Wheeler post-office and 1 mile southeast of Rickard's ranch, on the old Wilson Creek and White Bluff road. This road passes through Rickard's field, and station is 1 mile east of where it leaves the field on the south side. This is not a very prominent point, as the country rises to the east of it. Water at Rickard's ranch.

Signal: A lumber tripod 14 feet high, with targets on-top.

Station mark: A bronze triangulation tablet cemented in a stone and placed in ground, level with surface.

[Latitude 47° 11' 29.36". Longitude 119° 04' 02.57".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Jackson.....	7 50 22.96	187 48 17.09	4. 4256706
McManamon.....	38 44 26.99	218 32 00.89	4. 5369961
Lewis.....	91 05 09.77	270 52 17.91	4. 3453875
Severson.....	162 46 55.46	342 41 17.33	4. 5123249

WINCHESTER, DOUGLAS COUNTY.

Station mark: The highest chimney on the section house at Winchester.

[Latitude 47° 14' 58.61". Longitude 119° 43' 27.08".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Blythe.....	271 13 37	91 21 45	4. 14484
Frenchman.....	346 15 28	166 19 58	4. 51634

KUNTZ, FRANKLIN COUNTY.

(Not occupied.)

On a sagebrush flat about 10 miles southwest of Scooten Springs, on about as high point as any near there. It shows most prominently from Gable Mountain at White Bluff and is about 10 miles in direct

line from White Bluff ferry. Take bearing from Gable and cross the Columbia at White Bluff and go east until a small coulee is crossed. Station is on the east bank of this coulee, on one of several small sandhills.

Signal: A tripod 14 feet high with targets on top.

Station mark: A bronze triangulation tablet cemented in stone and placed in ground, level with surface.

[Latitude 46° 37' 42.32". Longitude 119° 12' 35.62".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Saddle .....	126 37 38	306 22 22	4. 52160
Crab .....	152 12 43	332 10 50	4. 26365

#### SCOOTEN, FRANKLIN COUNTY.

(Not occupied.)

On a prominent butte about 2½ miles east of Scooten Springs. Take road from Scooten Springs by the corral to top of hill, then left-hand road, which passes to left of signal.

Signal: A tripod made of lumber.

Station mark: A bronze triangulation tablet cemented in a rock and placed in ground, level with surface.

[Latitude 46° 42' 44.10". Longitude 119° 04' 43.66".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Crab .....	110 30 56	290 20 19	4. 29685
Jackson .....	174 07 31	354 05 55	4. 43167

#### JOHNSON, KITTITAS COUNTY.

On the highest point of the ridge between Honson and Johnson creeks, and at the head of these creeks, being about 20 miles south-east of Ellensburg. Taking the road from Ellensburg to Cregg's ferry, station is about 2 miles north of the highest point of said road, and by leaving the road at this point a wagon can be taken all the way. Water in "Mud Springs," one-half mile south of station. Plenty of grass when the sheep are gone.

Station mark: A bronze triangulation tablet cemented in solid rock, under center of a cairn 8 feet high.

[Latitude 46° 51' 35.03". Longitude 120° 11' 10.29".

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Moxee .....	8 45 51.23	188 43 30.23	4.4319569
Atanum .....	39 23 01.66	219 05 13.83	4.6928859
Wenas .....	85 18 41.83	265 03 40.72	4.4193073
Columbia .....	234 57 20.01	55 09 26.83	4.4096007
Sentinel .....	280 32 10.40	100 46 18.35	4.3990825
Coal .....	320 30 00.76	140 43 07.55	4.5581070

SQUAW, KITTITAS COUNTY.

On a round hill on the dividing ridge between Squaw and Selah creeks, about 3 miles north of Selah Springs. Road from North Yakima, via Selah Springs to Ellensburg, passes about 500 yards west of station. From Yakima keep this road about 16 miles to the summit of above-mentioned divide, then take the ridge to right to the top of a round hill which is in sight. Station is on the same ridge as "Hog Ranch" triangulation station. Water 3 miles south at Selah Springs and 3 miles north on Squaw Creek, both on Ellensburg and North Yakima road.

Signal: A lumber tripod 14 feet high with targets.

Station mark: A bronze triangulation tablet set in a block of soft sandstone and placed in ground, top of stone projecting 3 inches above surface. This stone is the only one of the kind on the hill.

[Latitude 46° 44' 20.9". Longitude 120° 20' 30.2".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Wenas .....	128 06 05	307 57 53	4.25962
Johnson .....	221 28 41	41 35 29	4.23505
Moxee .....	329 39 14	149 43 41	4.18823
Atanum .....	38 00 50	217 49 48	4.49717

WENATCHEE, KITTITAS AND CHELAN COUNTIES.

(Not occupied.)

On one of the prominent summits of Wenatchee Mountain; the summit farthest east. Station is at the head of Squillchuckchee Creek. Take road from Wenatchee to Squillchuckchee schoolhouse and saw-mill road up divide between said creek and another creek with a name as difficult to pronounce, sounding something like "Steamout."



Leave sawmill road where it leaves divide and keep up divide to station. The Ellensburg and Wenatchee trail crosses the summit about 5 miles east. Station is about 20 miles from Wenatchee.

Signal: A pine tree trimmed to a bush on top, 25 feet high; tree leans to east.

Station mark: A bronze triangulation tablet cemented in a rock and placed in ground, with top 6 inches above surface.

[Latitude 47° 16' 25.64". Longitude 120° 24' 26.36%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Badger .....	235 15 13	55 33 59	4. 59219
Baird .....	263 22 03	83 48 43	4. 66316

#### WHISKEYDICK, KITITAS COUNTY.

(Not occupied.)

On the highest point of Whiskeydick Mountain, about 17 miles east of Ellensburg. This mountain lies at the foot of Wenatchee Mountain to the south, and is bare of timber.

Station mark: A bronze triangulation tablet cemented in a rock and placed in ground, level with surface, under center of a cairn 6 feet high.

[Latitude 47° 01' 16.38". Longitude 120° 13' 31.77%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Wenas .....	49 02 58	228 49 39	4. 48692
Johnson .....	350 31 20	170 33 03	4. 26006

#### BUNCH GRASS, OKANOGAN COUNTY.

(Not occupied.)

A bunch-grass hill, several miles northwest of Brewster, having some timber on north side and summit.

Station mark: Top of highest tree.

[Latitude 48° 09' 09.8". Longitude 119° 51' 22.3%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Salt Lake .....	249 43 42	69 56 55	4. 36930
Dyer .....	341 42 40	161 46 20	4. 29167

## CHELAN, OKANOGAN COUNTY.

On the highest butte south of Lake Chelan, on north side of Columbia River, about 2 miles west of Chelan River. A good trail from the post-office at Lakeside leads almost to summit.

Station mark: A rock cairn 8 feet high, under center of which a copper bolt is cemented in solid rock.

[Latitude  $47^{\circ} 48' 18.96'' a$ ;  $47^{\circ} 48' 23.91'' b$ . Longitude  $120^{\circ} 01' 54.86'' a$ ;  $120^{\circ} 02' 07.39'' b$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Stuart <sup>a</sup> .....	60 50 48.86	240 12 19.28	4.8747277
Stormy <sup>a</sup> .....	113 09 53.71	292 55 45.05	4.4126532
Pyramid <sup>a</sup> .....	127 27 18.57	307 03 32.08	4.6998075
North Navarre <sup>a</sup> .....	148 58 35.20	328 45 34.49	4.6250057
Cooper <sup>a</sup> .....	170 36 32.45	350 34 18.09	4.3617212
Baldy <sup>a</sup> .....	106 03 07.68	285 50 00.62	4.3610958
Cooper <sup>b</sup> .....	170 35 27.68	350 33 13.05	4.3617197
Dyer <sup>b</sup> .....	224 24 34.33	44 36 12.71	4.4454873
Dewey <sup>b</sup> .....	292 38 04.30	112 49 00.15	4.3008639
Guske <sup>b</sup> .....	313 44 34.10	133 58 28.50	4.5134122
Badger <sup>b</sup> .....	353 41 45.54	173 44 09.91	4.5713228

<sup>a</sup> Ellensburg base.

<sup>b</sup> Spokane base.

## COOPER, NEAR OKANOGAN-CHELAN COUNTY LINE.

On a large, pyramidal rock on a timbered mountain, about 5 miles northeast of the shore of Lake Chelan.

Station mark: A copper bolt cemented in solid rock.

Reference mark: A bronze triangulation tablet, stamped "R. P.," cemented in solid rock, 1.6 feet northwest of station mark.

[Latitude  $48^{\circ} 00' 33.61'' a$ ;  $48^{\circ} 00' 38.52'' b$ . Longitude  $120^{\circ} 04' 55.93'' a$ ;  $120^{\circ} 05' 08.80'' b$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Indian <sup>a</sup> .....	20 29 53.08	200 26 30.71	4.2088432
Stormy <sup>a</sup> .....	57 57 02.27	237 45 06.71	4.3731776
Chelan <sup>a</sup> .....	350 34 18.09	170 36 32.45	4.3617212
Dyer <sup>b</sup> .....	276 44 09.94	96 58 04.26	4.3699991
Dewey <sup>b</sup> .....	323 47 37.27	144 00 48.68	4.5756229
Chelan <sup>b</sup> .....	350 33 13.05	170 35 27.68	4.3617197

<sup>a</sup> Ellensburg base.

<sup>b</sup> Spokane base.

## MOSES, OKANOGAN COUNTY.

On a high, timbered mountain, 12 or 15 miles northwest from Indian agency on Nespilem River, locally known as Moses Mountain. Trail up the Nespilem River passes about 4 miles east from station. The mountain is covered with dead timber.

Station mark: A pine tree about 20 feet high.

Reference mark: An aluminum bolt marked  $\triangle$  set in a large rock  
U. S.  
G. S.

25.8 feet distant N. 22° 20' E. (true) from tree.

[Latitude 48° 22' 17.30". Longitude 119° 03' 45.56%.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Bonaparte .....	174	26	46.28	354	24	02.01	4.6647018
Fir.....	195	53	38.76	15	59	18.90	4.5304707
Summit .....	241	08	20.14	61	34	19.69	4.6879590
Paint Rock .....	261	21	47.56	81	46	57.74	4.6231881
Whitestone.....	313	16	09.35	133	40	50.25	4.7523117
Ragged.....	30	18	21.95	210	03	48.55	4.6825417

## SALT LAKE, OKANOGAN COUNTY.

On a low timbered hill 5 or 6 miles east of Malott, on west side of Okanogan River and 13 miles southeast from Alma post-office and ferry. The hill is highest point in immediate vicinity and has salt lakes on every side of it.

Station mark: A pine tree trimmed up for signal. (Now dead, 1903.)

Reference mark: A copper bolt marked U. S. G. S. set in solid rock 21 feet west from tree.

[Latitude 48° 13' 31.03". Longitude 119° 33' 38.62%.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Buck .....	140	12	24.31	320	00	28.29	4.4854816
Omach .....	216	38	22.64	36	49	35.99	4.4918667
Moses .....	246	04	17.57	66	26	36.30	4.6060805
Keller .....	287	31	18.60	108	05	26.64	4.7760002
Stevenson .....	306	10	22.77	126	29	10.20	4.5896290
Ragged .....	333	03	59.51	153	11	41.97	4.4537844
Dyer .....	30	51	27.60	210	41	56.32	4.4917360

ATANUM, YAKIMA COUNTY.

On the highest point of Atanum Ridge, a low, flat, bare ridge extending east and west between the Atanum and Toppenish valleys. The station is about 8 miles southwest of North Yakima.

Station mark: A copper bolt marked U. S. G. S. set in drill hole in solid rock and having erected over it a rock cairn 7 feet high.

[Latitude  $46^{\circ} 30' 54.33''^a$ ;  $46^{\circ} 30' 58.30''^b$  Longitude  $120^{\circ} 35' 26.31''^a$ ;  $120^{\circ} 35' 37.84''^b$ ]

To station—	Azimuth.	Back azimuth.	Log. distance.
	o ' "	o ' "	Meters.
Satas <sup>a</sup> .....	23 17 27.66	203 10 28.93	4.4959478
Signal Peak " .....	52 41 02.97	232 17 24.47	4.7226954
Cowiche <sup>a</sup> .....	108 03 32.20	287 50 02.40	4.3975856
Burge <sup>a</sup> .....	153 21 46.74	333 13 04.85	4.5308826
Umptanum <sup>a</sup> .....	172 06 07.81	352 03 02.59	4.5936962
Wenas <sup>a</sup> .....	187 48 13.22	7 51 02.49	4.5600570
Yakima <sup>a</sup> .....	211 54 03.56	31 57 25.79	4.0499121
Hembree <sup>a</sup> .....	316 39 09.72	136 52 01.43	4.5214335
Lone Pine <sup>a</sup> .....	357 28 26.78	177 29 53.40	4.7675891
Lone Grave <sup>a</sup> .....	335 21 06.69	155 27 33.08	4.4374943
Wenas <sup>b</sup> .....	187 47 33.61	7 50 22.69	4.5601806
Johnson <sup>b</sup> .....	219 05 13.83	39 23 01.66	4.6928859
Moxee <sup>b</sup> .....	246 57 40.00	67 13 05.11	4.4691535

<sup>a</sup> Ellensburg base.

<sup>b</sup> Spokane base.

COAL, YAKIMA COUNTY.

On a round hill on the divide between Coal Creek and Columbia River, and almost opposite the lower end of Priest Rapids. Station is almost 4 miles (straight) a little south of west from Juniper Springs and 6 miles east of Tom Smith's ranch. Take road down Coal Creek from Smith's until the road passes between a sheep corral on the left and a small house on the right. Go up spur to left at this house, thence east across a ravine, then north up ridge to station. Water is in Coal Creek 1 mile south of station. From Juniper Springs take road up said divide between Coal Creek and Columbia River, and, where road goes down toward Coal Creek, keep west along summit to station.

Station mark: A bronze triangulation tablet cemented in a stone and placed in ground, level with surface, under center of a cairn 7 feet high.

[Latitude 46° 36' 30.28". Longitude 119° 53' 09.80".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Moxee .....	92 41 44.18	272 26 18.24	4.4335927
Johnson .....	140 43 07.55	320 30 00.76	4.5581070
Sentinel .....	184 15 55.66	4 16 55.34	4.3686394
Saddle (2) .....	215 34 10.37	35 43 30.11	4.4475609

## HOG RANCH, YAKIMA COUNTY.

(Not occupied.)

Station is on the highest point of divide between the head of Selah and Squaw creeks. From here the country drops off to Coal Creek and Columbia River. There are two high points on the range, known as the Hog Ranch Buttes. Station is on the one farthest east, being about 4 miles northeast of "Hog Ranch" and 20 miles from North Yakima.

Station mark: A bronze triangulation tablet cemented in a rock and placed in ground, level with surface, under center of a cairn 6 feet high.

[Latitude 46° 39' 52.03". Longitude 120° 06' 53.53".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Wenas .....	121 46 58	301 28 51	4.57046
Johnson .....	165 56 10	345 53 03	4.34992

## MOXEE, YAKIMA COUNTY.

On a very prominent point of the divide between the Moxee Valley and Selah Creek, the highest point of the divide being a few miles farther east, about the head of Selah and Coal creeks. Station is about 4 miles southwest of "Hog Ranch" and about 15 miles east of North Yakima. The road from North Yakima to Ellensburg on the east side of the Yakima River crosses sand divide about 3 miles east of station. There is also a road from North Yakima to "Hog Ranch" which passes within 2 miles of station on the north side. From this road the ascent is easy, and the best way up can be seen.

Station mark: A bronze triangulation tablet cemented in a stone and placed in ground, level with surface, under center of a cairn 6 feet high.

[Latitude 46° 37' 09.64". Longitude 120° 14' 23.91".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Atanum .....	67 13 05.11	246 57 40.00	4.4691535
Wenas .....	138 03 21.11	317 50 42.75	4.5187656
Johnson .....	188 43 30.23	8 45 51.23	4.4319569
Sentinel .....	232 22 36.58	52 39 03.81	4.5598550
Coal .....	272 26 18.24	92 41 44.18	4.4435927

GABLE, YAKIMA COUNTY.

(Not occupied.)

Station is on the east end of Gable Mountain, being about 5 miles S. 5° W. from White Bluff ferry. Hill is easiest to climb on the south side. Station is on the farthest west of two points at the east end of the range, and is not over 2 miles from Columbia River. The point 300 yards east of station is free from stones and probably a little higher than that on which station is situated.

Station mark: A bronze triangulation tablet, cemented in solid rock under center of a cairn 7 feet high.

[Latitude 46° 38' 58.78". Longitude 119° 27' 58.65".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Crab .....	209 36 05	29 42 24	4.34944
Saddle .....	162 49 32	342 45 28	4.38096

WENAS, YAKIMA COUNTY.

On the high, east end of Umptanum Ridge, overlooking the Yakima River, about 12 miles south of Ellensburg.

Station mark: A copper bolt marked U. S. G. S. cemented in drill hole in a small boulder set in the ground, over which is a rock cairn 6 feet high.

[Latitude  $46^{\circ} 50' 23.67''$ ; <sup>a</sup>  $46^{\circ} 50' 19.34''$ , <sup>b</sup> Longitude  $120^{\circ} 31' 45.43''$ ; <sup>a</sup>  $120^{\circ} 31' 33.65''$ , <sup>b</sup>]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Atanum <sup>a</sup> .....	7	50	22.69	187	47	33.61	4.5601806
Johnson <sup>a</sup> .....	265	03	40.72	85	18	41.83	4.4193073
Moxee <sup>a</sup> .....	317	50	42.75	138	03	21.11	4.5187656
Atanum <sup>b</sup> .....	7	51	02.49	187	48	13.22	4.5600570
Cowiche <sup>b</sup> .....	45	29	49.62	225	13	28.29	4.6047034
Burge <sup>b</sup> .....	74	26	52.79	254	15	19.85	4.3206371
Umptanum <sup>b</sup> .....	105	40	53.38	285	34	57.91	4.0301322
Normal School <sup>b</sup> .....	176	33	39.13	356	33	02.19	4.2506572
Manastash <sup>a</sup> .....	139	11	08.66	319	05	07.71	4.2040216

<sup>a</sup>Spokane base.

<sup>b</sup>Ellensburg base.

## WYOMING.

### TRIANGULATION STATIONS.

Albany, Carbon, Johnson, and Natrona counties; Alcovia, Broken Horn, Casper, Fort McKinney, Fort Steele, Griggs, Laramie, and Medicine Bow quadrangles.

During the field season of 1903, Mr. Sledge Tatum, topographer, extended triangulation from County Road and Gale stations in Albany County, northwestward, connecting with stations dependent upon the Wheeler astronomic station at Fort Steele, and upon the base line measured by Mr. Frank Tweedy, in 1901, west of that place. The work was then extended due north to the vicinity of Buffalo and connected with stations McKinney and Buffalo, located from the Ranchester base and Sheridan astronomic station.

Positions were computed on the United States standard datum as derived from stations Morrison and Table Mound of the United States Coast and Geodetic Survey transcontinental system, through the Colorado triangulation.

An azimuth and distance check was obtained on the line Mount Steele—St. Mary, the Fort Steele observed azimuth being adopted for the computation of positions northward as far as Buffalo. The connection at the latter point furnished an approximate correction by which to reduce all published positions in Johnson, Sheridan, and Big Horn counties and in the Teton Forest Reserve to the United States standard datum.

## JELM, ALBANY COUNTY.

Situated about 3 miles east-southeast of Woods post-office, on highest part of mountain of that name. A tripod of poles is erected over center.

Station mark: A bronze triangulation tablet cemented in solid rock.

[Latitude  $41^{\circ} 05' 49.71''$ . Longitude  $105^{\circ} 58' 35.22''$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Pelham .....	83 25 25.09	262 57 32.98	4.7770893
Medicine Bow .....	135 47 48.15	315 34 20.44	4.6112707
County road .....	218 46 30.98	38 57 11.68	4.5573836
Gale .....	279 58 02.71	100 13 17.46	4.5187373

## CHALK HILL, CARBON COUNTY.

Situated about 18 miles north of Shirley post-office and 20 miles south of Winthrop, on highest ground between the two. About 3 miles east of road leading from Shirley to Winthrop.

Signal: A quadripod made of pine poles.

Station mark: An iron bench-mark post set 3 feet in ground.

[Latitude  $42^{\circ} 20' 33.67''$ . Longitude  $106^{\circ} 28' 20.16''$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Shirley .....	19 26 37.32	199 23 15.15	4.3166558
Pedro .....	82 45 30.10	262 30 52.22	4.4785807
Alcova .....	144 02 37.01	323 50 30.75	4.6202515
Casper .....	191 32 26.58	11 36 54.80	4.6542006

## ELK, CARBON COUNTY.

A high, dome-shaped mountain about 15 miles south of Hanna and about 10 miles west of Elk Mountain post-office. The mountain is precipitous, with much down timber, making ascent difficult. The most practicable route is from Rattlesnake Pass, on northwest side. At one time there was a trail along this route, but at present only traces are found at intervals. Time required to ascend peak, six hours. Summit is above timber line and consequently bald.

Station mark: A cairn about 5 feet in diameter at base and about 6 feet high.



Reference mark: A bronze triangulation tablet cemented in solid rock; true azimuth from station mark,  $198^{\circ} 19' 22''$ ; distance, 13.1 feet.

[Latitude  $41^{\circ} 37' 59.46''$ . Longitude  $106^{\circ} 31' 31.76''$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Needle .....	24 15 36.10	204 07 21.85	4.6261196
Mount Steele .....	120 15 18.52	299 56 28.90	4.6563544
St. Mary .....	124 33 32.78	304 20 57.98	4.5024440
Shirley .....	177 34 44.44	357 33 41.62	4.7731041
Rock .....	288 55 34.17	109 07 25.44	4.4190983
Medicine Bow .....	330 02 02.98	150 10 20.59	4.5434415

#### MEDICINE BOW, CARBON COUNTY.

A high, rocky peak about 12 miles west of Centennial and 12 miles north of Rambler mines, the highest point on what is locally known as the Snowy Range. It can be reached by trail from Rambler with pack mules. The last 1,500 feet is very rocky and steep, but ascent can be made on foot.

Signal: A tripod of poles erected over center.

Station mark: A bronze triangulation tablet cemented in solid rock.

[Latitude  $41^{\circ} 21' 37.35''$ . Longitude  $106^{\circ} 19' 00.74''$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Pelham .....	40 22 16.27	220 07 46.93	4.6776056
Needle .....	76 47 03.61	256 30 34.79	4.5538303
Elk .....	150 10 20.59	330 02 02.98	4.5434415
Rock Mountain .....	198 51 06.06	18 54 38.19	4.3613261
County road .....	271 04 07.40	91 28 19.51	4.7084269
John .....	315 34 20.44	135 47 48.15	4.6112707

#### MOUNT STEELE, CARBON COUNTY.

Situated about 6 miles northwest of Fort Steele, on a high, sharp point on ridge northeast of Platte River.

Station mark: A bronze triangulation tablet cemented in solid rock.

Reference mark: A cairn 7 feet high; true azimuth from station mark,  $79^{\circ} 00' 35''$ ; distance, 6.6 feet.

[Latitude 41° 50' 16.24". Longitude 106° 59' 48.68".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Sage .....	13 33 05.47	193 30 37.00	4. 3429382
Sage (observed) .....	13 33 15.49	193 30 47.02	-----
Pedro .....	194 22 54.94	14 29 26.26	4. 7317413
Shirley .....	224 52 11.10	45 09 53.63	4. 7131835
St. Mary .....	289 59 56.42	110 06 11.52	4. 1405947
St. Mary (observed) .....	290 00 06.44	110 06 21.54	-----
Elk .....	299 56 28.90	120 15 18.52	4. 6563544
Needle .....	340 08 59.43	160 19 29.97	4. 8139785

## NEEDLE, CARBON COUNTY.

A rocky peak 1 mile west of confluence of Grand Encampment Creek and Platte River and 1 mile east of stage road from Encampment to Walcott.

Station mark: A bronze triangulation tablet cemented in solid rock.

Reference mark: A cairn 6 feet high. True azimuth from station mark, 137° 35' 45"; distance, 21.9 feet.

[Latitude 41° 17' 09.37". Longitude 106° 43' 58.26".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Sage .....	145 46 58.35	325 34 01.34	4. 6838707
Mount Steele .....	160 19 29.97	340 08 59.43	4. 8137985
St. Mary .....	171 00 15.64	350 55 58.45	4. 7579061
Elk .....	204 07 21.85	24 15 36.10	4. 6261196
Medicine Bow .....	256 30 34.79	76 47 03.61	4. 5538303
Pelham .....	351 35 16.66	171 37 13.58	4. 4528007

## PEDRO, CARBON COUNTY.

A high, rocky peak on Pedro Mountain, locally known as Monument Peak, situated about 10 miles west of Leo post-office and 4 miles west of Indian Grove ranch.

Station mark: A bronze triangulation tablet cemented in solid rock.

Reference mark: A cairn 7 feet high; true azimuth from station mark, 49° 38' 18"; distance, 7.8 feet.

[Latitude 42° 18' 28.64". Longitude 106° 50' 03.94".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
St. Mary.....	0 30 52.30	180 30 37.46	4.7555596
Mount Steele.....	14 29 26.26	194 22 54.44	4.7317413
Alcova.....	187 53 30.24	7 56 04.65	4.5790943
Reef.....	195 36 57.05	15 45 59.12	4.8293235
Casper.....	218 46 29.84	39 05 39.20	4.7907208
Chalk.....	262 30 52.22	82 45 30.10	4.4785807
Shirley.....	304 12 58.55	124 24 12.85	4.4447572

## PELHAM, CARBON COUNTY.

Situated on a peak  $2\frac{1}{2}$  miles north of divide between Grand Encampment Creek and waters of Big Creek where crossed by Columbine road. It is  $2\frac{1}{2}$  miles north of Colorado-Wyoming State line, is locally known as "Rocky," and is the point called "Pelham" by the King Survey.

Station mark: A bronze triangulation tablet cemented in solid rock.

Reference mark: A cairn 5 feet high; true azimuth from station mark,  $102^{\circ} 42' 17''$ ; distance, 10 feet.

[Latitude 41° 01' 59.69". Longitude 106° 41' 00.61".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Needle.....	171 37 13.58	351 35 16.66	4.4528007
Medicine Bow.....	220 07 46.93	40 22 16.27	4.6776056
John.....	262 57 32.98	83 25 25.09	4.7770893

## ROCK, CARBON COUNTY.

Situated about 3 miles south of Arlington post-office and 1.5 miles east of Rock Creek. The point locally known as Rock Mountain was cleared of timber, and a quadripod signal erected on highest point. Can be reached with pack outfit by blind trail from Arlington. On account of windfalls this point is difficult of approach except by trail.

Station mark: A bronze triangulation tablet cemented in solid rock.

[Latitude 41° 33' 22.12". Longitude 106° 13' 40.34".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Medicine Bow .....	18 54 38.19	198 51 06.06	4.3613261
Elk : .....	109 07 25.44	288 55 34.17	4.4190983
County road .....	297 31 30.06	117 52 12.93	4.6920909

## SAGE, CARBON COUNTY.

Situated about 9 miles southwest of Fort Steele, on south edge of mesa overlooking Sage Creek drainage.

Station mark: A bronze triangulation tablet cemented in solid rock.

Reference mark: A cairn 7 feet high; true azimuth from station mark, 58° 16' 14"; distance, 6 feet.

[Latitude 41° 38' 42.12". Longitude 107° 03' 31.69".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Mount Steele (observed) .....	193 30 47.02	13 33 15.49	.....
Mount Steele .....	193 30 37.00	13 33 05.47	4.3429382
St. Mary .....	227 22 00.52	47 30 43.33	4.3918949
Needle .....	325 34 01.34	145 46 58.35	4.6838707

## SHIRLEY, CARBON COUNTY.

Situated about 5 miles south of Shirley post-office, on highest part of Shirley Mountain. The summit is flat and timbered. A quadripod signal was erected on rocky peak 75 feet high, affording a good view in all directions. The point is difficult of approach on account of windfalls, but it can best be reached from Bear Park, which lies to the southwest about 2 miles.

Station mark: A bronze tablet cemented in solid rock under center of signal.

[Latitude 42° 09' 59.94". Longitude 106° 33' 20.83".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
St. Mary .....	29 52 02.34	209 40 36.55	4.6770115
Mount Steele .....	45 09 53.63	224 52 11.10	4.7131835
Pedro .....	124 24 12.85	304 12 58.55	4.4447572
Casper .....	193 58 16.66	14 06 07.38	4.8175664
Chalk .....	199 23 15.15	19 26 37.32	4.3166558
Elk .....	357 33 41.62	177 34 54.46	4.7731041

## ST. MARY, CARBON COUNTY.

Situated on a high, bare point  $2\frac{1}{2}$  miles north of Walcott station on the Union Pacific Railroad.

Station mark: A bronze triangulation tablet set in a rock 10 by 5 by 2 feet, over which a cairn 6 feet high was erected.

[Latitude  $41^{\circ} 47' 42.61''$ . Longitude  $106^{\circ} 50' 26.08''$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Sage .....	47 30 43.33	227 22 00.52	4.3918949
Mount Steele (observed) (U. S. C. and G. S.) .....	110 06 21.54 110 06 11.52	290 00 06.44 289 59 56.42	} 4.1405947
Pedro .....	180 30 37.46	0 30 52.30	
Shirley .....	209 40 36.55	29 52 02.34	4.6770115
Elk .....	304 20 57.98	124 33 32.78	4.5024440
Needle .....	350 35 58.45	171 00 15.64	4.7579061

## ACCIDENT, JOHNSON COUNTY.

Situated about 8 miles east of Buffalo, on high red butte, three-fourths of a mile south of county road; on the divide between the waters of Clear and Crazy Woman creeks.

Signal: A cairn 7 feet high in John Jones's pasture.

Station mark: Center of cairn.

[Latitude  $44^{\circ} 18' 59.70''$ . Longitude  $106^{\circ} 36' 00.00''$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
The Horn .....	23 16 16.05	203 06 21.37	4.6834349
Cross H .....	47 02 58.73	226 59 56.83	3.8972595
McKinney .....	91 17 08.30	271 09 22.03	4.1700658
Buffalo .....	145 58 31.65	325 54 38.70	4.1196789
Pyrite .....	358 27 18.70	178 27 54.87	4.6333317

## BUFFALO, JOHNSON COUNTY.

Situated on a grassy point on ridge running east and west, about 3 miles north of Buffalo and 3 miles south of Lake De Smet. It is  $2\frac{1}{2}$  miles east of Sheridan and Buffalo stage road.

Station mark: A standard iron bench-mark post.

[Latitude  $44^{\circ} 24' 56.31''$ . Longitude  $106^{\circ} 41' 30.26''$ , mean of Yellowstone Lake-Sheridan astronomic stations. Latitude  $44^{\circ} 24' 53.28''$ . Longitude  $106^{\circ} 41' 33.16''$ , U. S. standard datum.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	''	°	'	''	<i>Meters.</i>
Azimuth station, Sheridan azimuth.	5	04	27.74	185	04	05.30	3.9049104
McKinney, Fort Steele azimuth....	34	57	34.36	214	53	40.64	4.1114789
McKinney, Sheridan azimuth.....	34	58	02.87	214	54	09.10	4.1114584
Ten Sleep, Sheridan azimuth.....	61	46	22.30	241	29	00.70	4.5743590
Cloud Peak, Sheridan azimuth.....	84	45	13.80	264	25	02.95	4.5851407
Shell, Sheridan azimuth.....	123	47	10.45	303	41	39.91	4.0987021
Banner, Sheridan azimuth.....	137	58	13.68	317	48	15.32	4.4489394
Prairie Dog, Sheridan azimuth.....	166	21	40.71	346	18	59.87	4.3315864
Cross H, Sheridan azimuth.....	354	21	26.45	174	22	17.18	4.2141446
Cross H, Fort Steele azimuth.....	354	21	03.57	174	21	52.97	4.2141414
Accident, Fort Steele azimuth.....	325	54	38.70	145	58	31.05	4.1196709

## CROSS H, JOHNSON COUNTY.

Situated 1 mile south of Cross H ranch and three-fourths of a mile east of Buffalo and Casper stage road, on the northwest corner of mesa.

Station mark: An iron bench-mark post.

Reference mark: A cairn 6 feet high; true azimuth from station mark,  $213^{\circ} 28' 17''$ ; distance, 5.2 feet.

[Latitude  $44^{\circ} 16' 05.37''$ . Longitude  $106^{\circ} 40' 20.49''$ .]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	''	°	'	''	<i>Meters.</i>
The Horn.....	18	47	02.98	198	40	09.80	4.6142975
McKinney.....	122	18	29.64	302	13	45.48	4.0281222
Buffalo.....	174	21	52.97	354	21	02.82	4.2141414
Accident.....	226	59	56.83	47	02	58.73	3.8972595
Pyrite.....	349	29	43.30	169	33	20.72	4.5823721

## "E. K.," JOHNSON COUNTY.

Situated on highest bald knob of long timbered mountain, about 8 miles south of Mayoworth post-office and 5 miles west of "E. K." Mountain. Can be easily approached from the south.

Station mark: A bronze triangulation tablet cemented in solid rock.

Reference mark: A cairn 6 feet high on the highest point of mountain; true azimuth from station mark,  $0^{\circ} 15' 49''$ ; distance, 9.9 feet.

[Latitude  $43^{\circ} 47' 01.14''$ . Longitude  $106^{\circ} 53' 12.23''$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Goodwater .....	0 15 48.53	180 15 43.17	4.5797219
The Horn .....	194 56 57.59	14 59 00.87	4.1872692
Pyrite .....	236 02 24.22	56 14 55.40	4.4647547
Sussex .....	269 30 49.91	89 44 22.50	4.4192950
Tisdale .....	322 30 01.39	142 45 01.06	4.6829112

#### GOODWATER, JOHNSON COUNTY.

Situated at head of Spring Creek, about 3 miles west of MacDonald's ranch, on northwest end of high mesa overlooking Buffalo Creek drainage.

Station mark: A bronze triangulation tablet cemented in solid rock.

Reference mark: A cairn 6 feet high; true azimuth from station mark,  $70^{\circ} 30' 03''$ ; distance, 4.5 feet.

[Latitude  $43^{\circ} 26' 30.05''$ . Longitude  $106^{\circ} 53' 20.00''$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
"E. K." .....	180 15 43.17	0 15 48.53	4.5797219
Sussex .....	214 40 10.34	34 53 45.77	4.6671543
Tisdale .....	270 27 09.97	90 42 12.16	4.4699451
Broken Horn .....	335 43 19.87	155 46 09.07	4.1302162

#### PYRITE, JOHNSON COUNTY.

A high, red, dome-shaped prairie hill, situated at the head of Dry Creek on the divide between the waters of Powder River and Crazy Woman Creek, about 14 miles east of Ono post-office and 6 miles east of Casper and Buffalo stage road.

Station mark: A bronze triangulation tablet cemented in solid rock.

Reference mark: A cairn 5 feet high, erected on solid pyrite rock 5 feet in diameter and projecting 2 feet above surface; true azimuth from station mark,  $72^{\circ} 04' 35''$ ; distance, 5.6 feet.

[Latitude 43° 55' 47.47". Longitude 106° 35' 08.05%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
"E. K." .....	56 14 55.40	236 02 24.22	4.4647577
The Horn .....	86 11 48.00	266 01 19.35	4.3067164
Cross H .....	169 33 20.72	349 29 43.30	4.5823721
Accident .....	178 27 54.87	358 27 18.70	4.6333317
Sussex .....	352 50 58.69	172 52 01.17	4.2094758

## SUSSEX, JOHNSON COUNTY.

Situated about 7 miles north of Kaycee, and 12 miles northwest of Sussex, on highest point of ridge running north and south; about 2 miles east of north fork of Powder River and 6 miles north of mouth of middle fork of Powder River. It can be reached from Kaycee by following Buffalo road to crossing of north fork and at intersection of Buffalo road with Powder River road take dim road east to foot of ridge one-half mile west of station.

Station mark: A bronze triangulation tablet cemented in solid rock.

Reference mark: A cairn 7 feet high; true azimuth from station mark, 318° 31' 40"; distance, 5.7 feet.

[Latitude 43° 47' 06.70". Longitude 106° 33' 37.87%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Goodwater .....	34 53 45.77	214 40 10.34	4.6671543
"E. K." .....	89 44 22.50	269 30 49.91	4.4192950
The Horn .....	123 32 14.31	303 20 44.01	4.4260360
Pyrite .....	172 52 01.17	352 50 58.69	4.2094743
Tisdale .....	355 39 16.77	175 40 46.41	4.5862861

## THE HORN, JOHNSON COUNTY.

Situated on a high rocky limestone ridge near southern end of mountain range locally known as The Horn, about 3 miles west of Edgar Simmons's house. It can be best reached by following trail from Mr. Simmons's house 2 miles west to summit of The Horn, thence west over rolling and broken country to station.

Station mark: A bronze triangulation tablet cemented in a limestone rock, 24 by 12 by 12 inches, set flush with surface of ground, under center of the quadripod signal.



[Latitude 43° 55' 02.92". Longitude 106° 50' 14.28".]

To station—	Azimuth.			Back azimuth.			Log. distance. <i>Meters.</i>
	°	'	"	°	'	"	
"E. K." .....	14	59	00.87	194	56	57.59	4.1872892
Cross H .....	198	40	09.80	18	57	02.98	4.6142975
Accident .....	203	06	21.37	23	16	16.05	4.6834349
Pyrite .....	266	01	19.35	86	11	48.00	4.3067164
Sussex .....	303	20	44.01	123	32	14.31	4.4260360

## TISDALE, JOHNSON COUNTY.

Situated on a good natural point about 6 miles southeast of Robert Tisdale's house and 1 mile east of southeast corner of Tisdale's pasture. It can be reached from Buffalo and Casper stage road by following south boundary (a wire fence) of the above-mentioned ranch 10 miles, thence 1 mile east to signal.

Station mark: A bronze triangulation tablet cemented in solid rock.

Reference mark: A cairn 7 feet high; true azimuth from station mark, 274° 24' 30"; distance, 5.2 feet.

[Latitude 43° 26' 20.41". Longitude 106° 31' 27.92".]

To station—	Azimuth.			Back azimuth.			Log. distance. <i>Meters.</i>
	°	'	"	°	'	"	
Shepherd .....	20	27	09.14	200	21	36.11	4.4966656
Broken Horn .....	63	30	45.66	243	18	33.58	4.4285670
Goodwater .....	90	42	12.16	270	27	09.97	4.4699451
"E. K." .....	142	45	01.06	322	30	01.39	4.6829112
Sussex .....	175	40	46.41	355	39	16.77	4.5862861
Rattlesnake .....	328	50	27.52	148	56	47.40	4.3825343

## ALCOVA, NATRONA COUNTY.

A high, flat-topped hill situated about 6 miles (air line) north of Alcova post-office and 3 miles southwest of Gregg's ranch. A quadri-pod signal was erected on highest ground on eastern extremity. Country to south and east broken and without trail. Can best be reached by going to Gregg's ranch and following small creek to summit.

Station mark: An iron bench-mark post set 3 feet in the ground.

[Latitude 42° 38' 46.51". Longitude 106° 46' 15.26'.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Pedro .....	7 56 04.65	187 53 30.24	4.5790943
Reef .....	205 20 03.63	25 26 32.15	4.4820033
Casper .....	252 30 57.49	72 47 35.48	4.5452971
Chalk .....	323 50 30.75	144 02 37.01	4.6202515

## BASIN, NATRONA COUNTY.

Situated on a slight elevation 4 miles (air line) north of Casper and 1,000 feet east of wagon road.

Signal: A sawed lumber quadripod.

Station mark: An iron bench-mark post set 3 feet in ground.

[Latitude 42° 54' 18.38". Longitude 106° 23' 02.56'.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Mesa .....	259 27 48	79 32 15	3.95629
Casper .....	354 22 56	174 23 50	4.26432

## BROKEN HORN, NATRONA COUNTY.

Situated about 7 miles west of crossing of Buffalo and Casper road over south fork of Powder River, on a high point of a ridge bearing north and south, with other points north and south of it having about the same altitude. This ridge is many miles in length and is locally known as the Broken Horn.

Signal: A wooden quadripod 14 feet high erected over center.

Station mark: A rectangular stone 18 by 12 by 12 inches set flush with the ground and covered with cement on which was inscribed "U. S. G. S."

[Latitude 43° 19' 51.32". Longitude 106° 49' 13.69'.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Goodwater .....	155 46 09.07	335 43 19.87	4.1302162
Tisdale .....	243 18 33.58	63 30 45.66	4.4285670
Rattlesnake .....	283 10 48.11	103 29 18.43	4.5741938
Piney .....	307 02 19.00	127 19 48.27	4.6376603
Shepherd .....	322 59 48.81	143 06 26.44	4.3380093

## BROOKS, NATRONA COUNTY.

Situated between 8 and 9 miles southeast of Casper, and 4 miles north of Brook's ranch, and 1,000 feet east of road leading from Casper to this ranch.

Signal: A sawed lumber quadripod.

Station mark: A bronze triangulation tablet cemented in large boulder which is set flush with ground.

[Latitude 42° 48' 10.62". Longitude 106° 08' 38.84".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Sandy .....	184 01 59	4 02 26	4.10676
Mesa .....	140 33 13	320 27 52	4.22634

## CASPER, NATRONA COUNTY.

Situated on highest point of Casper Mountain, about 8 miles (air line) south of Casper, at the head of "C Y" canyon. Can be approached from Casper by following trail up "C Y" canyon to summit, thence one-half mile east. The rocky knob was cleared of timber and a quadripod signal erected on highest point over center of station.

Station mark: A bronze triangulation tablet cemented in solid rock.

[Latitude 42° 44' 25.64". Longitude 106° 21' 43.46".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Chalk .....	11 36 54.80	191 32 26.58	4.6542006
Shirley .....	14 06 07.38	193 58 16.66	4.8175664
Pedro .....	39 05 39.20	218 46 29.84	4.7907208
Alcova .....	72 47 35.48	252 30 57.49	4.5452971
Reef .....	129 44 44.36	309 34 32.90	4.4240529
Shepherd .....	153 23 16.75	333 11 07.64	4.7319880
Piney .....	176 07 34.85	356 06 14.62	4.5960007
Mesa .....	199 35 14.05	19 38 46.75	4.3256552

## CASPER CITY HOSE TOWER, NATRONA COUNTY.

(Not occupied.)

Station mark: Center of tower.

[Latitude 42° 50' 57.5". Longitude 106° 19' 29.2".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Casper Mountain.....	14 10 11	194 08 40	4. 09595
Reef .....	101 46 39	291 34 56	4. 37956

## MESA, NATRONA COUNTY.

On the northwest end of the prominent mesa bearing northwest to southeast and situated 5 miles northeast of Casper and  $2\frac{1}{2}$  miles east of Buffalo and Salt Creek road.

Signal: A sawed lumber quadripod.

Station mark: A bronze triangulation tablet cemented in large granite rock, which was set under center of signal, flush with ground.

[Latitude 42° 55' 11.77". Longitude 106° 16' 30.59".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Casper Mountain.....	19 38 46.75	199 35 14.05	4. 3256552
Reef .....	83 54 14.02	263 40 28.51	4. 4419929
Piney .....	153 22 01.31	333 17 07.52	4. 3370474

## PINEY, NATRONA COUNTY.

On a mesa-like ridge in T. 36 N., R. 80 W., 20 miles north of Casper and 2 miles west of road from Casper to Salt Creek oil wells; it is one-half mile east of a rocky hill covered with pine timber and 5 miles south of spring locally known as "C Y horse ranch."

Station mark: A bronze triangulation tablet cemented in solid rock.

Reference mark: A cairn 5.5 feet high; true azimuth from station mark, 144° 17' 30"; distance, 3.7 feet.

[Latitude 43° 05' 41.00". Longitude 106° 23' 41.29".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Reef .....	38 23 37.29	218 14 44.14	4. 4558186
Shepherd.....	112 24 53.93	292 14 02.96	4. 3666570
Broken Horn.....	127 19 48.27	307 02 19.00	4. 6376603
Rattlesnake.....	186 21 14.30	6 22 13.71	4. 2479154
Mesa.....	333 17 07.52	153 22 01.31	4. 3370474
Casper .....	356 06 14.62	176 07 34.85	4. 5960007

## RATTLESNAKE, NATRONA COUNTY.

Situated on highest point or ridge between Teapot and Castle Creek,  $\frac{1}{2}$  miles west of Casper and Oilcity wagon road and  $\frac{1}{2}$  miles west of "Teapot Rock." It is 8 miles north of spring known as "C Y horse ranch" on wagon road referred to.

Station mark: A bronze triangulation tablet cemented in solid rock.

Reference mark: A cairn 6 feet high; true azimuth from station mark,  $47^{\circ} 46' 14''$ ; distance, 4.8 feet.

[Latitude  $43^{\circ} 15' 10.96''$ . Longitude  $106^{\circ} 22' 14.47''$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Piney .....	6 22 13.71	186 21 14.30	4.2749154
Shepherd.....	69 37 56.74	249 26 05.36	4.3984782
Broken Horn .....	103 29 18.43	283 10 48.11	4.5741938
Tisdale.....	148 56 47.40	328 50 27.52	4.3825343

## REEF, NATRONA COUNTY.

On highest point of a ridge bearing northwest and southeast, locally known as "The Reefs," about 14 miles west-northwest of Casper and 3 miles south of Casper and Lander stage road.

Signal: A sawed lumber quadripod.

Station mark: An iron bench-mark post set 3 feet in the ground.

[Latitude  $42^{\circ} 53' 34.77''$ . Longitude  $106^{\circ} 36' 43.12''$ .]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Pedro .....	15 45 59.12	195 36 57.05	4.8293235
Alcova .....	25 26 32.15	205 20 03.63	4.4820033
Shepherd.....	172 59 00.62	352 57 04.44	4.4980832
Piney .....	218 14 44.14	38 23 37.29	4.4558186
Mesa .....	263 40 28.51	83 54 14.02	4.4419929
Casper .....	309 34 32.90	129 44 44.36	4.4240529

## SANDY, NATRONA COUNTY.

A secondary station on the highest sand hill about 10 miles east-northeast of Casper and  $\frac{1}{2}$  miles north of Platte River.

Station mark: A hole drilled 1 inch deep in a quartzite rock set flush with surface of ground.

[Latitude 42° 55' 03.98". Longitude 106° 07' 59.10".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Brooks .....	4 02 26	184 01 59	4. 10676
Casper .....	43 37 23	223 28 03	4. 43418
Mesa .....	91 14 16	271 08 28	4. 06451

SHEPHERD, NATRONA COUNTY.

Situated on a high knob on a divide between the waters of Casper Creek and the south fork of Powder River, 4 miles west of road from Casper to Buffalo and 5 miles northwest of Hemingway's road ranch.

Station mark: A bronze triangulation tablet cemented in solid rock.

Reference mark: A cairn 6 feet high; true azimuth from station mark, 85° 55' 56"; distance, 4.4 feet.

[Latitude 43° 10' 27.34". Longitude 106° 39' 33.40".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Broken Horn .....	143 06 26. 44	322 59 48. 81	4. 3380093
Tisdale .....	200 21 36. 11	20 27 09. 14	4. 4966656
Rattlesnake .....	249 26 05. 36	69 37 56. 74	4. 3984782
Piney .....	292 14 02. 96	112 24 53. 93	4. 3666570
Casper Mountain .....	333 11 07. 64	153 23 16. 75	4. 7319880
Reef .....	352 57 04. 44	172 59 00. 62	4. 4980832

# INDEX.

A.	Page.		Page.
Accident station, Wyo., description and position of .....	303	Arkadelphia, Ala., positions near .....	19
Adamsville, Ala., position of .....	20	Armstrong, Ga., position of .....	26
positions between Ensley and .....	20	Arthur, N. Y., position of .....	78
Adamsville, Pa., position of .....	139	positions between South Albion and .....	78
Admiral, Md., position of .....	57	Arundel, Md., position of .....	57
Adner, Va., position of .....	145	Ash station, Mont., description and position of .....	233
Adobe ranch, Cal., position of .....	203	Ashfield station, Mont., description and position of .....	233
Airhill, Ohio, position of .....	103	Ashland, Md., position of .....	54
Ajax station, Ariz., description and position of .....	165	Ashtabula Creek, Pa., position on .....	138
Alabama, traverse, primary, in .....	18-24	Ashton, Md., position of .....	58
Alcony, Ohio, position of .....	110	Atanum station, Wash., description and position of .....	294
Alcova station, Wyo., description and position of .....	307-308	Atchison, Topeka and Santa Fe Railway, positions along .....	32-33, 35-36
Alden, N. Y., position of .....	74	Atglen, Pa., position of .....	133
Alert, Pa., position of .....	132	positions between Oxford and .....	134
Alexander, N. Y., position of .....	75	between Thorndale and .....	133
Alleghenyville, Pa., position 1 mile south-east of .....	132	Atlantic, Pa., position of .....	139
Allen triangulation station, Va., position of .....	145	Attica, N. Y., position 1 mile east of .....	75
Alpine station, Colo., description and position of .....	212	Attica Center, N. Y., position three-fourths of a mile west of .....	75
Alton, Ohio, position of .....	102	Austinburg, Ohio, position of .....	94
Amboy, N. Y., position of .....	80	Avalon, Md., position of .....	57
Amboy Center, N. Y., position near .....	80	Avenel, Md., position of .....	58
American Corners, Md., position of .....	56	Avenstoke, Kv., position of .....	41
Amity, Ga., position of .....	27	positions between Williamstown and .....	41-44
Anchor, Va., position of .....	146	Avondale, Ala., position of .....	21
Anchor station, Utah, description and position of .....	265	Avondale, Pa., position of .....	134
Anderson Creek, Ky., position near .....	50	positions between Oxford and .....	134
Andersontown, Md., position of .....	56	between Pennsylvania-Delaware State line and .....	135
Annapolis, Md., position of .....	59	Ayres, Ala., position of .....	22
positions between Odenton and .....	59		
Annapolis Junction, Md., position of .....	57	B.	
positions between Ellicott City and .....	57	Bachman, Ohio, position of .....	104
between Odenton and .....	57	positions between Greenville and .....	104
Annapolis, Washington and Baltimore Railroad, positions along .....	57, 59	Badger station, Wash., description and position of .....	268-269
Ansonia, Ohio, position of .....	104	Bains, La., position of .....	51
Antelope school, Cal., position of .....	203	Baird station, Wash., description and position of .....	269
Anthony, Ga., position of .....	27	Baker, La., position of .....	52
Anthony's Mills, Md., position of .....	55	Bakersfield station, Cal., description and position of .....	198
Apache station, Ariz., description and position of .....	177-178	Bakerstown station, Pa., description and position of .....	125-126
Arbuckle, Cal., position of .....	202, 206	Bald Mountain, Ariz., position of .....	192
positions between Colusa and .....	206	Bald station, Utah, description and position of .....	265
between "Four Corners" and .....	203	Baldwin, D. H., work of .....	125, 139, 147
Arcanum, Ohio, position of .....	104, 122	Baldwin, H. L., jr., work of .....	189, 207, 215, 216
Arizona, triangulation stations in, descriptions and positions of ..	165-193	Baldy station, Ariz., description and position of .....	174-175
triangulation, secondary, stations in, descriptions and positions of ..	193-197		

	Page.		Page
Baldy station, Oreg., description and position of .....	247-248	Bisbee West station, Ariz., description and position of .....	193
Balis station, W. Va., description and position of .....	147-148	Bismarck, Mo., position of .....	68
Baltimore, Ohio, position of .....	108	positions between Delassus and .....	68
Baltimore and Ohio Railroad, positions along .....	57	Black station, Ariz., description and position of .....	173-174
Baltimore and Ohio Southwestern Railroad, positions along .....	30, 123, 124	Black Butte station, Wash., description and position of .....	270
Bangor, Ala., position of .....	18	Black Creek, Ala., position of .....	24
positions between Birmingham and .....	23-24	Blacks, Cal., position of .....	202
Bannon, T. M., work of .....	165	Blackwater Creek, Va., position on .....	146
Baradees, Ohio, position of .....	105	Bladensburg, Md., tollgate No. 2 at, position of .....	58
Barco, Ill., position of .....	64	Blake Knob station, W. Va., description and position of .....	152
Barnett, Ga., position of .....	26	Blanchester, Ohio, position of .....	123
positions between Crawfordville and .....	26	Blanchet, Ky., position of .....	38
between Washington and .....	26	Bloomsdale, Mo., position of .....	69
Bartley, Ill., position of .....	30	Blount Springs, Ala., position of .....	23
Basin station, Wyo., description and position of .....	308	position 6 miles from .....	18
Bass station, Ariz., description and position of .....	178	Bluff station, Wash., description and position of .....	270
Bassett Butte station, Tex., description and position of .....	263	Blythe station, Wash., description and position of .....	270-271
Baton Rouge, La., position of .....	52	Bobs, Va., position of .....	147
positions between Comite and .....	52	Bolton, Kans., position of .....	36
between Norwood and .....	52	Bonanza station, Utah, description and position of .....	267
Beale station, Cal., description and position of .....	198	Booker City, Ala., position of .....	20
Beartown triangulation station, Pa., position of .....	132	Boquillas station, Tex., description and position of .....	256
Beaver station, Mont., description and position of .....	233-234	Boulder Pass station, Ariz., description and position of .....	190
Beaver Creek schoolhouse, Ohio, positions near .....	109	Boundary monument No. 91 station, Ariz., description and position of .....	193-194
Beaverdam Junction, Wis., position of .....	161	Boundary monument No. 93 station, Ariz., description and position of .....	194
Beckersville, Pa., position of .....	132	Boundary post No. 318 station, Mont., description and position of .....	217
Belfast station, N. Y., description and position of .....	72	Bourkes Corners, Md., position of .....	53
Belgrade, Mo., position of .....	71	Bowie, Md., position of .....	57, 58
Belknap station, Mont., description and position of .....	216	positions between Odenton and .....	57
Benedict station, Ariz., description and position of .....	175	Bowmansville, Pa., position 3 miles north-east of .....	132
Benson, Ky., position of .....	44	Box Elder station, Mont., description and position of .....	217
Bergen station, Colo., description and position of .....	210	Boyces Mills, Md., position of .....	55
Bernhards, N. Y., position of .....	79	Boyles, Ala., position of .....	24
Berryman, Va., position of .....	146	Bradford Hills, Pa., position of .....	137
Big Black Creek, Ala., position on .....	21	Branch, Ky., position of .....	46
Big Christmas station, Tex., description and position of .....	255	Branchville, Md., position of .....	58
"Big Four" Railway, positions along .....	102, 103, 112, 122	Brandywine Creek, Pa., position on .....	133
Big Sandy station, Mont., description and position of .....	216	Brazil station, Mont., description and position of .....	234
Big Sucker Brook, N. Y., position on .....	83	Breck, Ky., position of .....	43
Big Woods, Ohio, position of .....	109	Breckinridge station, Cal., description and position of .....	198
Bigelow station, N. Y., description and position of .....	140	Breda, Ky., position of .....	46
Birdsboro, Pa., position of .....	133	Bremen, Ala., position of .....	19
Birmingham, Ala., position of .....	20, 24	Brierhill, N. Y., position of .....	81
positions between Bangor and .....	23-24	Brighton station, Utah, description and position of .....	264
between Leeds and .....	21	Brinklow, Md., position of .....	58
Birmingham Mineral Railway, positions along .....	22	Broken Horn station, Wyo., description and position of .....	308
		Brooks, Ohio, position of .....	102



Page.		Page.
309	Brooks station, Wyo., description and position of .....	250
103	Brookville, Ohio, position of .....	51
51	Brothers, La., position of .....	179
30	Broughton, Ill., position of .....	118
58	Browns Corners, Md., position of .....	77
303-304	Buffalo station, Wyo., description and position of .....	106
234	Buggy station, Mont., description and position of .....	175
291	Bunch Grass station, Wash., description and position of .....	85
202	Bunks Slough, Cal., position of .....	77
140	Burlington station, Vt., description and position of .....	131
218	Burnham station, Mont., description and position of .....	132
248	Burns station, Oreg., description and position of .....	120
58	Burnt Mills, Md., position of .....	105
66	Bushberg, Mo., position of .....	194-195
205	Butte City, Cal., position between Williams and .....	77.79
206	position $1\frac{1}{2}$ miles west of .....	79
119	Byron, Ohio, position of .....	77
	C.	
67	Cadet, Mo., position near .....	209
22	Cahaba, Ala., position of .....	218
21	Cahaba River, Ala., position on .....	298
132	Cains, Pa., position of .....	84
67, 71	Caledonia, Mo., position of .....	180
201-206	California, traverse, primary in .....	216
197-201	triangulation stations in, descriptions and positions of .....	101
194	Calumet and Arizona flag station, Ariz., description and position of .....	112
180-181	Camanche station, Ariz., description and position of .....	84
79	Camden, N. Y., position of .....	97
79	positions between Cleveland and .....	292
80	between South Albion and .....	22, 23
59	Camp Parole, Md., position of .....	22
132	Campass, Pa., position of .....	23
204	Cana, Cal., position of .....	37
178-179	Cane station, Ariz., description and position of .....	33
31, 32, 37	Caney, Kans., position of .....	234-235
32	positions between Coffeyville and .....	99
49	Caney Creek, Ky., position on .....	100
82	Canton, N. Y., position of .....	56
82	positions between Woodbridge Corners and .....	163
256	Canyon flag station, Tex., description and position of .....	161, 162, 164
179	Cardenas station, Ariz., description and position of .....	116
146	Carsley, Va., position of .....	204
107	Carthage, Ohio, position of .....	204
54	Carvell, Md., position of .....	204
300	Casper station, Wyo., description and position of .....	207-208
309-310	Casper City station, Wyo., description and position of .....	218
89	Casselton, N. Dak., position of .....	219
	Castle Rock station, Oreg., description and position of .....	219
	Catalpa, La., position of .....	219
	Catacart station, Ariz., description and position of .....	219
	Catawba, Ohio, position of .....	219
	Caughdenoy, N. Y., position of .....	219
	Cavett, Ohio, position of .....	219
	Cayetano station, Ariz., description and position of .....	219
	Cayuga, N. Dak., position of .....	219
	Cazanova Creek, N. Y., position on .....	219
	Cedar Knoll, Ohio, position of .....	219
	Cedar Lane, Pa., position of .....	219
	Cedarville, Ohio, position of .....	219
	Celina, Ohio, position of .....	219
	Center flag station, Ariz., description and position of .....	219
	Central Square, N. Y., position of .....	219
	positions between Constantia and .....	219
	between Pennellville and .....	219
	Central station, Colo., description and position of .....	219
	Chain station, Mont., description and position of .....	219
	Chalk Hill station, Wyo., description and position of .....	219
	Chamberlains, N. Y., position of .....	219
	Chapin station, Ariz., description and position of .....	219
	Chapman, Pearson, work of .....	219
	Chardon, Ohio, position of .....	219
	Charles, Ohio, position of .....	219
	Chases Mills, N. Y., position of .....	219
	Chatham Center, Ohio, position of .....	219
	Chelan station, Wash., description and position of .....	219
	Chepultepec, Ala., position of .....	219
	positions between Palmer and .....	219
	between Warnock Knob and .....	219
	Cherokee Strip, Kans., position of .....	219
	Cherryvale, Kans., position of .....	219
	Chester station, Mont., description and position of .....	219
	Chester triangulation station, Ohio, position of .....	219
	Chesterland, Ohio, position of .....	219
	Chestnut Grove, Md., position of .....	219
	Chicago and Northwestern Railway, positions along .....	219
	Chicago, Milwaukee and St. Paul Railway, positions along .....	219
	Chickasaw, Ohio, position of .....	219
	Chico, Cal., position of .....	219
	positions between Orland and .....	219
	between Tehama and .....	219
	Chief station, Colo., description and position of .....	219
	Chinook station, Mont., description and position of .....	219
	Chinook Schoolhouse station, Mont., description and position of .....	219
	Chisos station, Tex., description and position of .....	219
	Chittenden, Ohio, position of .....	219

	Page.		Page
Christy station, Pa., description and position of .....	126	Cone station, Mont., description and position of .....	219
Church Hill, Md., position of .....	54	Conestoga Creek, Pa., position on .....	132
Cincinnati, New Orleans and Texas Pacific Railway, positions along .....	37-39	Conneautville, Pa., position of .....	138
Cincinnati Northern Railroad, positions along .....	104-106	Constantia, N. Y., position of .....	78
Claremont, Va., position of .....	145	positions between Central Square and .....	79
Clarence, N. Y., position of .....	76	between Cleveland and .....	79
Claridon triangulation station, Ohio, position of .....	100	between South Albion and .....	78
Clarks Knob station, W. Va., description and position of .....	151	Cooper station, Wash., description and position of .....	292
Clarksville, Ohio, position of .....	125	Coopers Falls, N. Y., position of .....	83
Clearview station, Pa., description and position of .....	129	Corinth, Ky., position of .....	38, 41
Clegg, Ky., position of .....	43	Cornelian, Ohio, position of .....	96
Cleopatra, Ky., position of .....	47	Corning, Cal., position of .....	203
Cleveland, N. Y., position of .....	79	Costello, Kans., position of .....	35
positions between Camden and .....	79	Coulee station, Wash., description and position of .....	272
between Constantia and .....	79	Coulee City station, Wash., description and position of .....	272
Clifford, N. Dak., position of .....	91	Crab station, Wash., description and position of .....	267-268
Cloverly, Md., position of .....	58	Craborchard Creek, Ky., position on .....	49
Clyman, Wis., position of .....	163	Crane, Kans., position of .....	35
positions between Minnesota Junction and .....	163	Crawfordville, Ga., position of .....	25, 26
Coal station, Wash., description and position of .....	294-295	positions between Barnett and .....	26
Coaltown, Ohio, position of .....	112	between Rose Hill triangulation station and .....	25
Coatesville, Pa., position of .....	133	Cream, Pa., position of .....	134
Coburg station, Mont., description and position of .....	219	Creighton, Ohio, position of .....	107
Coconino station, Ariz., description and position of .....	180	Creve Cœur, Mo., position of .....	62
Coffeyville, Kans., position of .....	32	Crittenden, N. Y., position of .....	74
positions between Caney and .....	32	Cross H station, Wyo., description and position of .....	304
between Thayer and .....	32-33	Croton Peak station, Tex., description and position of .....	257
Coldwater, Ohio, position of .....	105, 116	Crow station, Oreg., description and position of .....	248-249
Colebrook, Ohio, position of .....	96	Crownsville, Md., position of .....	59
Colesville, Md., position of .....	58	Cunningham, Ala., position of .....	24
Colfax, N. Dak., position of .....	87		D.
Colorado, Hinsdale County, triangulation station No. 5, description and position of .....	213	Dale, Ill., position of .....	30
triangulation stations in, description of .....	207-215	Davis station, N. Y., description and position of .....	72
Columbia station, Wash., description and position of .....	271	Dayton, Md., position of .....	59
Columbus, Ohio, positions between London and point 5 miles northwest of .....	102	Dayton, Ohio, position of .....	103-109
Columbus, Wis., position of .....	162	positions between Dodson and .....	103
positions between Reesville and .....	162	between Osborn and .....	103
Colusa, Cal., position of .....	206	Dayton and Union Railroad, positions along .....	104
positions between Arbuckle and .....	206	Deer Creek, Ky., position on .....	48
between Colusa Junction and .....	206	Deer Creek, Ohio, position on .....	106
Colusa Junction, Cal., position of .....	202, 206	Deering, Kans., position of .....	32
positions between Colusa and .....	206	Dekalb, N. Y., position of .....	82
Comite, La., position of .....	52	positions between Edwardsville and .....	81-82
positions between Baton Rouge and .....	52	between Jinks triangulation station and .....	83
Comstock, Minn., position of .....	89	Del Paso station, Ariz., description and position of .....	190
Comstock station, Ariz., description and position of .....	166	Delassus, Mo., position of .....	68
Concord, Md., position of .....	56	positions between Bismarck and .....	68
Concord, Ohio, position of .....	101	Delaware, Ky., position near .....	47
Concord Center, Ohio, position of .....	101	Delisle, Ohio, position of .....	104
		Democrat station, Colo., description and position of .....	208

	Page.		Page.
Dendron, Va., position near .....	146	"E. K." station, Wyo., description and position of .....	304-305
Depeyster, N. Y., position of .....	81	Elberton, Ga., position near .....	28
Depeyertown, N. Y., position of .....	82	Eldorado, Ill., position of .....	30
Des Peres, Mo., position of .....	62	Elizabeth station, W. Va., description and position of .....	156
Desert station, Ariz., description and position of .....	181	Elk City, Kans., position of .....	37
Detroit Southern Railroad, positions along .....	124	positions between Fredonia and .....	35
Devault, Pa., position of .....	137	between Havana and .....	35-36
Dewey station, Wash., description and position of .....	272-273	Elk station, Wyo., description and position of .....	298-299
Dodson, Ohio, position of .....	103	Elk Chester, Ky., position of .....	39
positions between Dayton and .....	103	Elkhorn, Ky., position of .....	44
Dodson station, Mont., description and position of .....	219	Elkridge, Md., position of .....	57
Doe Run Junction, Mo., position of .....	68	Elkview, Pa., position of .....	134
Don Luis station, Ariz., description and position of .....	195	Ella, Wis., position of .....	162
Donerail, Ky., position of .....	39	Ellicott City, Md., positions between Annapolis Junction and .....	57
Dorlan flag station, Pa., position of .....	135	Elliott station, Ariz., description and position of .....	181-182
positions between Downingtown and .....	135	Ellis, J. R., work of .....	28,
Dorset, Ohio, position of .....	94	37, 45, 47, 60, 65, 70, 101, 107, 112, 122	
Dorsey, Md., position of .....	57	Elmwood, Ky., position of .....	48
Douglas, E. M., work in charge of .....	165-312	positions between Slaughterville and .....	48
Douglas station, Colo., description and position of .....	209	Emma, Ill., position of .....	28
Douglasville, Pa., position of .....	136	Empire station, Ariz., description and position of .....	167
Dowlin flag station, Pa., position of .....	135	Enon, Ohio, position of .....	103
Downingtown, Pa., position of .....	181, 135	Ensley, Ala., position of .....	20
positions between Dorlan flag station and .....	135	positions between Adamsville and .....	20
Dry Creek station, Oreg., description and position of .....	250-251	between Pratt City and .....	20
Dryer triangulation station, Ill., position of .....	65	Ep, Ky., position of .....	43
Dugway, N. Y., position of .....	78	Equality, Ill., position of .....	30
Dun, Va., position of .....	146	Erie, N. Dak., position of .....	91
Dunnigan, Cal., position of .....	202	Erie Railway, positions along .....	103
Dupo, Ill., position of .....	65	Essex Center church station, Vt., description and position of .....	141
Durbin, Ohio, position of .....	103	Essex Junction church station, Vt., description and position of .....	141
Duvall, Ky., position of .....	45	Establishment Creek, Mo., position near .....	69
Dyer station, Wash., description and position of .....	273	Ethel, La., position of .....	52
E.		Eureka station, Mont., description and position of .....	221
East Aurora, N. Y., position of .....	77	Euterpe, Ky., position of .....	47
East Belknap station, Mont., description and position of .....	220	F.	
East Base station, Mont., description and position of .....	220	Faggan station, Ariz., description and position of .....	167
East Cherry station, Mont., description and position of .....	220-221	Fairview, Pa., position of .....	136
East Claridon, Ohio, position of .....	100	Fargo, N. Dak., position 2½ miles northwest of .....	93
East Dayton, Ohio, position of .....	109	positions between point 7 miles north of Hillsboro and .....	93
East Downingtown, Pa., position of .....	135	between Warren and .....	87
East Pembroke, N. Y., position of .....	75	between Wheatland and .....	89
East Pottstown, Pa., position of .....	136	Farmers, Ohio, position of .....	123
East St. Louis, Ill., position of .....	64	Farmington, Mo., position of .....	68, 70
Eaton, Ohio, position of .....	121	Farmington Junction, Mo., position of .....	70
Ebenezer, Ohio, position of .....	121	Fenton, Mo., position of .....	63
positions Ohio-Indiana State line and .....	122	Fernwood, N. Y., position of .....	78
Eden, Mo., position of .....	61	Festus, Mo., position of .....	66
Ednor, Md., position of .....	58	Fields station, Oreg., description and position of .....	245
Edwardsville, N. Y., position of .....	81	Fifteenmile station, Mont., description and position of .....	221
positions between Dekalb and .....	81-82		

	Page.		Page.
Final station, Ariz., description and position of.....	182	Gardners Mills, Ala., position of.....	24
Finlay station, W. Va., description and position of.....	151	Garnes station, W. Va., description and position of.....	148-149
Fishing Creek, Ga., position on.....	27	Gayden, La., position of.....	52
Flatwoods Academy, Ga., position of.....	25	Geneseo, N. Dak., position of.....	85
Flenners Corners, Ohio, position of.....	107	Geneva, Cal., position of.....	202
Flockton, Ohio, position of.....	107	Geneva, Pa., position of.....	138
Floyd, Mo., position of.....	71	Georgetown, Ky., position of.....	38, 39
position between Undine and.....	71	positions between Hatton and.....	44-45
Floyd station, Ariz., description and position of.....	182-183	Georgia, traverse, primary, in.....	24-28
Flynn station, Wash., description and position of.....	273-274	Georgia Railroad, positions along.....	26
Fogerty station, Mont., description and position of.....	222	Germany, Ohio, position of.....	108
Forder triangulation station, Mo., position of.....	63	Gettysburg, Ohio, position of.....	111
Forks station, Mont., description and position of.....	222	Gibraltar, Pa., position 4½ miles from.....	132
Fort Assiniboine station, Mont., description and position of.....	222	Giddings, Ohio, position of.....	97
Fort Belknap station, Mont., description and position of.....	223	Gilbert, Ohio, position of.....	105
Fort Ethan Allen station, Vt., description and position of.....	141	Gillivan, Ohio, position of.....	106
Fossil station, Ariz., description and position of.....	183	Gilton camp grounds, Md., position of...	55
Foster Chapel station, W. Va., description and position of.....	148	Gladstone, Ohio, position of.....	118, 120
"Four Corners," Cal., position of.....	205	Glasgow station, Mont., description and position of.....	235
positions between Arbutle and.....	206	Glen Lock, Pa., position of.....	137
between Jacinto and.....	205	Glendale, Ky., position of.....	99
Fourche a Du Close Creek, Mo., position of, at junction with Goose Creek.....	69	Glenelg, Md., position of.....	59
Fowlers Mill, Ohio, position of.....	100	Glenville, Ky., position of.....	47
positions between Painesville and point 1 mile east of.....	101	Gloucester, Va., position of.....	144
Francis Mills, Ill., position of.....	30	Gloucester Point, Va., position of.....	144
Frankfort, Ky., position of.....	44	Goff station, W. Va., description and position of.....	159
Frankfort and Cincinnati Railway, positions along.....	44-45	Goodville, Pa., position of.....	132
Fredonia, Kans., positions between Elk City and.....	35	Goodwater station, Wyo., description and position of.....	305
positions between Neodesha and.....	34	Goose Creek, Mo., position of, at junction with Fourche a Du Close Creek.....	69
Free Union, Ky., position of.....	49	Goose River, N. Dak., position near.....	93
Freed station, W. Va., description and position of.....	158	Gordon, Ohio, position of.....	104
French Village, Mo., position of.....	69	Gordon station, N. Y., description and position of.....	73
Frenchman station, Wash., description and position of.....	274	Gormantown, Cal., position of.....	202
Frenchtown, Ohio, position of.....	111	Goshen, Ga., position of.....	27
Fresno station, Tex., description and position of.....	263-264	Gould, Ohio, position of.....	97
Furnace Run, Ohio, position on.....	98	Grafton, Ohio, position of.....	98
G.			
Gable station, Wash., description and position of.....	296	Graftonburg, Ky., position of.....	41
Galilee, N. Y., position of.....	81	Grand River, Ohio, position on.....	95
Gambrells, Md., position of.....	59	Grandin, N. Dak., position of.....	93
Gannett, S. S., work of.....	147	Granite City, Ill., position of.....	64, 65
Garden City, Ala., position 4 miles from.....	18	Grass River, N. Y., position on.....	82
Gardenville, N. Y., position of.....	67	Grass station, Oreg., description and position of.....	251
Gardner, N. Dak., position of.....	93	Grasse Point, Ohio, position of.....	117
		Graz, Ky., position of.....	42, 43
		Grayson, Ohio, position of.....	110
		Grayville, Ala., position of.....	20
		Great Northern Railroad, positions along.....	85, 87, 88-89, 90-91, 93
		Green, N. Dak., position of.....	89
		Green station, Wash., description and position of.....	275
		Greensboro, Md., position of.....	55
		Greenups, Ky., position of.....	43
		Greenville, Ohio, position of.....	104
		positions between Bachman and.....	104
		between Haviland and.....	104-106
		Grindal station, Colo., description and position of.....	208

Page.		Page.
61	Grosse Point, Mich., position of .....	Hollenbeck station, Ariz., description and position of .....
42	Grug Ridge, Ky., position of .....	183-184
40	Gudgel, Ky., position of .....	Holmes station, Vt., description and position of .....
47	Guffy, Ky., position of .....	142
124	Gurneyville, Ohio, position of .....	Honaker station, W. Va., description and position of .....
275	Gaske station, Wash., description and position of .....	153
131	Guthrieville, Ohio, position of .....	Hope, Md., position of .....
	H.	54
61	Halfway House, Mich., position of .....	Hopewell Furnace, Pa., position of .....
19	Hanby Mills, Ala., position of .....	136
85	Hankinson, N. Dak., position of .....	Hopkins station, Ariz., description and position of .....
85	positions between Lidgerwood and .....	168
57	Hanover, Md., position of .....	Horace, N. Dak., position of .....
	Harlem station, Mont., description and position of .....	87
223		Horseshoe Lake, Ill., position of .....
94	Harpersfield Center, Ohio, position of .....	64
46	Harrison, Ky., position of .....	House, Kans., position of .....
95	Hartgrove, Ohio, position of .....	35
53	Hartley, Md., position of .....	Howardville, N. Y., position of .....
107	Hartwell, Ohio, position of .....	78
103	Hashman, Ohio, position of .....	Hudson, Ohio, position of .....
41, 42	Hatton, Ky., position of .....	99
44-45	positions between Georgetown and .....	Hughes siding, Ala., position of .....
36	Havana, Kans., position of .....	24
35-36	positions between Elk City and .....	Huguenot, Ga., position of .....
106	Haviland, Ohio, position of .....	28
104-106	positions between Greenville and .....	Hume, Ohio, position of .....
223	Havre station, Mont., description and position of .....	112
31,	Hawkins, G. T., work of .....	Hunter station, Oreg., description and position of .....
61, 63, 87, 90, 101, 108, 109, 119, 120, 122, 161		251-252
134	Hayesville, Pa., position 1 mile west of .....	Huntsburg, Ohio, position 2 miles south of .....
44	Heekin, Ky., position of .....	100
257-258	Hen Egg Mountain station, Tex., description and position of .....	I.
47	Henderson, Ky., position of .....	Idaho, triangulation station in, description of .....
47	positions between Utica and .....	255
152	Henderson station, W. Va., description and position of .....	Ilchester, Md., position of .....
21	Henryellen, Ala., position of .....	57
50	Herman, Ky., position of .....	Illinois, traverse, primary, in .....
43	Hester, Ky., position of .....	29-31, 63-65
126-127	Heverline station, Pa., description and position of .....	traverse, primary, in Indiana and .....
124	Hickoryville, Ohio, position of .....	28-29
235	Hicks station, Mont., description and position of .....	Illinois Central Railroad, positions along .....
50	Highland, Ky., position of .....	45, 49
276	Hill station, Wash., description and position of .....	Independence, Kans., position of .....
276	Hill House station, Wash., description and position of .....	36
26	Hillman, Ga., position of .....	Indian station, Pa., description and position of .....
93	Hillsboro, N. Dak., position of .....	127
93	positions between Fargo and a point 7 miles north of .....	Indiana, traverse, primary, in, Illinois and .....
98	Hinckley, Ohio, position of .....	28-29
236	Hinsdale station, Mont., description and position of .....	Inglehart, Md., position of .....
38	Hinton, Ky., position of .....	59
39	Hittenyer, Ky., position of .....	Iona, Ohio position of .....
55	Hobbs, Md., position of .....	95
235	Hog Ranch station, Wash., description and position of .....	positions between Mesopotamia triangulation station and .....
		95
		Irondale, Ala., position of .....
		21
		Ironside station, Oreg., description and position of .....
		252
		J.
		Jacinto, Cal., position of .....
		205
		positions between "Four Corners" and .....
		205
		between Willows and .....
		205
		Jackson station, Wash., description and position of .....
		276-277
		Jacksonburg, Ohio, position of .....
		114
		Jacksonville, Ky., position of .....
		42
		Jamestown, N. Dak., position between Hankinson triangulation station and .....
		85
		Jaydee, Mo., position of .....
		70
		Jayesville, Ohio, position of .....
		104
		Jefferson, Ohio, position of .....
		94, 96
		positions between eighty-first meridian and .....
		94
		between Leon and .....
		94
		between Ohio-Pa. State line and .....
		97
		between parallel 41° 30' and .....
		96
		Jelm station, Wyo., description and position of .....
		238

Page.	Page.		
Jephany station, W. Va., description and position of .....	156	Laura, Ohio, position of .....	108
Jessups, Md., position of .....	57	Laurel Hill, La., position of .....	51
Jewetta station, Cal., description and position of .....	199	positions between St. Francisville and .....	51
Jinks triangulation station, N. Y., position of .....	33	Lawrence, N. Y., position of .....	83
position between Dekalb and .....	33	Lawrenceburg, Ky., position of .....	39, 40
Jividen station, W. Va., description and position of .....	153	positions between Lexington and .....	39-40
Johnson, Ky., position of .....	45	Lawreton, Mo., position of .....	69
Johnson station, Wash., description and position of .....	289-290	Lawrenceville, Ky., position of .....	43
Johnson No. 3 station, Ariz., description and position of .....	195	Lawrenceville, Ohio, position of .....	119
Jonca Creek, Mo., position on .....	68	Leeds, Ala., position of .....	21
Jones, Oscar, work of .....	18	positions between Birmingham and .....	21
Jones, Ohio, position of .....	107	Legault station, Colo., description and position of .....	210
Jopps Corners, Md., position of .....	55	Lehman flag station, Ala., position of .....	24
Juneau, Wis., position of .....	163	Lenover, Pa., position of .....	133
K.		Lenox, Ohio, position of .....	96
Kansas, traverse, primary, in .....	31-37	Leon, Ohio, position of .....	94
Kansas City, Memphis and Birmingham Railroad, positions along .....	20	positions between Jefferson and .....	94
Keane station, Wash., description and position of .....	277	Lewis station, Wash., description and position of .....	277-278
Kellogg station, Ariz., description and position of .....	168	Lexington, Ky., position of .....	29
Kelton, Pa., position of .....	134	positions between Lawrenceburg and .....	39-40
Kemp, Ohio, position of .....	112	between Williamstown and .....	37-39
Kendall, C. B., work of .....	53, 55, 56, 94, 97, 99, 133, 137, 143, 145	Liberty, Kans., position of .....	33
Kendrick station, Ariz., description and position of .....	184	Liberty, Ohio, position of .....	119
Kennard station, W. Va., description and position of .....	151-152	Liberty schoolhouse, Cal., position of .....	202
Kennebec, Ky., position of .....	44	positions between northwest Yolo base triangulation station and .....	202
Kennedy, Ky., position of .....	50	between Red Bluff and .....	202-203
Kentucky, traverse, primary, in .....	37-50	Lidgerwood, N. Dak., position of .....	85
Keyser, Wis., position of .....	163	positions between Hankinson and .....	85
Kimberly, Ala., position of .....	23	between Rutland and .....	85
Kings Corners, N. Y., position of .....	81	Lime station, Ariz., description and position of .....	196
Kingston station, Colo., description and position of .....	209-210	Limerick, Pa., position of .....	136
Kinkaid, Ky., position of .....	38	Lincoln University, Pa., position of .....	134
Kirkwood, Cal., position of .....	203	Lincolnton, Ga., position of .....	27
Klocks, Ohio, position of .....	123	positions between Lisbon and .....	27
Kokomo, N. Y., position of .....	81	between Wrightsboro and .....	27
Kuntz station, Wash., description and position of .....	288-289	Linton, Ala., position of .....	23
L.		Lisbon, Ga., position of .....	27
Laffoon, Ky., position of .....	46	positions between Lincolnton and .....	27
Lafontaine, Kans., position of .....	35	between point on line near Rose Hill triangulation station and .....	28
Lake Ontario, N. Y., positions between Pennellville and .....	78	Lisman, Ky., position of .....	49
Lake Shore and Michigan Southern Railway, positions along .....	94	positions between West Vanderburg and .....	49
Lake station, Colo., description and position of .....	213	Litchfield, Ohio, position of .....	97, 98
Lakeview station, Cal., description and position of .....	199	Little Darby Creek, Ohio, position on .....	106
Landenburg, Pa., position of .....	135	Little Rockies (Sullivan Peak) station, Mont., description and position of .....	224
Larb station, Mont., description and position of .....	236-237	Liverpool, Ohio, position of .....	98
		Lockman, Md., position of .....	54
		Lockport, Ky., position of .....	42
		Locust Fork, Ala., position on .....	23
		Lodi, Ohio, position of .....	97
		London, Ohio, position of .....	102
		positions between point 5 miles northwest of Columbus and .....	102
		between Springfield and .....	102
		Lost Creek, Ohio, position on .....	110
		Lost Lake, Wis., position of .....	162
		Lota, Cal., position of .....	204
		Louck, Ala., position of .....	21

Page.	Page.		
Loughboro, Mo., position of .....	68	Maverick Mountain station, Tex., de-	259
Louisiana, traverse, primary, in .....	50-52	scription and position of .....	259
Louisville, N. Y., position of .....	84	Maxwell, Cal., position of .....	202
Louisville and Nashville Railroad, posi-		Mayfield, Ohio, position of .....	99
tions along .....	23-24, 30, 48	Mayville, N. Dak., position of .....	91
Lowe station, N. Y., description and po-		positions between Rolette, Minn., and	92
sition of .....	73	Medicine Bow station, Wyo., descrip-	
Ludlow Falls, Ohio, position of .....	106	tion and position of .....	299
Luzon, Ky., position of .....	49	Meekers, Ohio, position of .....	104
Lynchburg, Ohio, position of .....	123	Mehlville, Mo., position of .....	63
Lyneville, Ga., position of .....	25	Mesa station, Mont., description and	
Lyondale, Cal., position of .....	202	position of .....	224
M.		Mesa station, Wyo., description and po-	
McBeth, J. F., work of .....	212	sition of .....	310
McCune station, Wash., description and		Mesopotamia triangulation station, Ohio,	
position of .....	279	position of .....	95
McDonald station, Wash., description		positions between Iona and .....	95
and position of .....	278	Mexico, N. Y., position of .....	78
McGinnis station, Pa., description and		Michigan, traverse, primary in .....	60-61
position of .....	129	Midway, Ohio, position of .....	119
McGwines, Md., position of .....	54	Mile board 984 station, Mont., descrip-	
McKee station, W. Va., description and		tion and position of .....	224
position of .....	154	Milford, Pa., position 1½ miles northwest	
McKelvey station, Pa., description and		of .....	136
position of .....	127-128	Milford Mills, Pa., position of .....	136
McLaughlin, Fred, work of .....	216	Milk River Bridge station, Mont., de-	
McManamon station, Wash., description		scription and position of .....	225
and position of .....	278-279	Mill Creek, Ohio, position on .....	95
McMann station, Wash., description and		Millersville, Md., position of .....	59
position of .....	279-280	Millet station, Ariz., description and po-	
McManus, La., position of .....	52	sition of .....	184
McNair, E. L., work of .....	24, 50,	Millington, Md., position of .....	53
73, 75, 77, 80, 131, 134, 139, 147		Milltale Creek, Va., position on .....	146
Mad River, Ohio, positions near .....	119	Milner, Ky., position of .....	40
Madison, Ill., position of .....	64	Milnor, N. Dak., position of .....	86
positions between Peters and .....	64	Milton station, Vt., description and po-	
Madrid, N. Y., position of .....	84	sition of .....	143
positions between Massena and .....	84	Mineral Monument No. 2 station, Ariz.,	
Magnolia triangulation station, Mo., po-		description and position of ...	196
sition of .....	69	Mineral Monument No. 3 station, Ariz.,	
Mail Box station, Tex., description and		description and position of ...	196-197
position of .....	258	Mineral Monument No. 6 station, Ariz.,	
Malheur station, Oreg., description and		description and position of ...	166
position of .....	249	Mingo Mills, Pa., position of .....	137
Malta station, Mont., description and po-		Minnesota, traverse, primary, in North	
sition of .....	237	Dakota and .....	87-94
Malton, Cal., position of .....	203	Minnesota Junction, Wis., position of ...	163
Malvern, Pa., position of .....	137	positions between Clyman and .....	163
positions between Woodbine and ...	137	Minnesota Junction triangulation sta-	
Mannie, Ill., position of .....	28	tion, Wis., position of .....	161
Manor, Pa., position 2 miles from .....	131	Mint Spring Branch, Ky., position near ...	43
Maple Creek, Md., position near .....	54	Mississippi River and Bonnetterre Rail-	
Maria Stein, Ohio, position of .....	116	way, positions along .....	66
Mariscal Mountain station, Tex., descrip-		Missouri, traverse, primary in .....	61-63, 65-71
tion and position of .....	258	Missouri Pacific Railway, positions along ...	32,
Marsh, Pa., position of .....	136		35, 62
Martins Corners, Pa., position of .....	131	Missouri Southern Railroad, positions	
Maryland, traverse, primary, in .....	53-59	along .....	68
Maryland siding, La., position of .....	52	Missouri station, Mont., description and	
Mason, Ky., position of .....	37	position of .....	237
Masons Branch, Md., position on .....	54	Mitchell station, Oreg., description and	
Massena, N. Y., position of .....	84	position of .....	252-253
positions between Madrid and .....	84	Money, Va., position of .....	144
Massena Springs, N. Y., position of .....	84	Monocacy, Pa., position of .....	133, 136
		positions between Pottstown and .....	136

	Page.		Page.
Montana, Choteau County, triangulation station No. 318, description and position of .....	217	New York, triangulation stations in Vermont and, descriptions and positions of .....	139-143
triangulation stations in, descriptions and positions of .....	215-244	New York, Ontario and Western Railway, positions along .....	77, 79
Montevideo, Md., position of .....	57	Newcastle, Ala., position of .....	24
Montezuma, Ohio, position of .....	116	Noecreek, Ky., position of .....	46
Monument No. 21 station, Ariz., description and position of .....	176	Nord, Cal., position of .....	204
Moraine station, Mont., description and position of .....	237-238	Norman, Cal., position of .....	202
Morehead, Kans., position of .....	33	Norman, Md., position of .....	54
Morey Ridge, N. Y., position of .....	83	Norrisville, Pa., position of .....	138
Morris, Ala., position of .....	23	North Canyon station, Ariz., description and position of .....	185
Morrison station, Colo., description and position of .....	211	North Christmas station, Tex., description and position of .....	259
Morristown, N. Y., position of .....	81	North Constantia, N. Y., position of .....	78
Morristown Point triangulation station, N. Y., position of .....	81	North Dakota, traverse, primary, in .....	84-87
Moses station, Wash., description and position of .....	293	traverse, primary, in Minnesota and .....	87-94
Mount Carmel Church station, W. Va., description and position of .....	159	North Fork station, Mont., description and position of .....	225
Mount Steele station, Wyo., description and position of .....	299-300	North Newberry, Ohio, position of .....	100
Mount Union station, Ariz., description and position of .....	191	North Sheldon, N. Y., position of .....	74
Moxee station, Wash., description and position of .....	295-296	North Woodland, Ohio, position of .....	99
Mud Lake, N. Y., position of .....	82	Northampton, Ohio, position of .....	119
Munson, Ohio, position of .....	100	Northwest Yolo base triangulation station, Cal., positions between Liberty schoolhouse and .....	202
Murrays Corners, N. Y., position of .....	74	Norwood, La., position of .....	52
positions between Wales Center and between Williamsville and .....	74 76	positions between Baton Rouge and .....	52
between Willow Bend Inn and .....	75	Novi, Mich., position of .....	60
Mustang station, Ariz., description and position of .....	176	Nye, Ga., position of .....	27
Myers, Ohio, position of .....	102	O.	
N.		Oakland, Ohio, position of .....	111, 117
Naco Junction station, Ariz., description and position of .....	197	Oakridge, Ky., position of .....	45
Nashua station, Mont., description and position of .....	238	Octoraro, Pa., position of .....	134
National Chapel, Ohio, position of .....	118	Octoraro Creek, Pa., position on .....	134
Natrona station, Pa., description and position of .....	128	Ogdensburg, N. Y., position of .....	81
Nectar, Ala., position near .....	18	Odenton, Md., position of .....	57
Needle station, Wyo., description and position of .....	300	positions between Annapolis and .....	59
Neiderst, Ind., position of .....	29	between Annapolis Junction and .....	57
Nemo station, Mont., description and position of .....	238	between Bowie and .....	57
Neodesha, Kans., position of .....	34	Ohio, traverse, primary, in .....	94-125
positions between Fredonia and .....	34	Ohio City, Ohio, position of .....	105
New Antioch, Ohio, position of .....	124	Oil station, Cal., description and position of .....	199
New Carlisle, Ohio, position of .....	119	Oldtown, Ohio, position of .....	120
New Madison, Ohio, position of .....	121	Oldtown station, Cal., description and position of .....	200
New Moorefield, Ohio, position of .....	118, 119	Oliver station, Ariz., description and position of .....	185
New Prospect, Ala., position of .....	19	Orange Grove, Md., position of .....	57
New River station, Ariz., description and position of .....	191	Orangeville Center, N. Y., position of .....	74
New Weston, Ohio, position of .....	105	positions between Wales Center and between Willow Bend Inn and .....	74 75
New York, traverse, primary, in .....	73-84	Orauga Hill Church, Ohio, position of .....	99
triangulation stations in, descriptions and positions of .....	72-73	Orchard Park, N. Y., position of .....	78, 77
		positions between Wales Center and between Williamsville and .....	77 76
		Ordinary, Va., position of .....	144
		Oregon, triangulation stations in, descriptions and positions of .....	245-254
		Orland, Cal., position of .....	202, 204
		positions between Chico and .....	204
		Orwell, Ohio, position 1 mile south of .....	95



Page.		Page.
103	Osborn, Ohio, position of .....	45
103	positions between Dayton and .....	45
87	Osgood, N. Dak., position of .....	137
116	Osgood, Ohio, position of .....	
82	Oswegatchie River, N. Y., position on .....	174
45	Owensboro, Ky., position of .....	97
45	positions between Philpot and .....	
253	Owyhee station, Oreg., description and position of .....	226
134	Oxford, Pa., position of .....	280
134	positions between Atglen and .....	
134	between Avondale and .....	
1:2	Oxtobys, Ohio, position of .....	
P.		
147	Pagan Creek, Va., position on .....	
101	Painesville, Ohio, position of .....	
	positions between point 1 mile east of Fowlers Mills and .....	
117	Paint Creek, Ohio, position on .....	
22	Palmer, Ala., position of .....	149
22	positions between Chepultepec and .....	
138	Palmer, Pa., position of .....	118
200	Pampa station, Cal., description and position of .....	102
168	Pantano station, Ariz., description and position of .....	132
46	Fanther Creek, Ky., position on .....	134-155
133	Parkesburg, Pa., position of .....	138
107	Parkplace, Ohio, position of .....	138
61	Pattonville, Mo., position of .....	133
57	Patuxent, Md., position of .....	
39	Paynes, Ky., position of .....	239
144	Peach Hill Run, Va., position on .....	300-301
233-239	Peak station, Mont., description and position of .....	
300-301	Pedro station, Wyo., description and position of .....	
301	Pelham station, Wyo., description and position of .....	
98, 99	Peninsula, Ohio, position of .....	20
77	Pennellville, N. Y., position of .....	20
	positions between Central Square and .....	
77	between Lake Ontario and .....	206
131-139	Pennsylvania, traverse, primary, in .....	203
	triangulation stations in, descriptions and positions of .....	
102, 103, 121, 133, 135, 136, 137	Pennsylvania Railroad, positions along .....	169
135	Pomeroy and Newark Branch, positions along .....	47
225-226	Pepin station, Mont., description and position of .....	189
132	Pequea, Pa., position of .....	
86	Perry, N. Dak., position of .....	305-306
64	Peters, Ill., position of .....	
64	positions between Madison and .....	
95	Phelps Creek, Ohio, position on .....	
57, 134	Philadelphia, Baltimore and Washington Railroad, positions along .....	
189	Phillips station, Ariz., description and position of .....	
143	Philo station, Vt., description and position of .....	
25	Philomath, Ga., position of .....	
45	Philpot, Ky., position of .....	
45	positions between Owensboro and .....	
137	Phoenixville, Pa., position of .....	
174	Picacho station, Ariz., description and position of .....	
97	Pierpont, Ohio, position of .....	
226	Pikes Peak station, Mont., description and position of .....	
280	Pilot station, Wash., description and position of .....	
310	Piney station, Wyo., description and position of .....	
193	Pinnacle, Ariz., position of .....	
160	Pinnacle station, W. Va., description and position of .....	
118	Pitchin, Ohio, position of .....	
108, 110	Pittsburg, Ohio, position of .....	
145	Plain View, Va., position of .....	
66	Plattin, Mo., position of .....	
149	Pleasant Hill Church station, W. Va., description and position of .....	
118	Pleasant Township, Ohio, position of .....	
102	Plattsburg, Ohio, position of .....	
132	Plowville, Pa., position 2 miles north of .....	
134-155	Pollock station, W. Va., description and position of .....	
138	Pomeroy, Pa., position of .....	
239	Porcupine station, Mont., description and position of .....	
57	Portland, Md., position of .....	
91	Portland, N. Dak., positions between Wheatland and .....	
139	Posters Corners, Pa., position of .....	
42	Pot Ripper Creek, Ky., position on .....	
145	Potopotank Creek, Va., position on .....	
67, 70	Potosi, Mo., position of .....	
136	Pottstown, Pa., position of .....	
136	positions between Monocacy and .....	
226	Prairie station, Mont., description and position of .....	
20	Pratt City, Ala., position of .....	
20	position between Ensley and .....	
206	Princeton, Cal., position of .....	
203	Proberta, Cal., position of .....	
169	Pusch station, Ariz., description and position of .....	
47	Puyear, Ky., position of .....	
189	Pyramid station, Ariz., description and position of .....	
305-306	Pyrite station, Wyo., description and position of .....	
Q.		
54	Queen Mills, Md., position of .....	
280	Quincy station, Wash., description and position of .....	
R.		
2:0-2:81	Ragged station, Wash., description and position of .....	
110	Ragtown, Ohio, position of .....	
161	Randolph, Wis., position of .....	
200-201	Rankin station, Cal., description and position of .....	
203	Ransom, Cal., position of .....	

	Page.		Page.
Rattlesnake station, Wyo., description and position of .....	311	Rose Hill triangulation station, Ga., position of .....	25
Raysville, Ga., position of .....	27	positions between Crawfordville and positions between Lisbon and point on line near .....	28
Red Bluff, Cal., position of .....	203	Roseville, Mich., position of .....	60
positions between Liberty school-house and .....	202-203	Rosillos Mountains station, Tex., description and position of .....	259
between Tehama and .....	203	Rossville, Ohio, position of .....	105
Red station, Ariz., description and position of .....	176	Round Hill, Ariz., position of .....	193
Red Butte station, Ariz., description and position of .....	185-186	Round station, Cal., description and position of .....	201
Red Hill station, Ariz., description and position of .....	197	Round station, Wash., description and position of .....	281
Red Lion, Ohio, position of .....	114	Rowe station, Ariz., description and position of .....	186
Red River, N. Dak., position on .....	92	Royal station, Ariz., description and position of .....	186-187
Red Rock station, Mont., description and position of .....	226-227	Ruble station, W. Va., description and position of .....	156-157
Reeceville, Ohio, position of .....	131	Runnymede, Va., position of .....	146
Reeds, Ala., position of .....	23	Rundell, Pa., position of .....	138
Reef station, Wyo., description and position of .....	311	Ruthsburg, Md., position of .....	54
Reeseville, Wis., position of .....	162	Rutland, N. Dak., position of .....	85
positions between Columbus and .....	162	positions between Lidgerwood and .....	85
Relay, Md., position of .....	57	S.	
Remlap, Ala., position of .....	22	Saco station, Mont., description and position of .....	241
Remove station, Mont., description and position of .....	239	Sacramento River, Cal., position near .....	204
Rensselaer Falls, N. Y., position of .....	83	Saddle station, Ariz., description and position of .....	187
Reynolds station, W. Va., description and position of .....	149-150	Saddle station, Mont., description and position of .....	227
Rice station, Ariz., description and position of .....	173	Saddle station, Utah, description and position of .....	266
Richfield, Ohio, position of .....	98	Saddle station, Wash., description and position of .....	268
Richville, N. Y., position of .....	75	Saddle (2) station, Wash., description and position of .....	282
Ridgeway, Ill., position of .....	29, 30	Sadieville, Ky., position of .....	38
Rincon station, Ariz., description and position of .....	169	Sadsbury, Pa., position of .....	131
Rio, Wis., position of .....	164	Sage station, Mont., description and position of .....	227
Rio Grande pyramid station, Colo., description and position of .....	213-214	Sage station, Wyo., description and position of .....	302
Riverside, Mo., positions between Silver-spring and .....	63	St. Andrews station, Wash., description and position of .....	281-282
Roanes, Va., position of .....	144	St. Andrews schoolhouse station, Wash., description and position of .....	286
Robertson, R. B., work of .....	267	St. Francisville, La., position of .....	51
Rock Bluff, Ariz., position of .....	193	positions between Laurel Hill and .....	51
Rock station, Wyo., description and position of .....	301-302	St. Henry, Ohio, position of .....	105
Rock Creek station, Mont., description and position of .....	240	St. Lawrence, N. Y., position of .....	81
Rock monument station, Mont., description and position of .....	240	St. Louis, Iron Mountain and Southern Railway, positions along .....	65, 68
Rock monument No. 2 station, Mont., description and position of .....	240	St. Louis, Kansas City and Colorado Railroad, positions along .....	62
Rockford, Ohio, position of .....	105	St. Louis and San Francisco Railroad, positions along .....	34, 62
Rocks Wharf, Va., position of .....	147	St. Louis Terminal Railway, positions along .....	64
Rockville, Pa., position 2 miles from .....	131	St. Mary station, Wyo., description and position of .....	303
Rocky station, Mont., description and position of .....	241	Ste. Genevieve, Mo., position of .....	66
Rogers Ford, Pa., position 2 miles east of .....	137	Salem, Ky., position of .....	47
Rogers Gap, Ky., position of .....	38	Salmon, Ga., position of .....	25
Rolette, Minn., positions between Mayville, N. Dak., and .....	92		
Rome, Watertown and Ogdensburg Railroad, positions along .....	82		
Rosa, Mo., position of .....	61		
Rose station, Pa., description and position of .....	130		

Page.	Page.
Salt Lake station, Wash., description and position of .....	293
Samaniego station, Ariz., description and position of .....	169-170
San Xavier Mission station, Ariz., description and position of .....	170
Sanatoga, Pa., position of .....	136
Sand station, Wash., description and position of .....	283
Sand Hill station, Wash., description and position of .....	283
Sand Mountain, Ala., position of .....	23
Sandy Hill, Pa., position 2 miles from .....	131
Sandy station, Wyo., description and position of .....	311-312
Santa Fe, Ohio, position of .....	113
Santa station, Ariz., description and position of .....	177
Santiago station, Tex., description and position of .....	260
Sappington, Md., position of .....	59
Sappington, Mo., position of .....	63
Sargent, R. H., work of .....	264
Savage, Va., position of .....	146
Savern Creek, Ky., position near .....	43
Savona, Ohio, position of .....	122
Savoy station, Mont., description and position of .....	228
Sawmill Mountain station, Tex., description and position of .....	260
Sawtooth station, Utah, description and position of .....	266
Sayre station, W. Va., description and position of .....	150
Schieffelin station, Ariz., description and position of .....	166
Schlagel station, Wash., description and position of .....	283-284
Scooten station, Wash., description and position of .....	289
Scotland, La., position of .....	52
Scotland, Ohio, position of .....	19
Scott, Ohio, position of .....	106
Scrabble, Ky., position near .....	42
Sedalia, Ohio, position of .....	107
positions between Tradersville and .....	117-118
Sedmantown, Ky., position of .....	44
Selma, Ohio, position of .....	118
Seloca, Ala., position of .....	23
Sentinel station, Wash., description and position of .....	284
Septa, Va., position of .....	147
Severson station, Wash., description and position of .....	285
Sewells Mills, Md., position of .....	55
Shackelfords, Va., position of .....	145
Sharon, Ga., position of .....	26
positions between Wrightsboro and .....	27
Sheepshead station, Colo., description and position of .....	211
Shepard station, Wyo., description and position of .....	312
Sherman station, Colo., description and position of .....	214
Shiloh, Ohio, position of .....	109, 120
Shinumo station, Ariz., description and position of .....	187-188
Ship Road, Pa., position of .....	137
Shirley station, Wyo., description and position of .....	302
Short station, Mont., description and position of .....	242
Shrader station, Pa., description and position of .....	128
Sierra Castellan station, Tex., description and position of .....	260-261
Silver station, Ariz., description and position of .....	191-192
Silver station, Utah, description and position of .....	266-267
Silverspring, Mo., position of .....	66
positions between Riverside and .....	66
Silvies station, Oreg., description and position of .....	245-246
Simms, Ohio, position of .....	103
Slaughter, La., position of .....	52
Slaughterville, Ky., position of .....	48
positions between Elmwood and .....	48
Sloan, Ala., position of .....	19
Smith station, W. Va., description and position of .....	155
Smithfield, Va., position of .....	147
Snake Butte station, Mont., description and position of .....	228
Sneffels station, Colo., description and position of .....	215
Snow station, Oreg., description and position of .....	246
Snyderville, Ohio, position of .....	103
Soda station, Oreg., description and position of .....	246-247
Sonoita station, Ariz., description and position of .....	170
"Soo" Railway, positions along .....	85
South Albion, N. Y., position of .....	78
positions between Arthur and .....	78
between Camden and .....	80
between Constantia and .....	78
South Boulder station, Colo., description and position of .....	207
South New Lyme, Ohio, position of .....	96
South Solon, Ohio, position of .....	117
Southern Railway, positions along .....	21, 39-40, 41
Southern Pacific Railroad, positions along .....	202-203, 205
Marysville Branch, positions along ..	204
Spanker, Ohio, position of .....	109
Springboro, Ohio, position of .....	114
Springdale, Ohio, position of .....	107
Springfield, Ohio, position of .....	102
positions between London and .....	102
Spur, Ky., position of .....	45
Square Rock, Ariz., position of .....	193
Square station, Mont., description and position of .....	242
Square Butte station, Mont., description and position of .....	229
Squaw station, Mont., description and position of .....	229
Squaw station, Wash., description and position of .....	290
Squaw Peak station, Ariz., description and position of .....	192

	Page.		Page.
Staats station, W. Va., description and position of .....	154	The Horn station, Wyo., description and position of .....	306-307
Stabler, Md., position of .....	58	Thibideau station, Mont., description and position of .....	229
Stallings, Ill., position of .....	64	Thomas, Ohio, position of .....	117
Stamping Ground, Ky., position of .....	44	Thompson Creek, La., position near .....	51
Stanhope creamery, Ohio, position of .....	96	East Fork, position near .....	51
Stata, Va., position of .....	146	West Fork, position on .....	51
State fishery, Ohio, position of .....	107	Thorndale, Pa., position of .....	133
Steel station, Pa., description and position of .....	130	positions between Atglen and .....	133
Steelville, Pa., position near .....	134	Three Buttes station, Mont., description and position of .....	230
Stevenson station, Wash., description and position of .....	285-286	Three Caves station, Tex., description and position of .....	262
Stewart, J. T., work of .....	177, 215	Three Corners, Ala., position of .....	21
Stiles, Arthur, work of .....	235	Three Rivers, Mo., position of .....	70
Stoneville, Ohio, position of .....	95	Three Springs station, Wash., description and position of .....	286-287
Stonewhet station, Ariz., description and position of .....	160-167	Tidewell, Ala., position of .....	23
Stony Creek, Cal., position of .....	203	Tiger Butte station, Mont., description and position of .....	243
Stratton Creek, Ohio, position on .....	96	Tignall, Ga., position of .....	26
Strawberry station, Oreg., description and position of .....	247	positions between Washington and .....	26
Stuarts Peak station, Tex., description and position of .....	261	Tilden, Ky., position of .....	49
Sue Peak station, Tex., description and position of .....	261-263	Timber Peak station, Wash., description and position of .....	286
Sublime station, Ariz., description and position of .....	188	Tisdale station, Wyo., description and position of .....	307
Sugarloaf station, Utah, description and position of .....	264-265	Toledo, Ill., position of .....	64
Sugarloaf triangulation station, Ill., position of .....	64	Toledo, St. Louis and Western Railroad, positions along .....	64
Sullivant, Ohio, position near .....	102	Topography, eastern division of, work of .....	18-164
Sulphur Springs, Mo., position of .....	66	western division of, work of .....	165-312
Summerford, Ohio, position of .....	106	Tortollitas station, Ariz., description and position of .....	170-171
Sunlight, Mo., position of .....	71	T. 31 N., R. 33 E., quarter section corner station, Mont., description and position of .....	224
Supai station, Ariz., description and position of .....	188	Tradersville, Ohio, position of .....	106
Sussex station, Wyo., description and position of .....	306	positions between Sedalia and .....	117-118
Swearingen station, W. Va., description and position of .....	161	Traverse, primary, in Alabama .....	18-24
Switzer, Ky., position of .....	44	in California .....	201-206
Syenite station, Ariz., description and position of .....	190	in Georgia .....	24-28
		in Illinois .....	29-31, 63-65
T.		in Illinois-Indiana .....	23-29
Tabasco station, Colo., description and position of .....	214	in Kansas .....	31-37
Table Mountain station, Colo., description and position of .....	212	in Kentucky .....	37-50
Tampico station, Mont., description and position of .....	242-243	in Louisiana .....	50-52
Tana, Ohio, position of .....	105	in Maryland .....	53-59
Tatham, Ga., position of .....	27	in Michigan .....	60-61
Tatum, Sledge, work of .....	69, 70, 84, 297	in Missouri .....	61-63, 65-71
Tehama, Cal., position of .....	203, 204	in New York .....	73-84
positions between Chico and .....	204	in North Dakota .....	84-87
between Red Bluff and .....	203	in North Dakota-Minnesota .....	87-94
Terre Bleu Creek, Mo., position on .....	70	in Ohio .....	94-125
Texas, triangulation stations in, descriptions and positions of .....	255-264	in Pennsylvania .....	131-139
Thayer, Kans., position of .....	33	in Virginia .....	143-147
positions between Coffeyville and .....	32-33	in Wisconsin .....	161-164
The Chapel, Ky., position of .....	46	summary of published results, by States .....	17
		Tree E station, W. Va., description and position of .....	155
		Trenton, Ohio, position of .....	114
		Triangulation, summary of published results, by States .....	17

Page	Page.
Triangulation stations in Arizona, descriptions and positions of .. 165-193	Valley Park, Mo., position of .....
in California, descriptions and positions of..... 197-201	Van Meter, Ky., position of..... 39
in Colorado, descriptions and positions of..... 207-215	Van Wert, Ohio, position of .....
in Idaho, descriptions and positions of..... 255	Vandalia station, Mont., description and position of .....
in Montana, descriptions and positions of..... 215-244	Vanderburg, Ky., position of..... 48
in New York, descriptions and positions of..... 72-73	Vandivert, Ohio, position of..... 125
in New York-Vermont, descriptions and positions of .....	Varysburg, N. Y., position of..... 74
in Oregon, descriptions and positions of .....	Venlo, N. Dak., position of .....
in Pennsylvania, descriptions and positions of .....	Vermont, triangulation stations in New York and, descriptions and positions of .....
in Texas, descriptions and positions of .....	Versailles, Ky., position of..... 40
in Washington, descriptions and positions of..... 267-297	Versailles, Ohio, position of .....
in West Virginia, descriptions and positions of..... 147-160	Vesta, Ga., position of .....
in Wyoming, descriptions and positions of .....	Village Springs, Ala., position of..... 22
Triangulation, secondary, stations in Arizona, descriptions and positions of..... 193-197	Vina, Cal., position of..... 204
in Utah, descriptions and positions of .....	Vineyard, Md., position of..... 57
Trotwood, Ohio, position of .....	Viola, Ohio, position of..... 116
Trout station, Oreg., description and position of .....	Virginia, traverse, primary, in..... 143-147
Troy, Ohio, position of..... 110	W.
Trumbell Creek, Ohio, position on..... 95	Wabash River, Ind., old ferry landing above Ohio River, position of..... 29
Tucson court-house station, Ariz., description and position of..... 171	Wade, Ohio, position of..... 96
Tucson south meridian station, Ariz., description and position of..... 171	Wales Center, N. Y., position of..... 74, 77
Tucson standpipe station, Ariz., description and position of..... 171-172	positions between Murrays Corners and..... 74
Turnersville, Pa., position of..... 139	between Orangeville Center and..... 74
Tweedy, Frank, work of..... 297	between Orchard Park and..... 77
Union, Ohio, position of..... 124	Walker station, Mont., description and position of .....
Urquhart, C. F., work of..... 197, 201, 245	Walls Bridge, Va., position of .....
Utah, triangulation, secondary, stations in, descriptions and positions of .....	Walnut Run, Ohio, position of..... 107
Utica, Ky., position of..... 47	Wapakoneta, Ohio, position of..... 113
positions between Henderson and..... 74	Warner station, Ariz., description and position of .....
U.	Warnock Knob, Ala., position of..... 18
Uncompahgre station, Colo., description and position of .....	positions between Chepultepec and .. 23
Undine, Mo., position between Floyd and..... 71	Warren, N. Dak., position of..... 87
Union, Ohio, position of..... 124	positions between Fargo and..... 87
Urquhart, C. F., work of..... 197, 201, 245	Warrensville triangulation station, Ohio, position of .....
Utah, triangulation, secondary, stations in, descriptions and positions of .....	Warrior, Ala., position of..... 23
Utica, Ky., position of..... 47	Warwick, Pa., position of..... 136
positions between Henderson and..... 74	Washington, triangulation stations in, descriptions and positions of .. 267-297
V.	Washington, Ga., position of .....
Vails station, Ariz., description and position of..... 172	positions between Barnett and..... 26
Vale station, Oreg., description and position of..... 253-254	between Tignall and..... 26
	Washington station, Ariz., description and position of..... 177
	Wasson station, Ariz., description and position of .....
	Waterbury, Md., position of..... 59
	Wateka, Ala., position of..... 22
	Waverly, Ky., position of..... 50
	Wayne station, Mont., description and position of .....
	Wayside, Kans., position of..... 36
	Webber's windmill station, Wash., description and position of..... 287-288
	Webster, N. Y., position of..... 76
	Webster, Ohio, position of..... 111
	Weed station, W. Va., description and position of..... 1157

Page.		Page.
21	Weems, Ala., position of .....	76
68	Weingarten, Mo., position of .....	76
255	Weiser station, Idaho, description and position of .....	76
83	Wells, N. Y., position of .....	74
61	Wellston, Mo., position of .....	75
296-297	Wenas station, Wash., description and position of .....	75
290-291	Wenatchee station, Wash., description and position of .....	75
104	Wengerlawn, Ohio, position of .....	244
121	West Alexandria, Ohio, position of .....	262-263
78	West Amboy, N. Y., position of .....	202
80	positions between Williamston and .....	205
104	West Baltimore, Ohio, position of .....	133
231	West Base station, Mont., description and position of .....	18-164
123	Westbow, Ohio, position of .....	52
231-232	West Cherry station, Mont., description and position of .....	288
262	West Corazones station, Tex., description and position of .....	61
114, 115	West Dayton, Ohio, position near .....	95
193	West End (Double Butte), Ariz., position of .....	158
46	Westerfield, Ky., position of .....	161-164
254	Westfall station, description and position of .....	137
244	West Fork station, Mont., description and position of .....	137
44	West Frankfort, Ky., position of .....	83
134	West Grove, Pa., position of .....	82
102	West Jefferson, Ohio, position of .....	107
106	position 4 miles north of .....	21
113	Westminster, Ohio, position of .....	123
79	West Monroe, N. Y., position of .....	104
98	West Richfield, Ohio, position of .....	27
49	West Vanderburg, Ky., position of .....	27
49	positions between Lisman and .....	27
147-160	West Virginia, triangulation stations in, descriptions and positions of .....	297-312
89	Wheatland, N. Dak., positions between Fargo and .....	X.
91	positions between Portland and .....	120
288	Wheeler station, Wash., description and position of .....	Y.
291	Whiskeydick station, Wash., description and position of .....	232
133	White Bear, Pa., position of .....	142
137	Whitford, Pa., position of .....	52
137	Whiteland, Pa., position of .....	51
144	Whitemarsh, Va., position of .....	135
67	Whites, Mo., position of .....	130-131
202	Williams, Cal., position of .....	144
205	position between Butte City and .....	Z.
137	Williams Corners, Pa., position of .....	52
157	Williams station, W. Va., description and position of .....	202
80	Williamston, N. Y., position near .....	232-233
80	positions between West Amboy and .....	
37, 44	Williamstown, Ky., position of .....	
41-44	positions between A vonstoke and .....	
37-39	between Lexington and .....	
76	Williamsville, N. Y., position of .....	
76	positions between Murrays Corners and .....	
76	between Orchard Park and .....	
74	Williston, N. Y., position of .....	
75	Willow Bend Inn, N. Y., position of .....	
75	positions between Murrays Corners and .....	
75	between Orangeville Center and .....	
244	Willow station, Mont., description and position of .....	
262-263	Willow Mountain station, Tex., description and position of .....	
202	Willows, Cal., position of .....	
205	positions between Jacinto and .....	
133	Wilmington and Northern Railroad, positions along .....	
18-164	Wilson, H. M., work in charge of .....	
52	Wilson, La., position of .....	
288	Winchester station, Wash., description and position of .....	
61	Windmill Point light-house, Mich., position of .....	
95	Windsor Mills, Ohio, position of .....	
158	Windy station, W. Va., description and position of .....	
161-164	Wisconsin, traverse, primary, in .....	
137	Woodbine, Pa., position of .....	
137	positions between Malvern and .....	
83	Woodbridge Corners, N. Y., position of .....	
82	positions between Canton and .....	
107	Wooddale, Ohio, position of .....	
21	Woodlawn, Ala., position of .....	
123	Woodville, Ohio, position of .....	
104	Wrights, Ohio, position of .....	
27	Wrightsboro, Ga., position of .....	
27	positions between Lincolnton and .....	
27	between Sharon and .....	
297-312	Wyoming, triangulation stations in, descriptions and positions of .....	
89	Xenia, Ohio, position of .....	
91		
288		
291		
133		
137		
137		
144		
67		
202		
205		
137		
157		
80		
80		
37, 44		
41-44		
37-39		
76		
76		
74		
75		
75		
75		
244		
262-263		
202		
205		
133		
18-164		
52		
288		
61		
95		
158		
161-164		
137		
137		
83		
82		
107		
21		
123		
104		
27		
27		
27		
297-312		
120		
232		
142		
52		
51		
135		
130-131		
144		
52		
202		
232-233		