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4-679.

Book A.

MAY 7-1910

Accepted - Ltr E - 9/20/10

BOOK 2192

FIELD NOTES

2192

OF THE SURVEY OF THE

2192

*North, South and East Boundaries
of Township 19 North, Range 18 West
and the East Boundary of Township
20 North, Range 18 West.*

2192

*Of the Gila & Salt River Base & Meridian,
the Territory of Arizona*

AS SURVEYED BY

Kred W. Podoff

, United States Deputy Surveyor,

Under his Contract No. *155*, dated *March 10*, 1909

Survey commenced *December 15*, 1909

Survey completed *December 23*, 1909

6-151

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NAMES AND DUTIES OF ASSISTANTS.

<i>A. P. Kerns.</i>	<i>Chairman</i>
<i>But Lyon.</i>	<i>Chairman</i>
<i>Ralph R. Ellis</i>	<i>Moderator</i>
<i>R. N. Stark</i>	<i>Orator</i>
<i>T. M. Parker</i>	<i>Orator</i>
<i>George Newell</i>	<i>Playman</i>

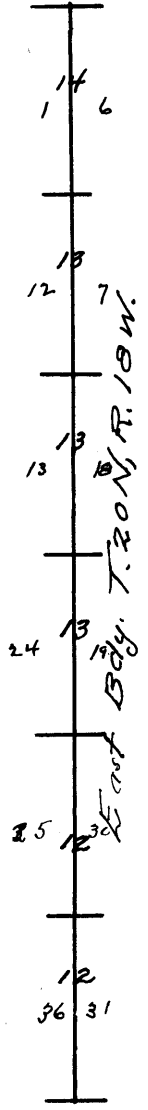
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BOOK 2192

INDEX DIAGRAM.

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Meanders Page.....

PRELIMINARY OATHS OF ASSISTANTS.

WE, C. P. Kerns and Bert Lyon do solemnly swear that we will well and faithfully execute the duties of chainmen; that we will level the chain upon even and uneven ground, and plumb the tally pins, either by sticking or dropping the same; that we will report the true distances to all notable objects, and the true lengths of all lines that we assist in measuring, to the best of our skill and ability, and in accordance with instructions given us, in the survey of the S. E. & N. Bdy. Township 18 N. Range 18 W. & East Bdy T 20 N. R. 18 W.

C. P. Kerns, Chainman.
Bert Lyon, Chainman.

Subscribed and sworn to before me this 10 day of December, 1909



W. J. Ferrieh
Notary Public

WE, Ralph R. Ellis and do solemnly swear that we will well and truly perform the duties of moundmen in the establishment of corners, according to the instructions given us, to the best of our skill and ability, in the survey of the S. E. & N. Bdy. of T. 19 N., Rg. 18 West. & E. Bdy of T 20 N. R. 18 W

Ralph R. Ellis, Moundman.
Moundman.

Subscribed and sworn to before me this 10 day of December, 1909



W. J. Ferrieh
Notary Public

WE, R. N. Stark and J. M. Parker do solemnly swear that we will well and truly perform the duties of axmen in the establishment of corners and other duties, according to instructions given us, to the best of our skill and ability, in the survey of the S. E. & N. Bdy of Tp. 19 N. Rg. 18 W., and E. Bdy of T 20 N. R. 18 W

R. N. Stark, Axman.
J. M. Parker, Axman.

Subscribed and sworn to before me this 10 day of December, 1909



W. J. Ferrieh
Notary Public

I, George Newell, do solemnly swear that I will well and truly perform the duties of flagman according to instructions given me, to the best of my skill and ability, in the survey of the S. E. & N. Bdy of T. 19 N., R. 18 W. & Tp. 20 N., Rg. 18 W.

George Newell, Flagman.

Subscribed and sworn to before me this 10 day of December, 1909



W. J. Ferrieh
Notary Public

~~Survey of the South Bay of Tps. 19 N., Rgs. 18 West.~~

chain s

Survey commenced December 15, 1909, and executed with a Young and Sons light mountain transit No. 7532, with solar attachment. The horizontal limb is provided with two double veriners placed opposite to each other, reading to single minutes of arc, which is also the least count of the veriners of latitude and declination arcs.

The instrument was examined, tested on the true meridian at Phoenix, found correct and was approved by the Surveyor General for Arizona.

I examine the adjustments of the transit and find them correct; then to test the solar apparatus by comparing its indications, resulting from solar observations made during a.m., and p.m., hours, with a meridian determined by observations on Polaris, I proceed as follows:

At the cor. of Tps. 18 and 19 N., Rgs. 18 and 19 W., latitude $34^{\circ}59'19''$ N., longitude $114^{\circ}12'25''$ W.; I set off $34^{\circ}59'$ N. on the lat. arc., $23^{\circ}13'$ S. on the decl. arc and at 3 h., 30 m., p.m., l.m.t., determine a meridian with the solar and mark a point thereof, on a stone firmly set in the ground 5 chs. N. of the cor.

December 15.

December 16, 1909; At 1 h. 47 m., a.m., by my watch which has correct l.m.t., I observe polaris at western elongation in accordance with the Manual of Instructions and mark a point in the line thus determined on a peg driven in the ground 5 chs. N. of my station.

At 8 h. 00 m., a.m., l.m.t., I lay off the azimuth of Polaris, $1^{\circ}26'$ to the East, and mark the meridian thus determined by a small cross on the rock set December 15, on which the meridian coincides with the meridian determined by the solar.

At 8 h. 20 m., a.m., l.m.t., I set off $34^{\circ}59'$ N. on the lat. arc; $23^{\circ}15'$ S. on the decl. arc; and mark a point in the meridian determined by the solar, by a small groove in the stone already set 5 chs. N. of my station; this mark coincides with the meridian established by Polaris observation.

The solar apparatus, by a.m., and p.m., observations defines positions for meridians which coincide with the meridian established by Polaris observations; therefore I conclude that the adjustments of the instrument are satisfactory.

The magnetic bearing of the true meridian at 8 h. 30 m., a.m., is $N. 15^{\circ}08' W.$; the angle thus determined gives the magnetic declination as $15^{\circ}08' E.$

From the Tp. cor. already desc., I run East bet. secs. 6 and 31,

Desc. E. slope of Black Mts. over loose malpais rocks thru dense underbrush.

38.97 Set a malpais stone, 28x10x8 ins., 21 ins. in the ground, for $\frac{1}{4}$ sec. cor., marked $\frac{1}{4}$ on N. face; and raise a mound of stone, 2 ft. base, $1\frac{1}{2}$ ft. high, N. of cor. Pits impracticable

78.97 Set a malpais stone, 20x10x8 ins., 15 ins., in the ground, for cor. of secs. 5, 6, 31 and 32, marked with 5 notches on the E. and 1 notch on the W. edge; and raise a mound of stone, 2 ft. base, $1\frac{1}{2}$ ft. high W. of cor. Pits impracticable
Land, mountainous and rocky.

Soil, rocky; 4th rate.

No timber.

Underbrush, greasewood and catclaw.

Land mountainous, covered with loose rocks and dense underbrush, and on account of the scarcity of water and other reasons more fully explained at the end of these notes, exceptionally difficult to survey, 78.97 chs

Marked & witnessed as desc. by the Sur. Genl.

South Bdy. of Tp. 19 N., Rg. 18 West.

chains
 Thence I run
 East bet. secs. 5 and 32,
 Descend E. slope of mountain over loose rocks thru
 dense underbrush.
 30.70 Wash, 25 lks. wide, course SE. acs. over loose rocks.
 35.00 Top of ridge, bears NW. and SE, Desc. over loose rocks.
 40.00 Set a malpais stone, 18x10x6 ins., 12 ins., in the ground,
 for $\frac{1}{4}$ sec. cor., marked $\frac{1}{4}$ on N. face; and raise a mound of
 stone, 2 ft. base, $1\frac{1}{2}$ ft. high N. of cor. Pits impracticable.
 53.75 Wash, 10 lks. wide, course SE.
 73.60 Wash, 30 lks. wide, course SE.
 80.00 Set a malpais stone, 24x10x8 ins., 18 ins. in the ground, for
 cor. of secs. 4, 5, 32 and 33, marked with 2 notches on W.
 and 4 notches on the E. edge; and raise a mound of stone
 2 ft. base, $1\frac{1}{2}$ ft. high, W. of cor. Pits impracticable.
 Land, mountainous.
 Soil, rocky; 4th rate.
 No timber.
 Underbrush, greasewood, catclaw and cacti.
 Land mountainous, covered with loose rocks and dense unde
 brush, and on account of the scarcity of water and other
 reasons more fully explained at the end of these notes,
 exceptionally difficult to survey, 80.00 chs.
 At this cor. I set off $23^{\circ}15'$ S., on the decl. arc; and
 observe the sun on the meridian at noon; the resulting
 latitude is $34^{\circ}59'N$.

Thence I run East bet. secs. 4 and 33
 Descend over loose rocks thru dense underbrush.
 1.50 Wash, 50 lks. wide, course S. Asc. steep slope
 19.00 Sacramento Wash, 15 lks. wide, course S. Asc. steep slope
 over loose rocks.
 30.00 Over broken land covered with loose rocks.
 40.00 Set a malpais stone, 15x12x8 ins., 10 ins. in the ground, for
 $\frac{1}{4}$ sec. cor., marked $\frac{1}{4}$ on N. face; and dig pits, 18x18x12 ins.
 E. and W. of stone, 3 ft. dist.; and raise a mound of earth
 3 ft. base, $1\frac{1}{2}$ ft. high N. of cor.
 53.50 Wash, 40 lks. wide, course SW. Asc. steep slope over
 loose malpais rocks.
 63.00 Top of ridge, bears NE. and SW.; Desc. steep slope over 1
 loose rocks.
 68.20 Wash, 25 lks. wide, course SW. Asc. steep slope over loose
 malpais rocks.
 80.00 Set a malpais stone, 24x5x5 ins., 18 ins. in the ground, for
 cor. of secs. 3, 4, 33 and 34; marked with 3 notches on the
 E. and W. edges; and raise a mound of stones, 2 ft. base,
 $1\frac{1}{2}$ ft. high, W. of cor. Pits impracticable.
 Land, mountainous.
 Soil, rocky; 4th rate.
 No timber.
 Underbrush, greasewood, catclaw and cacti.
 Land, mountainous, covered with loose rocks and dense
 underbrush, and on account of the scarcity of water and
 other reasons more fully explained at the end of these
 notes, exceptionally difficult to survey, 80,00 chs.
 December, 16, 1909.

December 17; At 8 h 00 m., a.m., l.m.t., I set off $23^{\circ}17\frac{1}{2}'$
 S. on the decl. arc; $34^{\circ}59'N$ on the lat. arc and deter
 mined a meridian with the solar at the cor. of secs.
 3, 4, 33 and 34:
 Thence I run
 East bet. secs. 3 and 34.
 Over rolling land covered with loose malpais rocks
 thru dense underbrush,
 9.35 Wash 20 lks. wide, course SW. Asc. over loose rocks.
 20.00 Top of ridge, bears NE. and SW. Desc. over loose rocks
 31.55 Wash, 25 lks. wide, course SW. Asc. over loose rocks.

Survey of the South Ely of Tps. 19 N., Rgs. 19 West.

chains.
 40.00 Set a malpais stone, 24x12x8 ins., 18 ins. in the ground, for $\frac{1}{4}$ sec. cor., marked $\frac{1}{4}$ on N. face; and raise a mound of stone, 2 $\frac{1}{2}$ ft. base, 1 $\frac{1}{2}$ ft. high, N. of cor. Pits impracticable.
 41.00 Wash, 10 lks. wide, course SW.
 47.00 Top of ridge, bears NE. and SW., Desc. over loose rocks.
 54.85 Wash, 30 lks. wide, course SW. Asc. over loose rocks.
 62.00 Top of ridge, bears NE. and SW. Desc. over loose rocks.
 63.00 Across wash, course SW.
 75.50 Leave wash, course SW. Asc. over loose rocks.
 80.00 Set a malpais stone, 20x8x8 ins., 15 ins. in the ground, for cor. of secs. 2, 3, 34 and 35; marked with 2 notches on the E., and 4 notches on the W. edge; and raise a mound of stone, 2 ft. base, 1 $\frac{1}{2}$ ft. high W. of cor. Pits impracticable.
 Land, rolling and mountainous.
 Soil, stony and rocky; 3rd. and 4th rate.
 No timber.
 Underbrush, greasewood, sage, catclaw and cacti.
 Land, rolling and mountainous, covered with loose rocks and dense underbrush, and, on account of the scarcity of water and for other reasons more fully explained at the end of these notes, exceptionally difficult to survey, 80.00 chs.

Thence I run

East bet. secs. 2 and 35,

Over rolling land covered with loose rocks thru dense underbrush.

40.00 Set a malpais stone, 15x8x8 ins., 10 ins. in the ground, for $\frac{1}{4}$ sec. cor., marked $\frac{1}{4}$ on N. face; and raise a mound of stone, 2 ft. base, 1 $\frac{1}{2}$ ft. high N. of cor. Pits impracticable.

57.45 Wash, 30 lks. wide, course SW.

80.00 Set a malpais stone, 20x10x10 ins., ^{15 ins} in the ground, for cor. of secs. 1, 2, 35 and 36, marked with 1 notch on E. and 5 notches on the W. edges. and raise a mound of stone, 2 ft. base, 1 $\frac{1}{2}$ ft. high, W. of cor. Pits impracticable.

Land, rolling.

Soil, rocky; 3rd rate.

No timber.

Underbrush, greasewood, sage, and cacti.

Rolling land covered with loose rocks and dense underbrush, and, on account of the scarcity of water and for other reasons more fully explained at the end of these notes, exceptionally difficult to survey, 80.00 ch

At this cor. I set off $25^{\circ} 20'$ S. on the decl. arc and observe the sun on the meridian at noon; the resulting latitude is $34^{\circ} 59' N.$

Thence I run

East bet. secs. 1 and 36,

Over rolling land covered with loose rocks thru dense underbrush.

10.25 Wash, 15 lks. wide, course SW. Asc. over loose rocks.

15.00 Top of ridge, bears NE. and SW. Desc. over loose rocks.

19.20 Wash, 20 lks. wide, course SW. Asc. over loose rocks.

26.00 Top of ridge, bears NE. and SW. Desc. over loose rocks.

30.85 Wash, 40 lks. wide, course SW. Asc. over loose rocks.

36.00 Top of ridge, bears NE. and SW. Desc. over loose rocks.

38.10 Wash, 10 lks. wide, course SW. Asc. over loose rocks.

40.00 Set a malpais stone, 24x10x8 ins., 18 ins. in the ground, for $\frac{1}{4}$ sec. cor., marked $\frac{1}{4}$ on N. face; and raise a mound of stone, 2 ft. base, 1 $\frac{1}{2}$ ft. high, N. of cor. Pits impracticable.

44.00 Wash, 50 lks. wide, course SW. Asc. over loose rocks

54.00 Top of ridge, bears NE. and SW. Desc. over loose rocks.

67.25 Wash, 100 lks. wide, course SW. Asc. over loose rocks.

80.00 Set a quartzite stone, 32x14x14 ins., 24 ins. in the ground for cor. of Tps. 18 and 19 N., Rgs. 17 and 18 W., marked 19 N on NE, 17 W on SE., 18 N on SW., and 18 W on NW. face, with 6 notches on the N, S, E, and W edges, and raise a mound of stone, 2 ft. base 1 $\frac{1}{2}$ ft. high, S. of cor.

65

Survey of the South Edy. of Tp. 19 N., Rg. 18 West.

chains

Pits impracticable.
 Land, rolling and mountainous.
 Soil, rocky; 3rd rate.
 No timber.
 Underbrush, greasewood, catclaw, sage and cacti.
 Rolling and mountainous land covered with loose rocks
 and dense underbrush, and, on account of the scarcity
 of water and for other reasons more fully explained at
 the end of these notes, exceptionally difficult to
 survey, 80.00 chs.

December 17, 1909.

Accepted for deposit at the U.S. Geological Survey, Washington, D.C., December 17, 1909.
 The original copy of this report is deposited in the files of the U.S. Geological Survey.

Survey of the East Rdy. of Tn. 19 N., Rg. 18 West.

chains.

December 18, 1909; At 8h 00m. a.m., l.m.t., I set off 34' 59' N. on the lat. arc; 23° 19' S. on the decl. arc and determine a meridian with the solar at the cor. of Tps. 18, and 19, N., Rgs. 17 and 18 West, recently established by me.

Thence I run

North bet. secs. 31 and 36.

Over rolling and broken land covered with loose rocks thru dense underbrush.

0.75 Wash, 50 lks. wide, course SW. Asc. over loose rocks.
 30.38 Wash, 40 lks. wide, course SW. Over loose rocks.
 38.90 Wash, 60 lks. wide, course SW. Over loose rocks.
 40.00 Set a malpais stone, 29x8x8 ins., 15 ins. in the ground, for $\frac{1}{4}$ sec. cor. marked $\frac{1}{4}$ on W. face; and raise a mound of stone, 2ft. base, 1 $\frac{1}{2}$ ft. high, W. of cor. Pits impracticable.
 70.00 Wash, 20 lks. wide, course SW. over loose rocks.
 76.45 Wash, 20 lks. wide, course SW. Over loose rocks.
 80.00 Set a malpais stone, 24x10x7 ins., 18 ins. in the ground, for cor. of secs. 25, 30, 31 and 36, marked with 1 notch on the S. and 5 notches on the N. edge; and raise a mound of stone, 2ft. base, 1 $\frac{1}{2}$ ft. high, W. of cor. Pits impracticable.
 Land, rolling and broken.
 No timber,
 Soil, rocky; 3rd rate.
 Underbrush, greasewood, sage and cacti.
 Rolling and broken land covered with loose rocks and dense underbrush, and, on account of the scarcity of water and for other reasons more fully explained at the end of these notes, exceptionally difficult to survey,
 80.00 chs.

Thence I run

North bet. secs. 25 and 30.

Over slightly rolling land covered with loose rocks and dense underbrush.

19.25 Wash, 20 lks. wide, course SW. Over loose rocks.
 30.00 Wash, 200 lks. wide, course SW. Over loose rocks
 40.00 Set a malpais stone, 15x12x8 ins., 10 ins. in the ground, for $\frac{1}{4}$ sec. cor., marked $\frac{1}{4}$ on W. face; and raise a mound of stone, 2ft. base, 1 $\frac{1}{2}$ ft. high, W. of cor. Pits impracticable.
 65.40 Wash, 30 lks. wide, course SW. Over loose rocks.
 80.00 Set a malpais stone, 24x8x8 ins., 18 ins. in the ground, for cor. of secs. 19, 24, 25 and 30; marked with 2 notches on the S. and 4 notches on the N. edge; and raise a mound of stone, 2ft. base, 1 $\frac{1}{2}$ ft. high, W. of cor. Pits impracticable.
 Land, slightly rolling.
 Soil, rocky; 3rd. rate.
 No timber.
 Underbrush, greasewood, sage and cacti.
 Slightly rolling land covered with loose rocks and dense underbrush, and, on account of the scarcity of water and other reasons more fully explained at the end of these field notes, exceptionally difficult to survey,
 80.00 chs.

At this cor. I set off 23° 22' S. on the decl. arc and observe the sun on the meridian at noon; the resulting lat. is 38° 01' N.

Thence I run

North bet. secs. 19 and 24.

Over slightly rolling land covered with loose rocks thru dense underbrush.

3.35 Wash, 20 lks. wide, course SW. Over loose rocks.
 31.00 Wash, 20 lks. wide, course SW. Over loose rocks.
 40.00 Set a malpais stone, 18x10x8 ins., 12 ins. in the ground, for $\frac{1}{4}$ sec. cor. marked $\frac{1}{4}$ on W. face; and raise a mound of stone, 2ft. base, 1 $\frac{1}{2}$ ft. high, W. of cor. Pits impracticable.
 44.75 Wash, 20 lks. wide, course SW. over loose rocks.
 58.00 Wash, 20 lks. wide, course SW, Over loose rocks.
 79.30 Wash, 20 lks. wide, course W. over loose rocks.

Survey of the East Bdy. of Tp. 19 N., Rg. 18 West.

chains.
80.00

Set a malpais stone, 20x6x6 ins., 15 ins. in the ground, for cor. of secs. 13, 18, 19 and 24; marked with 3 notches on the N. and S. edges; and raise a mound of stone, 2 ft. base, 1 1/2 ft. high, W. of cor. Pits impracticable.

Land, slightly rolling.

Soil, rocky; 3rd. rate.

No timber.

Underbrush, greasewood, sage, catclaw and cacti.

Slightly rolling land covered with loose rocks and dense underbrush, and, on account of the scarcity of water and for other reasons more fully explained at the end of these field notes, exceptionally difficult to survey 80.00 chs.

December 18, 1909.

December 19; At 8h.00m., a.m., l.m.t., I set off 35° 02' N, on the lat. arc; 23° 21' S. on the decl. arc, and determine a meridian with the solar at the cor. of secs. 13, 18, 19 and 24.

Thence I run

North bet. secs. 13 and 18.

Over slightly rolling land covered with loose rocks thru dense underbrush.

7.00 Wash, 20 lks. wide, course SW. Over loose rocks.

21.45 Wash, 20 lks. wide, course SW, Over loose rocks.

40.00 Set a malpais stone, 15x8x6 ins., 10 ins. in the ground, for 1/4 sec. cor., marked 1/4 on W. face; dig pits, 18x18x12 ins., N. and S. of stone, 3 ft. dist., and raise a mound of earth, 3 1/2 ft. base, 1 1/2 ft. high, W. of cor.

64.45 Wash, 15 lks. wide, course SW. Over loose rocks.

71.50 Wash, 15 lks. wide, course SW. Over loose rocks.

80.00 Set a malpais stone, 20x8x6 ins., 15 ins. in the ground, for cor. of secs. 7, 12, 13 and 18; marked with 2 notches on the N., and 4 notches on the S. edge; and raise a mound of stone, 2 ft. base, 1 1/2 ft. high, W. of cor. Pits impracticable.

Land, slightly rolling.

Soil, rocky; 3rd. rate.

No timber,

Underbrush, greasewood, sage and cacti.

Slightly rolling land covered with loose rocks and dense underbrush, and, on account of the scarcity of water and other reasons more fully explained at the end of these notes, exceptionally difficult to survey, 80.00 chs.

Thence I run

North bet. secs. 12 and 7.

Over rolling land covered with loose rocks thru dense underbrush.

7.18 Wash, 20 lks. wide, course SW. Over loose rocks.

25.80 Wash, 20 lks. wide, course SW. Over loose rocks.

34.25 Wash, 20 lks. wide, course SW. Over loose rocks.

37.30 Wash, 20 lks. wide, course SW. Over loose rocks.

40.00 Set a malpais stone, 18x8x8 ins., 12 ins. in the ground, for 1/4 sec. cor., marked 1/4 on W. face; and raise a mound of stone, 2 ft. base, 1 1/2 ft. high, W. of cor. Pits impracticable.

42.00 Wash, 35 lks. wide, course SW. Over loose rocks.

48.00 Wash, 20 lks. wide, course SW. Over loose rocks.

59.18 Wash, 20 lks. wide, course SW. Over loose rocks.

64.20 Wash, 20 lks. wide, course SW. Over loose rocks.

70.30 Wash, 20 lks. wide, course SW. Over loose rocks.

73.35 Wash, 20 lks. wide, course SW. Over loose rocks.

80.00 Set a malpais stone, 18x12x10 ins., 12 ins. in the ground, for cor. of secs. 1, 6, 7 and 12; marked with 1 notch on the N. and 5 notches on the S. edges; dig pits, 18x18x12 ins., in each sec. 5 1/2 ft. dist.; and raise a mound of earth, 4 ft. base, 2 ft. high, W. of cor.

Survey of the East Bdy. of Tp. 19 N., Rg. 18 W.

chains.

Land, rolling.
Soil, rocky; 3rd rate.
No timber,

Underbrush, greasewood, sage and cacti.

Rolling land covered with loose rocks and dense underbrush, and, on account of the scarcity of water and other reasons more fully explained at the end of these notes, exceptionally difficult to survey, 80.00 chs.

At this cor. I set off $23^{\circ}24'$ S. on the decl. arc; and observe the sun on the meridian at noon; the resulting lat. is $35^{\circ}03\frac{1}{2}'$ N. ✓

Thence I run

North bet. secs. 1 and 6.

Over slightly rolling land covered with loose rocks thru dense underbrush.

1.30 Wash, 15 lks. wide, course SW. Over loose rocks.
10.35 Wash, 15 lks. wide, course SW. Over loose rocks.
14.00 Wash, 15 lks. wide, course SW. Over loose rocks.
17.55 Wash, 15 lks. wide, course SW. Over loose rocks.
30.20 Wash, 15 lks. wide, course SW. Over loose rocks.
37.60 Wash, 15 lks. wide, course SW. Over loose rocks.
40.00 Set a malpais stone, 18x8x8 ins., 12 ins. in the ground, for $\frac{1}{4}$ sec. cor., marked $\frac{1}{4}$ on W. face; and raise a mound of stone, 2 ft. base, $1\frac{1}{2}$ ft. high, W. of cor. Pits impracticable.
65.75 Wash, 20 lks. wide, course SW. Over loose rocks.
67.05 Wash, 20 lks. wide, course SW. Over loose rocks.
80.00 Set a malpais stone, 18x10x10 ins., 12 ins. in the ground for cor. of Tps. 19 and 20 N., Rg. 17 and 18 W. marked 20 N on NE., 17 W on SE., 19 N on SW., and 18 W on NW., face, with 6 notches on N.S.E. and W edges; and raise a mound of stone, 2 ft. base, $1\frac{1}{2}$ ft. high, S. of cor. Pits impracticable.

Land, slightly rolling.

Soil, rocky; 3rd rate.

No timber.

Underbrush, greasewood, sage, cacti.

Slightly rolling land covered with loose rocks and dense underbrush, and, on account of the scarcity of water and other reasons more fully explained at the end of these notes, exceptionally difficult to survey, 80.00 chs.

December 19, 1909;

Survey of the North Bdy. of Tp. 19 N., Rg. 18 West.

chains.

December 20; 1909. At 8h 00m., a.m., i.m.t., I set off $35^{\circ}04\frac{1}{2}'$ N. on the lat. arc; $23^{\circ}22'$ S. on the decl. arc; and determine a meridian with the solar at the cor. of Tps. 19 and 20 N., Rgs. 17 and 18 W.;

Thence I run

West on a random line, along the N. bdy. of Tp. 19 N., R. 18 W., setting temp. $\frac{1}{4}$ sec. and sec. cors. at intervals of 40.00 chs.; and at 479.17 chs. intersect the 5th Guide Meridian West at a point 110 lks. S. of the cor. of Tps. 19 and 20 N., Rgs. 18 and 19 W., which is a malpais stone, 8x8x6 ins., above ground, marked and witnessed as described by the Surveyor General. The falling answers

to a correction of $0^{\circ}08'$, therefore I run

S $89^{\circ}52'$ E. on true line bet. secs. 6 and 31.

Slowly descend thru dense underbrush.

7.00 Wash, 15 lks. wide, course SE.

32.30 Wash, 15 lks. wide, course SE.

39.17 Set a malpais stone, 20x10x5 ins., 15 ins. in the ground, for $\frac{1}{4}$ sec. cor., marked $\frac{1}{4}$ on N. face; dig pits, 18x18x12 ins. E. and W. of stone, 3 ft. dist.; and raise a mound of earth $3\frac{1}{2}$ ft. base, $1\frac{1}{2}$ ft. high, N. of cor.

53.90 Wash, 20 lks. wide, course SE.

58.45 Wash, 200 lks. wide, course S.

79.17 Set a malpais stone, 18x8x6 ins., 12 ins. in the ground, for cor. of secs. 5, 6, 31 and 32; marked with 1 notch on W. and 5 notches on E. edge; dig pits, 18x18x12 ins., in each sec., $5\frac{1}{2}$ ft. dist.; and raise a mound of earth, 4 ft. base, 2 ft. high, W. of cor.

Land, slightly rolling.

Soil, gravelly and rocky; 3rd rate.

No timber.

Underbrush, greasewood, sage and catclaw.

Slightly rolling land covered with dense underbrush and, on account of the scarcity of water and other reason more fully explained at the end of these notes, exception, ally difficult to survey, 79.17 chs.

At this cor. I set off $23^{\circ}25'$ S. on the decl. arc and observe the sun on the meridian at noon; the resulting lat. is $35^{\circ}04\frac{1}{2}'$ N.

Thence I run

S $89^{\circ}52'$ E. bet. secs. 5 and 32.

Over slightly rolling land thru dense underbrush.

8.40 Wash, 60 lks. wide, course SE.

9.40 Wash, 30 lks. wide, course SE.

13.45 Wash, 20 lks. wide, course SE.

37.35 Road, Kingman to Goldroads, bears NE. and SW.

37.90 Telephone line, bears NE. and SW.

40.00 Set malpais stone, 18x10x8 ins., 12 ins. in the ground, for $\frac{1}{4}$ sec. cor., marked $\frac{1}{4}$ on N. face; dig pits, 18x18x12 ins., E. and W. of stone, 3 ft. dist.; and raise a mound of earth $3\frac{1}{2}$ ft. base, $1\frac{1}{2}$ ft. high, N. of cor.

40.18 Wash, 10 lks. wide, course SE.

46.00 Sacramento wash, 350 lks. wide, course S.

49.61 Transmission line, bears NE. and SW.

65.90 Wash, 20 lks. wide, course SW.

80.00 Set a malpais stone, 18x8x8 ins., 12 ins. in the ground, for cor. of secs. 4, 5, 32 and 33, marked with 2 notches on W. and 4 notches on E. edge; dig pits, 18x18x12 ins., in each sec., $5\frac{1}{2}$ ft. dist.; and raise a mound of earth, 4 ft. base, 2 ft. high, W. of cor.

Land, slightly rolling.

Soil, gravelly; 3rd rate.

No timber.

Underbrush, greasewood, sage, cacti and catclaw.

Slightly rolling land covered with exceptionally dense underbrush, and, on account of the scarcity of water and other reasons more fully explained at the end of these notes, exceptionally difficult to survey, 80.00 chs.

Survey of the North Bdy of Tn 19 N. Rg. 18 West.

chains

Thence I run
S 89°52'E. bet. secs. 4 and 33.
Over nearly level land thru exceptionally dense underbrush.

- 9.50 Wash, 10 lks. wide, course SW.
- 11.00 Wash, 15 lks. wide, course SW.
- 13.40 Wash, 20 lks. wide, course SW.
- 40.00 Set a malpais stone, 20x8x8 ins., 15 ins. in the ground, for 1/4 sec. cor., marked 1/4 on N. face; dig pits, 18x18x12 ins., E. and W. of stone, 3 ft. dist.; and raise a mound of earth, 3 1/2 ft. base, 1 1/2 ft. high, N. of cor.
- 42.75 Wash, 15 lks. wide, course SW.
- 44.90 Wash, 15 lks. wide, course SW.
- 46.00 Wash, 15 lks. wide, course SW.
- 53.00 Wash, 15 lks. wide, course SW.
- 55.40 Wash, 15 lks. wide, course SW. Over loose rocks.
- 80.00 Set a malpais stone, 20x6x6 ins., 15 ins. in the ground, for cor. of secs. 3, 4, 33 and 34; marked with 3 notches on E. and W. edges; and raise a mound of stone, 2 ft. base, 1 1/2 ft. high, W. of cor. Pits impracticable.
Land, nearly level
Soil, rocky; and gravelly; 3rd rate.
No timber.
Underbrush, greasewood, catclaw, sage and cacti.
Land covered with loose rocks or dense underbrush and on account of the scarcity of water and other reasons more fully explained at the end of these notes, exceptionally difficult to survey, 80.00 chs.

December 20, 1909.

December 21; At 8h.00m., a.m., l.m.t., I set off 35°04 1/2' N. on the lat. arc; 23°22 1/2' S on the decl. arc, and determine a meridian with the solar at the cor. of secs. 3, 4, 33 and 34.

Thence I run
S 89°52'E. bet. secs. 3 and 34.
Over nearly level land thru exceptionally dense underbrush.

- 21.45 Wash, 15 lks. wide, course SW.
- 28.65 Wash, 25 lks. wide, course SW.
- 40.00 Set a malpais stone, 18x6x6 ins., 12 ins. in the ground, for 1/4 sec. cor., marked 1/4 on N. face; dig pits, 18x18x12 ins. E. and W. of stone, 3 ft. dist.; and raise a mound of earth, 3 1/2 ft. base, 1 1/2 ft. high, N. of cor.
- 41.20 Wash, 10 lks. wide, course SW.
- 52.80 Wash, 15 lks. wide, course SW.
- 70.10 Wash, 15 lks. wide, course SW.
- 72.32 Wash, 25 lks. wide, course SW.
- 80.00 Set a malpais stone, 20x12x8 ins., 15 ins. in the ground, for cor. of secs. 2, 3, 34 and 35. marked with 2 notches on E. and 4 notches on W. edges; dig pits, 18x18x12 ins., in each sec. 5 1/2 ft. dist.; and raise a mound of earth, 4 ft. base, 2 ft. high, W. of cor.
Land, nearly level.
Soil, gravelly and stony; 3rd rate.
No timber.
Underbrush, greasewood, sage, cacti, and catclaw.
Land covered with exceptionally dense underbrush, and on account of the scarcity of water and other reasons more fully explained at the end of these notes, exceptionally difficult to survey, 80.00 chs.

Thence I run.
S 89°52'E. bet. secs. 2 and 35.
Slowly Ascending over loose rocks thru exceptionally dense underbrush.

- 3.00 Wash, 15 lks. wide, course SW. Over loose rocks.
- 8.35 Wash, 15 lks. wide, course SW. Over loose rocks.

Survey of the North Bay. of Tp. 19 N., Rg. 18 West.

chains.

18.00	Wash, 15 lks. wide, course SW. Over loose rocks.
18.75	Wash, 15 lks. wide, course SW. Over loose rocks.
34.74	Wash, 15 lks. wide, course SW. Over loose rocks.
40.00	Set a malpais stone, 18x8x6 ins., 12 ins. in the ground, for $\frac{1}{4}$ sec. cor., marked $\frac{1}{4}$ on N. face; dig pits, 18x18x12 ins E. and W. of stone, 3 ft. dist; and raise a mound of earth 3 $\frac{1}{2}$ ft. base, 1 $\frac{1}{2}$ ft. high, N. of cor.
41.00	Wash, 20 lks. wide, course SW. Over loose rocks.
47.10	Wash, 20 lks. wide, course SW. Over loose rocks.
57.85	Wash, 20 lks. wide, course SW. Over loose rocks.
60.00	Wash, 20 lks. wide, course SW. Over loose rocks.
70.15	Wash, 20 lks. wide, course SW. Over loose rocks.
75.15	Wash, 20 lks. wide, course SW. Over loose rocks.
76.45	Wash, 20 lks. wide, course SW. Over loose rocks.
80.00	Set a malpais stone, 24x8x8 ins., 18 ins. in the ground, for cor. of secs. 1, 2, 35 and 36, marked with 1 notch on E. and 5 notches on W. edge.; and raise a mound of stone, 2 ft. base, 1 $\frac{1}{2}$ ft. high, W. of cor. Pits impracticable. Land, rolling. Soil, rocky; 3rd rate. No timber, Underbrush, greasewood, sage, catclaw and cacti. Rolling land covered with loose rocks and exceptionally dense underbrush, and, on account of the scarcity of water and other reasons more fully explained at the end of these notes, exceptionally difficult to survey, 80.00 chs. At this cor. I set off 23 $^{\circ}$ 25' S. on the decl. arc and observe the sun on the meridian at noon; the resulting lat. is 35 $^{\circ}$ 04 $\frac{1}{2}$ ' N.
	Thence I run $S 89^{\circ}52'E.$ bet. secs. 1 and 36. Slowly ascend over loose rocks thru exceptionally dense underbrush.
1.35	Wash, 20 lks. wide, course SW. Over loose rocks.
5.80	Wash, 20 lks. wide, course SW. Over loose rocks.
10.00	Wash, 50 lks. wide, course SW. Over loose rocks.
14.50	Wash, 15 lks wide, course SW. Over loose rocks.
21.00	Wash, 15 lks. wide, course SW. Over loose rocks.
40.00	Set a malpais stone. 24x10x8 ins., 18 ins. in the ground for $\frac{1}{4}$ sec. cor., marked $\frac{1}{4}$ on N. face; and raise a mound of stone, 2 ft. base, 1 $\frac{1}{2}$ ft. high, N. of cor. Pits impracticable
45.85	Wash, 30 lks. wide, course SW. Over loose rocks.
60.90	Wash, 15 lks. wide, course SW. Over loose rocks.
79.35	Wash, 20 lks. wide, course SW. Over loose rocks.
80.00	Intersect the cor. of Tps. 19 and 20. N. Rgs. 17 and 18, W. Land, rolling. <i>heretofore described</i> Soil, rocky; 3rd rate, No timber. Underbrush, greasewood, sage, catclaw and cacti. Rolling land covered with loose rocks and exceptionally dense underbrush, and on account of the scarcity of water and other reasons more fully explained at the end of these notes, exceptionally difficult to survey, 80.00 chs.

December, 21, 1909.

Boundaries of Tp.19 N.,Rg.18 West.

Latitudes,depar tures,and closing errors.

Line designated	True bearing	Distance	Latitudes		Departures	
			N	S	E	W
S.Bdy.of T.19 N.,R.18 W.	East.....	478.97 ^{Chs} ..	^{Chs}	^{Chs}	478.97 ^{Chs} ..	^{Chs}
E.Bdy.T.19 N.,R. 18 W...	North.....	480.00..	480.00	.....	.....	.....
N.Bdy.T.19 N.,R.18 W....	N 89° 52'W...	479.17..	1.12	.....	.....	479.17
5th.G.Meridian W.....	South.....	160.00	.....	160.00	.....	.....
	S 0°12'E.....	40.15	.....	40.15	0.14	.....
	S 0°11'E.....	40.49..	.....	40.49	0.13	.....
	South	240.00..	.....	240.00	.....	.....
Convergency.....	.....	.....	.....	.....	.....	0.51
Totals.....	.....	.....	481.12	480.64	479.24	479.68
Error in lat.....	.....	.....	480.64	.....	.....	479.24
			0.48	Error in Dep..		0.44

GENERAL DESCRIPTION

T 18N.,R. 18 W.,is all Mountainous and covered with dense underbrush. No water in this Tp.

T 19 N.,R 17 W.,Is mountainous. Mineral in the E. half of Tp. There is no water in this Tp.

T 19 N.,R. 18 W. is rough and covered with dense underbrush. There is no water in this Tp.

In order to obtain water while making this survey it was necessary to go a distance of 14 miles. The length of this haul,28 miles to a trip,kept an extra team, wagon and man busy all the time. As it was necessary to make a road from each camp to the road on which the tank we obtained water from was located; and the fact that we had to keep 3 barrels of water on hand for camp use and camp and line team,it was impossible to move camp to suit the work,and I had to work these lines from one camp,making long walks to and from work and materially cutting down the number of miles run in a day.

Although most of these lines passed over ground covered with loose rocks, the stones, were not large enough to use for cor. rocks, and knowing that the most essential part of a survey, is the establishment of cors. which will not be easily destroyed, I employed an extra wagon, team, and man to haul rocks for cors. in preference to setting mounds of earth with deposits and stake in pits which would have been easier and cost less, but would soon have been obliterated. The average haul for rocks was 5 miles and kept the line team busy at all times.

The heavy snow fall here in the early ^{fall} had rotted out the grass, so I ^{was} forced to buy and haul hay from Kingman for the extra teams made necessary by the scarcity of water and the hauling of rocks for the establishment of substantial cors.

The facts that these ^{lines} are partly maximum and the other part nearly maximum, far worse than ordinary intermediate, and the extra expenses and troubles incurred in properly executing the survey of these Tp. exteriors, have made these lines very exceptionally difficult to survey, and I ask ~~to be allowed~~ to be allowed those rates.

Fred W. Rodolf
U.S. Deputy Surveyor.

the East Bdy of Tn 20 N. Rg 18 West

chains.

December 22, 1909; At 8h.00m., a.m., l.m.t, I set off $35^{\circ}04\frac{1}{2}'N$ on the lat. arc; $23^{\circ}23'15''S$ on the decl. arc; and determine a meridian with the solar at the cors, of Tps. 19 and 20 N., Rgs. 17 and 18. W.,

Thence I run

North bet. secs. 31 and 36.

Over slightly rolling land covered with loose rocks thru exceptionally dense underbrush.

1.70	Wash, 15 lks. wide, course SW. Over loose rocks.
13.60	Wash, 20 lks. wide, course SW. Over loose rocks.
19.70	Wash, 20 lks. wide, course SW. Over loose rocks.
21.90	Wash, 20 lks. wide, course SW. Over loose rocks.
25.10	Wash, 20 lks. wide, course SW. Over loose rocks.
31.25,	Wash, 20 lks. wide, course SW. Over loose rocks.
40.00	Set a malpais stone, 24x8x6 ins., 18 ins. in the ground, for $\frac{1}{4}$ sec. cor., marked $\frac{1}{4}$ on W. face; and raise a mound of stone, 2ft. base, $1\frac{1}{2}$ ft. high, W. of cor. Pits impracticable
40.50	Wash, 35 lks. wide, course W. Over loose rocks.
43.00	Wash, 20 lks. wide, course W. Over loose rocks.
46.65	Wash, 75 lks. wide, course SW. Over loose rocks.
61.60	Wash, 20 lks. wide, course SW. Over loose rocks.
64.75	Wash, 15 lks. wide, course SW. Over loose rocks.
77.30	Wash, 15 lks. wide, course SW. Over loose rocks.
80.00	Set a malpais stone, 20x10x8 ins., 15 ins. in the ground for cor. of secs. 25, 30, 31 and 36, marked with 5 notches on N. and 1 notch on the S. edge; and raise a mound of stone, 2ft. base, $1\frac{1}{2}$ ft. high, W. of cor. Pits impracticable

Land, rolling.
Soil, rocky; 3rd rate.
No timber.
Underbrush, greasewood, sage, cacti and catclaw
Rolling land covered with loose rocks and exceptionally dense underbrush, and on account of the scarcity of water and other reasons more fully explained at the end of these notes, exceptionally difficult to survey, 80.00 chs.

Thence I run

North bet. secs. 25 and 30.

Over broken land covered with loose rocks thru exceptionally dense underbrush.

6.00	Wash, 20 lks. wide, course SW. Over loose rocks.
10.60	Wash, 20 lks. wide, course SW. Over loose rocks.
20.35	Wash, 20 lks. wide, course SW. Over loose rocks.
22.75	Wash, 20 lks. wide, course SW. Over loose rocks.
26.24	Wash, 20 lks. wide, course SW. Over loose rocks.
40.00	Set a malpais stone, 18x10x6 ins., 12 ins. in the ground for $\frac{1}{4}$ sec. cor., marked $\frac{1}{4}$ on W. face; and raise a mound of stone, 2ft. base, $1\frac{1}{2}$ ft. high, W. of cor. Pits impracticable
41.40	Wash, 15 lks. wide, course SW. Over loose rocks.
51.70	Wash, 15 lks. wide, course SW. Over loose rocks.
56.15	Wash, 15 lks. wide, course SW. Over loose rocks.
70.15	Wash, 20 lks. wide, course SW. Over loose rocks.
80.00	Set a malpais stone, 15x8x8 ins., 10 ins. in the ground, for cor. of secs. 19, 24, 25 and 30, marked with 2 notches on the S. and 4 notches on N. edge; dig pits, 18x18x12 ins in each sec. $5\frac{1}{2}$ ft. dist.; and raise a mound of earth, 4ft. base, 2ft. high, W. of cor.

Land, broken and rolling.
Soil, rocky; 3rd rate.
No timber.
Underbrush, greasewood, sage, and cacti.
Broken land covered with loose rocks and exceptionally dense underbrush, and on account of the scarcity of water and other reasons more fully explained, at the end of these notes, exceptionally difficult to survey, 80.00 chs.
At this cor. I set off $23^{\circ}25\frac{1}{2}'S$ on the decl. arc and observe the sun on the meridian at noon; the resulting lat. is $35^{\circ}06'N$.

Survey of the East Rdy. of Tp. 20 N., Rg. 18 West

chains.

Thence I run
 North bet. secs. 19 and 24.
 Over slightly rolling land covered with loose rocks
 thru exceptionally dense underbrush.
 7.50 Wash, 25 lks. wide, course SW. Over loose rocks.
 22.45 Wash, 50 lks. wide, course SW. Over loose rocks.
 40.00 Set a malpais stone, 18x8x6 ins., 12 ins. in the ground,
 for $\frac{1}{4}$ sec. cor., marked $\frac{1}{4}$ on W. face; and raise a mound
 of stone, 2 ft. base, $1\frac{1}{2}$ ft. high, W. of cor. Pits impracticable.
 80.00 Set a malpais stone, 20x12x12 ins., 15 ins. in the ground
 for cor. of secs. 13, 18, 19 and 24, marked with 3 notches
 on the N. and S. edges; and raise a mound of stone,
 2 ft. base, $1\frac{1}{2}$ ft. high, W. of cor. Pits impracticable.
 Land, slightly rolling.
 Soil, rocky; 3rd rate.
 No timber,
 Underbrush, greasewood, sage, and cacti.
 Rolling land covered with loose rocks and exception
 ally dense underbrush, and, on account of the scarcity
 of water and for other reasons more fully explained at
 the end of these notes, exceptionally difficult to sur-
 vey, 80.00 chs.

December, 22, 1909.

December 23; At 8h. 00m., a.m., l.m.t., D set off 35° 07' N. on the lat. arc; 23° 24' S. on the decl. arc and determine a meridian with the solar at the cor. of secs. 13, 18, 19 and 24.

Thence I run
 North bet. secs. 13 and 18.
 Over slightly rolling land covered with loose rocks
 thru exceptionally dense underbrush.
 7.20 Wash, 20 lks. wide, course SW. Over loose rocks,
 14.10 Wash, 100 lks. wide, course SW. Over loose rocks.
 29.32 Road, Kingman to Goldroads, bears NE. and SW.
 30.25, Telephone line, bears NE. and SW.
 40.00 Set a malpais stone, 18x6x6 ins., 12 ins. in the ground,
 for $\frac{1}{4}$ sec. cor., marked $\frac{1}{4}$ on W. face; dig pits, 18x18x12 ins.
 N. and S. of stone, 3 ft. dist.; and raise a mound of earth
 $3\frac{1}{2}$ ft. base, $1\frac{1}{2}$ ft. high, W. of cor.
 40.10 Transmission line, bears NE. and SW.
 41.00 Ascend steep precipitous slope covered with loose
 rocks and boulders.
 63.50 Top of E. end of high ridge, extends W. Desc, steep
 precipitous slope over loose rocks and boulders.
 80.00 Set a malpais stone, 20x12x10 ins., 15 ins. in the ground
 for cor. of secs. 7, 12, 13 and 18; marked with 2 notches
 on N. and 4 notches on S. edge; and raise a mound of
 stone, 2 ft. base, $1\frac{1}{2}$ ft. high, W. of cor. Pits impracticable.
 Land, rolling and mountainous.
 Soil, rocky; 3rd and 4th rate.
 No timber.
 Underbrush, greasewood, sage, and cacti.
 Land mountainous and rolling covered with loose rocks
 and exceptionally dense underbrush, and, in account of
 scarcity of water and other reasons more fully explained
 at the end of these notes, exceptionally difficult to
 survey, 80.00 chs.
 At this cor. I set off 23° 25' S. on the decl. arc and
 observe the sun on the meridian; the resulting lat. is
 35° 08' N.

Thence I run
 North bet. secs. 7 and 12.
 Over slightly rolling land covered with loose rocks
 thru exceptionally dense underbrush.
 36.50 Wash, 20 lks. wide, course W. Over loose rocks.
 40.00 Set a malpais stone, 18x6x6 ins., 12 ins. in the ground, for
 $\frac{1}{4}$ sec. cor., marked $\frac{1}{4}$ on W. face; and raise a mound of

Survey of the East Bdy. of Tp. 20 N., Rg. 18 W.

chains.

stone, 2ft. base, 1½ ft. high, W. of cor. Pits impracticable.
 50.70 Wash, 20 lks. wide, course NW. Over loose rocks.
 53.45 Wash, 20 lks. wide, course NW. Over loose rocks.
 61.35 Wash, 20 lks. wide, course NW. Over loose rocks.
 67.60 Old road, bears NW. and SE.
 80.00 Set a malpais stone, 24x16x8 ins., 18 ins. in the ground
 for cor. of secs. 1, 6, 7 and 12. marked with 1 notch on
 the N. and 5 notches on the S. edge; and raise a mound
 of stone, 2ft. base, 1½ ft. high, W. of cor. Pits impracticable
 Land, slightly rolling.
 Soil, rocky; 3rd rate.
 No timber.
 Underbrush, greasewood and sage.
 Rolling land covered with loose rocks and exception-
 ally dense underbrush, and, on account of the scarcity
 of water and other reasons more fully explained at the
 end of these notes, exceptionally difficult to survey,
 80.00 chs.

Thence I run

North bet. secs. 1 and 6.

Over slightly rolling land covered with loose rocks
 thru exceptionally dense underbrush.

5.60 Wash, 20 lks. wide, course SW. Over loose rocks.
 18.00 Wash, 100 lks. wide, course SW. Over loose rocks.
 24.00 Wash, 200 lks. wide, course SW. Over loose rocks.
 40.00 Set a malpais stone, 15x8x6 ins., 10 ins. in the ground,
 for ¼ sec. cor. marked ¼ on W. face; dig pits, 18x18x12 ins
 W. and S. of stone, 3ft. dist.; and raise a mound of earth
 3½ ft. base, 1½ ft. high, W. of cor.
 45.90 Wash, 20 lks. wide, course SW. Over loose rocks.
 50.90 Wash, 20 lks. wide, course SW. Over loose rocks.
 80.98 Center of Arizona and Utah Ry. track, bears NW. and SE.
 81.80 Telephone line, bears NW. and SE.
 82.10 Intersect the 5th Standard Parallel North at a point
 5.00 chs. W. of the standard sec. cor. on the S. bdy.
 of sec. 31, Tp. 21 N. Rg. 17 W. which is a stone marked and
 witnessed as described by the Surveyor General. I set
 a malpais stone, 24x14x14 ins., 18 ins. in the ground, for
 closing cor. of Tp. 20 N., Rs. 17 and 18 W., marked
 CC 20 N on S.,
 17 W on E., and
 18 W. on W. face; and raise a mound of stone, 2ft.
 base, 1½ ft. high, S. of cor. Pits impracticable.
 Land, slightly rolling.
 Soil, rocky; 3rd rate.
 No timber.
 Underbrush, greasewood, sage and cacti.
 Rolling land covered with loose rocks and exception-
 ally dense underbrush, and on account of the scarcity of
 water and other reasons more fully explained at the end
 of these notes, exceptionally difficult to survey, 82.10 chs
 December 23, 1909.

The Boundaries of T_p. 20 N., R_e. 18 West.

Latitudes, departures, and closing errors.

Line designated	True bearing	Distance	Latitudes		Departures	
			N	S	E	W
S. Rdy. T 20 N., R 18 W.	S 89° 52' E. ...	479.17		1.12	479.17	
E. Bdy. T. 20 N., R. 18 W.	North.	482.10	482.10			
5th Standard Par. N.	West.	478.35				478.35
5th G. Meridian W.	South.	240.00		240.00		
	S 0° 03' W.	40.08		40.08		0.03
	S 0° 06' W.	40.66		40.66		0.07
	South.	160.00		160.00		
Convergency.						0.51
Totals.			482.10	481.86	479.17	478.96
			481.86		478.96	
Error in lat.			0.24	Error in Dep.	0.21	

GENERAL DESCRIPTION

T 20 N., R. 17 W. is rolling land in the W. and mountainous in the East. It is covered with dense underbrush throughout. There is no water in this T_p.

T_p. 20 N., R. 18 W., is rolling and mountainous and covered with dense underbrush. There is no water in this T_p.

In order to obtain water while making this survey, it was necessary to go a distance of 14 miles. The length of this haul, 28 miles to a trip, kept an extra team, wagon and man busy all the time. As it was necessary to make a road from each camp to the road on which the tank we obtained water from was located, and the fact that we had to keep 3 barrels of water on hand for camp use and camp and line teams, it was impossible to move camp to suit the work and I had to work these lines from one camp, making long walks to and from work, and materially cutting down the number of miles run in a day.

Although most of these lines passed over young brush covered with loose rocks, the rocks were not large enough to use for cor. stones, and knowing that the most essential part of a survey, is the establishment of cors. which will not be easily destroyed, I employed an extra man, team and wagon to haul rocks for cors., in preference to setting mounds of earth, with deposits and stake in pit, which would have been easier and cost less, but would have soon been obliterated. The average haul for rocks was 3 miles, and kept the team busy at all times.

The heavy snow fall here in early winter had rotted out the grass, and I was forced to buy and haul hay from Kingman for the extra teams made necessary by the scarcity of water and the hauling of rocks, for the establishment of substantial cors.

The fact that the lines are partly maximum and the other part nearly maximum, far worse than ordinary intermediate, and the extra expenses and troubles incurred in properly executing the survey of these T_p. exteriors have made these lines very exceptionally difficult to survey, and I ask to be allowed these rates.

Fred W. Rodolff
U. S. Deputy Surveyor.

FINAL OATHS OF DEPUTY SURVEYOR AND HIS ASSISTANTS.

LIST OF NAMES

A list of the names of the individuals employed by Fred W. Rodolf

....., United States Deputy Surveyor, to assist in running, measuring, and marking the lines and corners described in the foregoing field notes of the survey of the S. E. & N. Bdy. of T. 19 N., R. 18 West & E. Bdy of T. 20 N. R. 18 W. showing the respective capacities in which they acted:

- A. P. Kerns....., Chainman.
- Bert Lyon....., Chainman.
- Ralph R. Ellis....., Moundman.
-, Moundman.
- R. N. Stark....., Axman.
- P. M. Parker....., Axman.
- George Newell....., Flagman.

FINAL OATH OF ASSISTANTS.

We hereby certify that we assisted Fred W. Rodolf

....., United States Deputy Surveyor, in surveying all those parts or portions of the S. E. and N. Bdy. of Townships 19 North Range 18 West and the East Bdy. of Township 20 North Range 18 West.

..... of the Gila & Salt River Basal meridian, Territory of Arizona, which are represented in the foregoing field notes as having been surveyed by him and under his direction; and that said survey has been in all respects, to the best of our knowledge and belief, well and faithfully surveyed, and the corner monuments established, according to the instructions furnished by the United States Surveyor

General for Arizona.

- A. P. Kerns....., Chainman.
- Bert Lyon....., Chainman.
- Ralph R. Ellis....., Moundman.
-, Moundman.
- R. N. Stark....., Axman.
- P. M. Parker....., Axman.
- George Newell....., Flagman.

Subscribed and sworn to before me this 7 day of March, 1980



W. J. French
Notary Public

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FINAL OATH OF UNITED STATES DEPUTY SURVEYOR.

I, Fred W. Rodolf, United States Deputy Surveyor, do solemnly swear that, in pursuance of a contract received from Frank S. Ingalls United States Surveyor General for Arizona, bearing date of the 10th day of March, 1909, I have well, faithfully, and truly, in my own proper person, and in strict conformity with the instructions furnished by the United States Surveyor General for Arizona, the Manual of Surveying Instructions, and the laws of the United States, surveyed all those parts or portions of North, South and East Boundries of Township 19, North, Range 18 West, and the East Boundries of Township 20 North & Range 18 West.

River Base of the Gila & Salt meridian, in the Territory of Arizona, which are represented in the foregoing field notes as having been surveyed by me, and under my direction; and I do further solemnly swear that all the corners of said survey have been established and perpetuated in strict accordance with the Manual of Surveying Instructions, and the special written instructions of the United States Surveyor General for Arizona and in the specific manner described in the field notes, and that the foregoing are the original field notes of such survey.

Fred W. Rodolf
United States Deputy Surveyor.

Subscribed by said Fred W. Rodolf and sworn to before me }
this 7th day of May, 1900



Frank S. Ingalls
U.S. Deputy Surveyor for Arizona

APPROVAL.

OFFICE OF THE UNITED STATES SURVEYOR GENERAL,

Phoenix Ariz. Aug 18, 1901
The foregoing field notes of the survey of the North South and East Boundaries of T. 19 N. R. 18 West and the East Boundary of T. 20 N. R. 18 W. Gila and Salt River Base and Meridian, Arizona

executed by Fred W. Rodolf U.S. Deputy Surveyor under his contract No. 155, dated March 10, 1909, having been critically examined, and the necessary corrections and explanations made, the said field notes, and the surveys they describe, are hereby approved.

Frank S. Ingalls
United States Surveyor General.

I certify that the foregoing transcript of the field notes of the above-described surveys in _____, has been correctly copied from the original notes on file in this office.

United States Surveyor General.