TOWNSHIP EXTERIORS

Scale 1 inch to 160 chains

This Plat
of the
Principal Base, through Ranges
No. 1. W and Nos 1 and 2 East of the
Copper River Base and Meridian,
in the District of Alaska, is strict-
ly conformable to the field notes
of the survey thereof, by Alfred
B. Lewis, U. S. Deputy Surveyor,
under his Contract, No 3, dated
March 21, 1904, which has been
examined and approved and
filed in this office.

U. S. Surveyor General's Office
Juneau, Alaska.
January 28, 1908

W. L. Distin
U. S. Surveyor General.

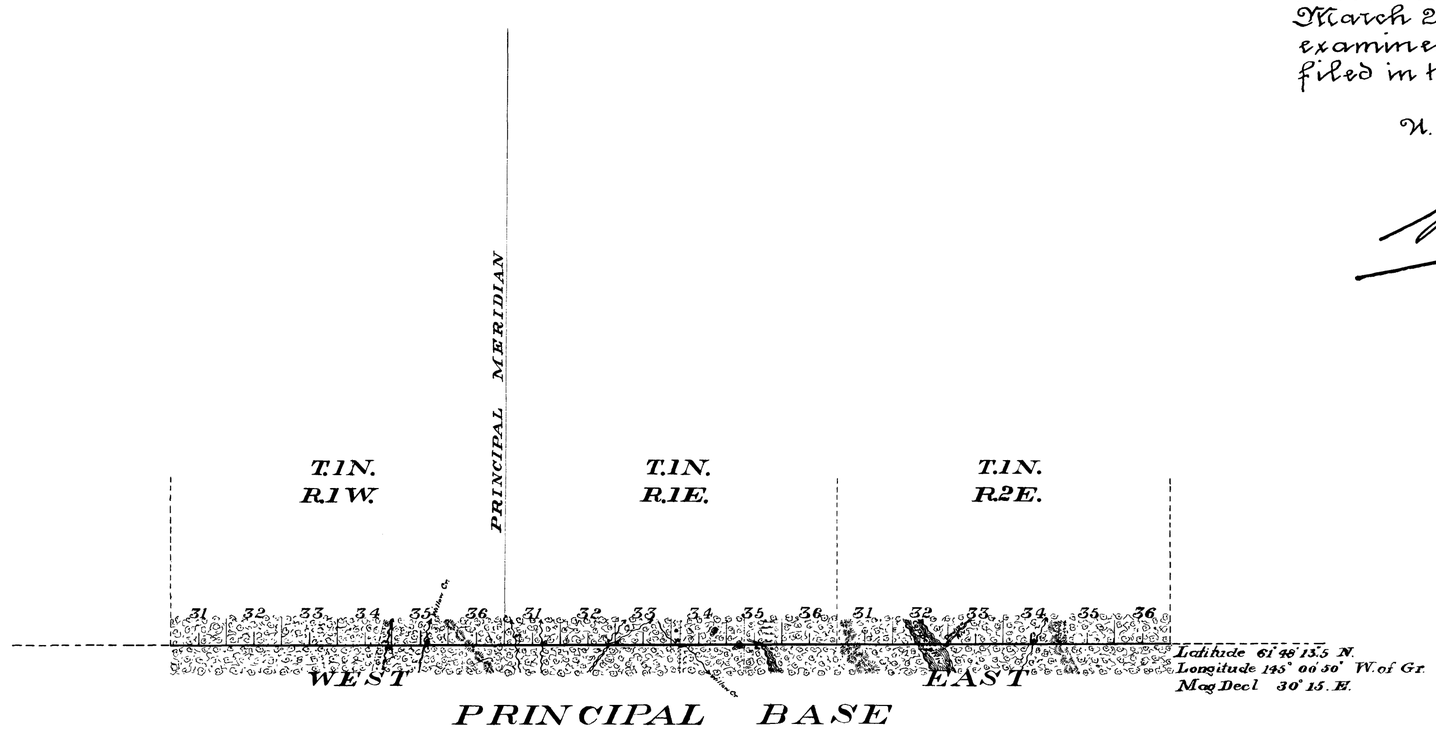


Table of Mileage

Surv's Designated	Amount			When Surveyed.
	Mls	Chs	Lks	
Standard Line	18	00	00	May 8 to 19. 1904

W.P.

TOWNSHIP EXTERIORS

Scale 1 inch to 160 chains

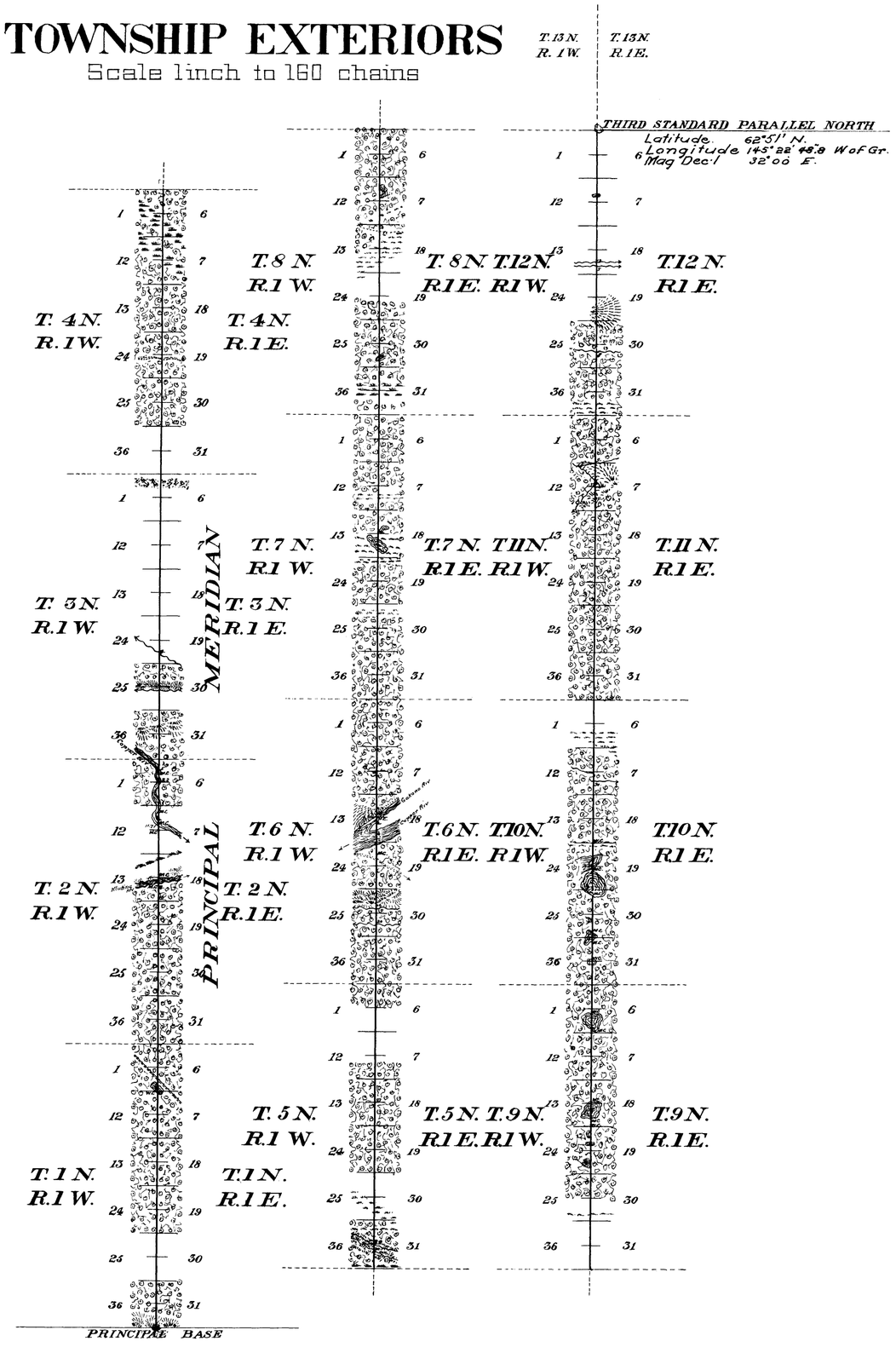


Table of Mileage

Survs designated	Amount			When surveyed.
	mls	chs	lks	
Principal Meridian	72	00	00	April 17 to June 9. 1905

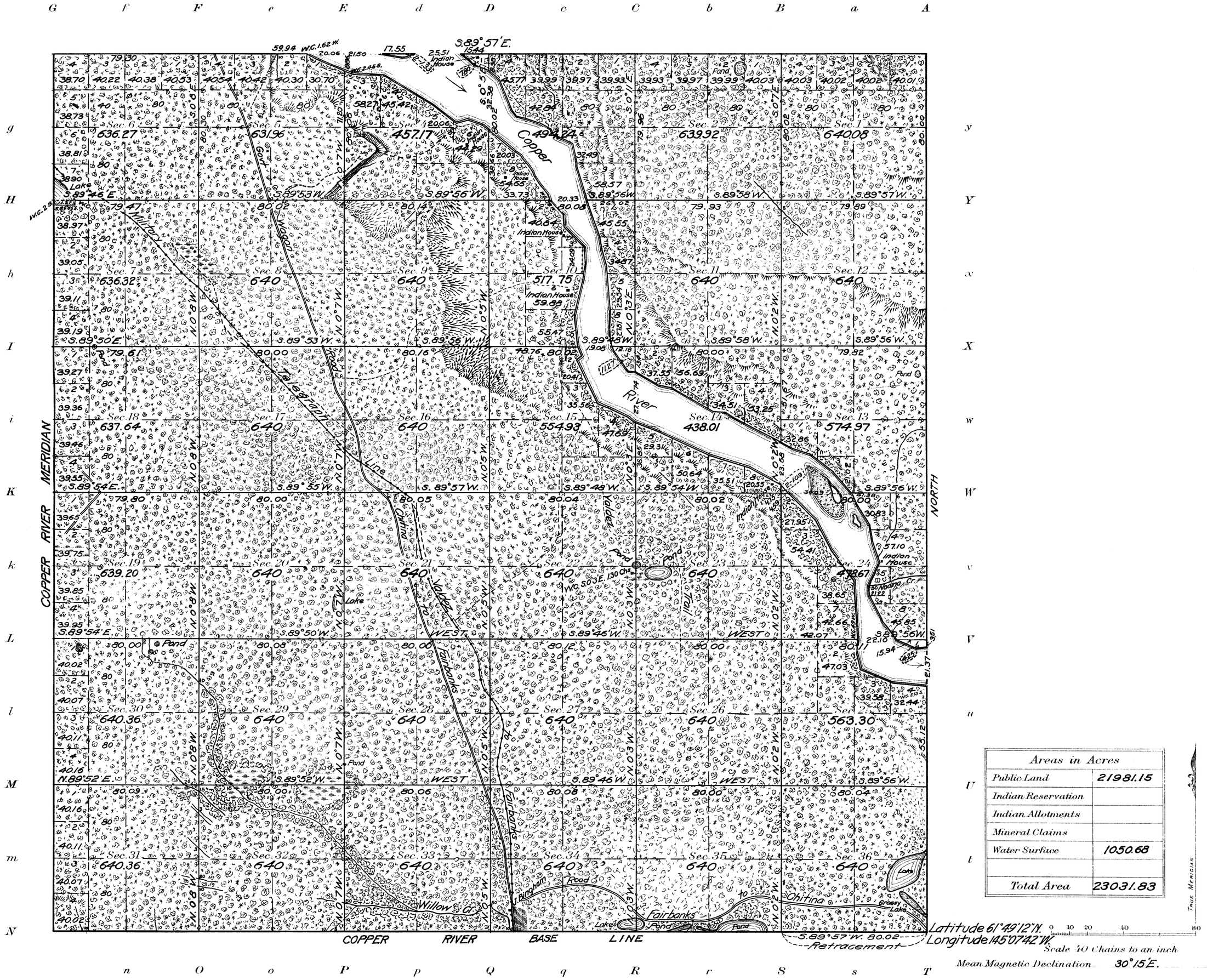
This Plat of the Principal Meridian through Townships Nos 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11 and 12. North, between Ranges No 1 East and No 1. West, of the Copper River Base and Meridian, in the District of Alaska, is strictly conformable to the field notes of the survey thereof, by Alfred B. Lewis, U. S. Deputy Surveyor, under his Contract No 3. dated March 21. 1904, which has been examined and approved, and filed in this office

U. S. Surveyor General's Office.
Juneau, Alaska
January 28, 1908.

W. L. Distin
U. S. Surveyor General.

W.R.

Township No. 1 North Range No. 1 East of the Copper River Meridian, Alaska



Areas in Acres	
Public Land	21981.15
Indian Reservation	
Indian Allotments	
Mineral Claims	
Water Surface	1050.68
Total Area	23031.83

Surveys Designated	By Whom Surveyed	Contract No.	Contract Date	Amount of Surveys Mls.	chs.	lks.	When Surveyed Begun	Completed
Subdivisions	J. Frank Warner	1 ns.	A	22	79	91	May 22, 1911.	July 1, 1911
" "	F. Wilson Williamson			37	00	14	" "	" "
Meanders	J. Frank Warner			5	78	22	" "	" "
" "	F. Wilson Williamson			6	72	19	" "	" "
W. Boundary	Alfred B. Lewis	3	Mch. 21, 1904	6	00	00	April 17, 1905	April 21, 1905
N and E. Boundarys.	J. Frank Warner			11	79	30	May 20, 1911	June 3, 1911
S. Boundary	Alfred B. Lewis	3	Mch. 21, 1904	6	00	00	May 12, 1905	May 13, 1905
Retracement	F. Wilson Williamson			1	00	02	May 22, 1911	May 22, 1911

The above map of Township No. 1 North Range No. 1 East of the Copper River Meridian Alaska is strictly conformable to the field notes of the survey thereof on file in this office, which have been examined and approved.

U. S. Surveyor General's Office.
Juneau, Alaska. March 19 1914.

Charles E. Davidson
Surveyor General.

E.P.K.
Topography F.G.D.
Calculations M.G.

TOWNSHIP EXTERIORS

Scale: 1 inch to 160 chains

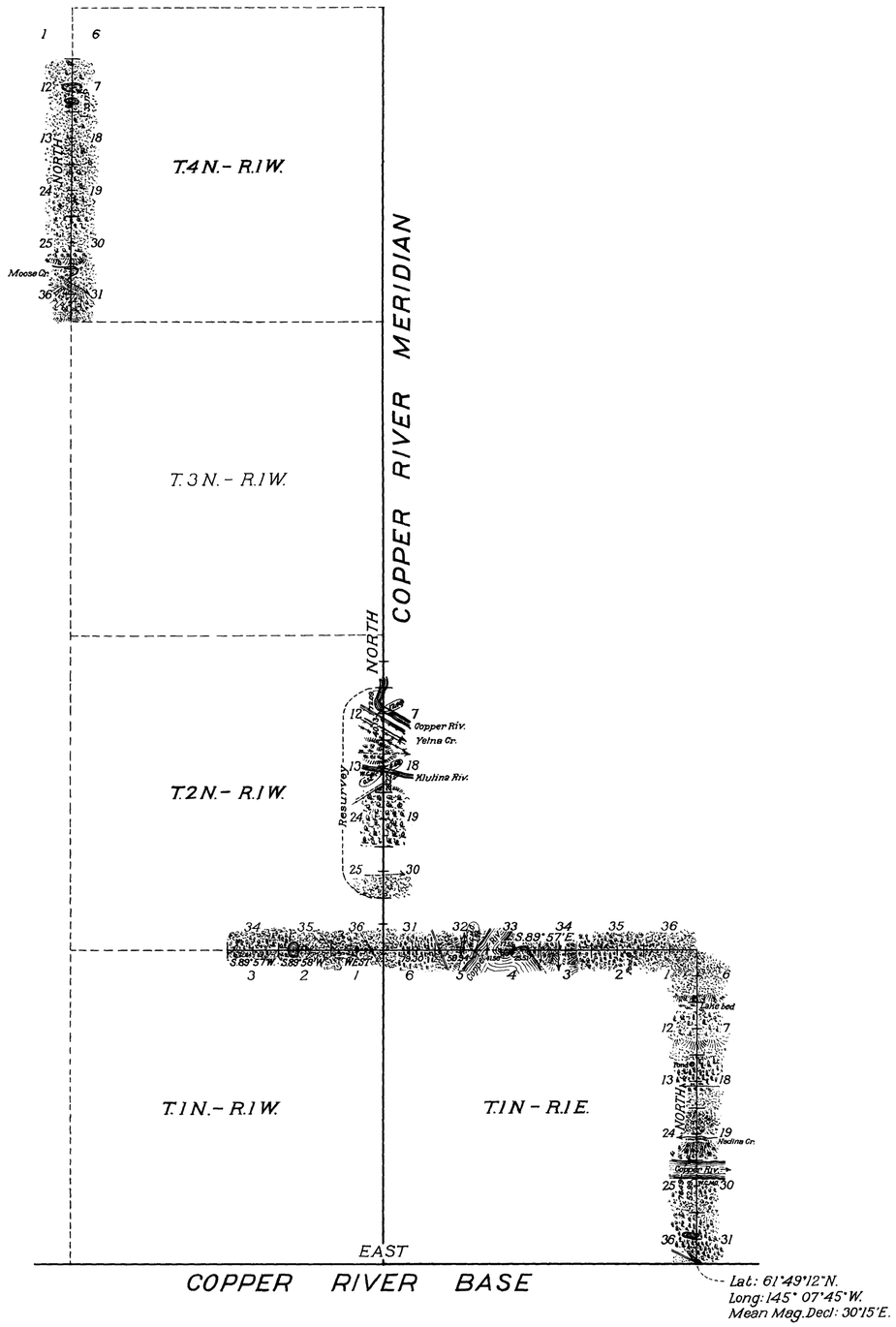


Table of Mileage

Surv's designated	Amount			When surveyed
	Mls.	Chs.	Lks.	
Standard Lines	4	00	00	July 3 to Aug. 8, 1911
Township "	19	79	30	May 20 to Aug. 14, 1911

THIS PLAT

of the

East & North boundaries of T.1N - R.1E.
South & East " " T.2N - R.1W.
West " - T.4N - R.1W.

of the Copper River Principal Base and Meridian in the Territory of Alaska is strictly conformable to the field notes of the survey thereof by

J. Frank Warner, U.S. SURV'R

which have been examined, approved and are on file in this office.

U.S. Surveyor Generals Office
Juneau, Alaska, May 9, 1914

Charles E. Davidson
U.S. Surveyor General

E.T. Orig.

"A"

FIELD NOTES

OF THE SURVEY OF THE

SUBDIVISION AND MEANDER LINES

of

TOWNSHIP No.I NORTH, RANGE No.I EAST.

Of the COPPER RIVER BASE AND *Meridian,*

In the ~~STATE OF~~ ~~DISTRICT~~ Territory of ALASKA

EXECUTED BY

J.FRANK WARNER U.S.SURVEYOR.

F.WILSON WILLIAMSON TRANSITMAN.

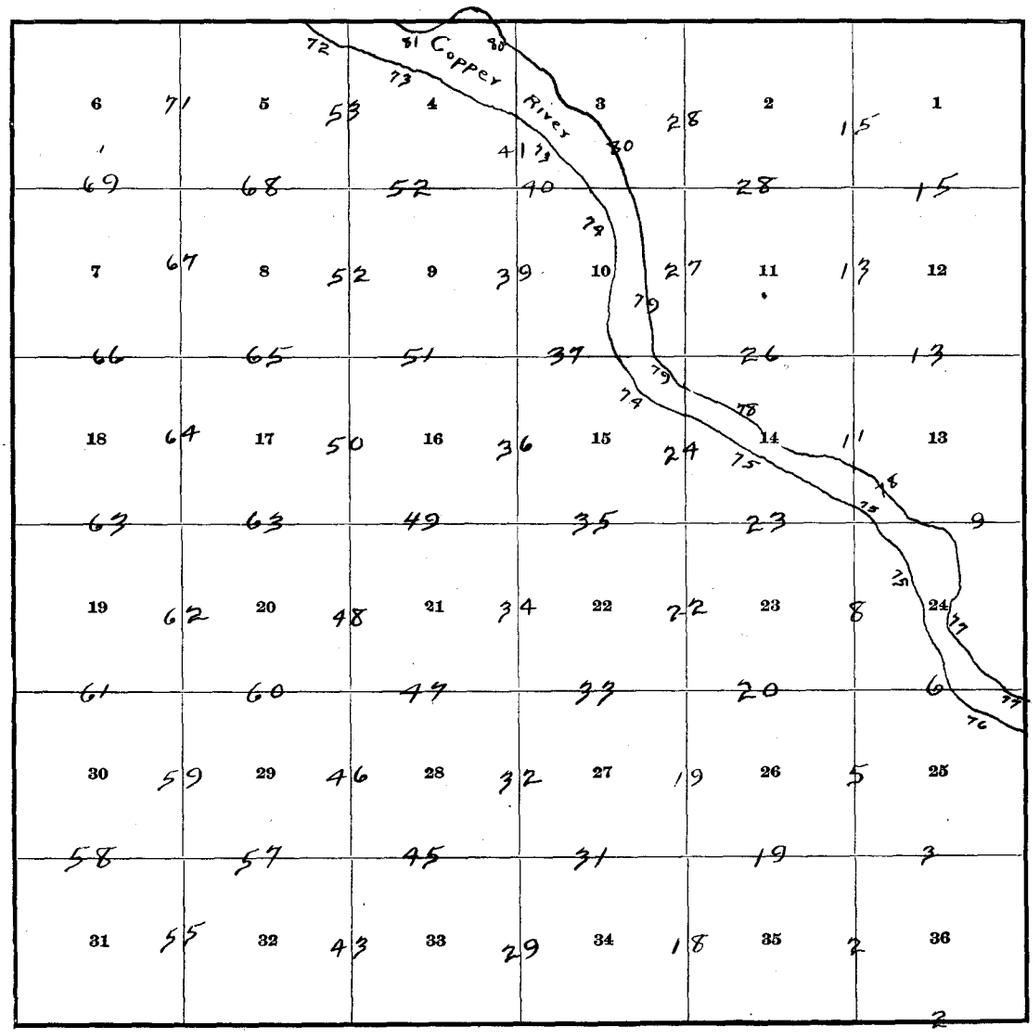
In the chief *capacity* ~~*of U.S. Surveyor*~~, *under instructions dated* APRIL 18, *1911*, ~~*issued by the United States Surveyor General to govern surveys included in Group No.* , *which were*~~ *approved by the Commissioner of the General Land Office,* , *191*, *pursuant to authority contained in the Act of Congress dated* JUNE 25, *1910* and MARCH 4, 1911.

Survey commenced MAY 22, *1911*

Survey completed JULY 1, *1911*

INDEX DIAGRAM.

Township 1 N, *Range* 1 E



6—151

Survey commenced May 22,1911 and executed with a W.& L. E.Gurley,Young & Sons,and Buff & Buff light mountain transits. The horizontal plates of each instrument read by opposite verniers to single minutes of arc, which is also the least count on the vertical circles. The instuments were provided with prism for eye end of telescope,and variation arc.

The adjustments of the transits were carefully verified or corrected. The plate bubbles,line of collimation, height of standards and zero of vertical circles were each given proper attention.

Polaris is not visible at this season of the year.
Measurements taken with sch. steel tape graduated to single links.
Angles of slope taken with clinometer and reduced to Horizontal.

May 22, ~~1911~~ At the cor.secs.31,and 36,T I N R's I and 2 E. I observe the altitude of the suns center as follows, the mean time of the observations being 6 hrs. 44 m. A.M.l.m.t.and solve by the following formula;

$$\cos \tfrac{1}{2} PZS = \sqrt{\frac{\sin \tfrac{1}{2} S \times \sin(\tfrac{1}{2} S - \text{co-decl.})}{\sin \text{co-lat} \times \sin \text{co-alt.}}}$$

where S = co-decl.+ co-lat.+ co-alt.

Longitude 145° 07' 42" W. Lat.61° 49' 12" N.

Altitude

22° 40'	turn to left to hub	36° 00'
23° 02'	turn to left to hub.	36° 41'
23°40'	turn to left to hub	37° 52'
24° 10'	turn to left to hub	38° 48'

Solution of 1st observation.

Declination corrected for change of 4.293 hrs.

Refraction for altitude 2' 11"

Mean time of observation 6 hrs.44 m. A.M.l.m.t.

28°10'48"	co-lat.	a.c.sin	0.325834
67°22'11"	co-alt.	a.c.sin	0.034795
69°44'46"	co-decl.		
2)165°17'45"			
82°38'52"	$\frac{1}{2}$ S	sin	9.996414
69°44'46"			
12°54'06"	$\frac{1}{2}$ S - co-decl.	sin	9.348847
			2)19.705890
			9.852945 =

$\frac{1}{2}$ co-sin 44° 32' 24"
2
89° 04' 48" azimuth of sun from north or
N89° 04' 48" E.course to sun.

~~N.89° 04' 48"~~ E.
36° 00'
N.53° 04'48" E. course to mark,

Ist observation gives course to hub	N.53°04'48"E.
2nd observation gives course to hub	N.53°04'48"E.
3rd observation gives course to hub	N.53°04'58"E.
4th observation gives course to hub	N.53°05'26"E.
Mean of 4 observations	N.53°05'00"E.

The magnetic bearing of the true meridian at 7:00 A.M. is N.30°15'W. The angle thus determined gives the Mag.Decl.30°15'E.

I commence at the standard cor. Tps.I N R'S I and 2 E. which is a granite stone 6 x 10 x 8 ins.above the ground firmly set marked and witnessed as described by the surveyor general.

Thence I retrace West on the Copper river Base line and S.Bdy.sec.36.At 40.01 chs.fall 13½ lks. N.of standard ¼ sec.cor. and at 80.02 chs.fall 7 lks.N.of the standard cor.secs.35 and 36 on S.bdy.Tp. Consequently the S. Bdy.of sec.36 bears S.89°57'W.80.02 chs..

Therefor the bearings as stated by the surveyor general ~~and~~ my chaining practically agrees with the field notes of the original survey.

May 22.1911.

I commence at the standard cor.secs.35 and 36 on the S. bdy.Tp.which is a granite stone 10 x 10 x 5 ins.above ground firmly set marked and witnessed as described by the surveyor general.

Thence I run

N.0°02'W.bet.secs.35 and 36.

Over level land

Through scattering spruce timber and dense undergrowth

16.41 Government wagon road bears S.80°E.and N.80°W. leads from Chitina to Fairbanks.

25.00 Enter heavy spruce timber bears E.and W.

40.00 Set an iron ~~post 3 ft.long 1in.in~~ pipe Size 1 diam.26 ins in the ground for ¼ sec.cor ~~marked on brass cap~~ with cap marked ¼ S 35 on W. half and S 36 on E.half;from which

Subdivision of T.I N,R.I E.

chains

An ~~aspen~~ poplar 10 ins.in diam.bears N.55°E.21 lks.dist.
marked ¼ S 36 B T.
A spruce 5 ins.in diam.bears N.80°W.5 lks.dist.marked
¼ S 35 B T.

80.00 Set an iron ~~post~~ pipe ~~3 ft.long~~ Size 2 ~~2 ins.in diam.~~24 ins.in the
ground for the cor,secs.25,26,35,and 36.marked on
brass cap T I N S 26 in NW.
R I E S 25 in NE.
S 36 in SE.and
S 35 in SW.quadrants;from which
A spruce 5 ins.in diam.bears N.31°E.8 lks.dist.
marked T I N R I E S 25 B T.
A spruce 5 ins.in diam.bears S.55°30'E.13 lks.dist.
marked T I N R I E S 36 B T.
A spruce 5 ins.in diam.bears S.82°30'W.38 lks.dist.
marked T I N R I E S 35 B T.
A spruce 6 ins.in diam.bears N.3°45'W.45 lks.dist.
marked T I N R I E S 26 B T.

Land level.
Soil 1st 15,00 chs.vegetable mold 2 ft.deep light and porous
Remaining 65.00 chs.frozen and covered with moss.
Heavy spruce timber 55.00 chs.
Dense undergrowth of willows 80.00chs.

May 23,1911.

N.89°57'E.on a random line bet,secs.25 and 36.
40.00 Set.temp.¼ sec.cor.
80.04 Intersect E.bdy.of Tp.2 lks.S.of cor.secs.25,30,31and 36.
Thence I run
S.89°56'W.on a true line bet.secs.25 and 36.
Over rolling land.
Through burned timber and dense undergrowth of willows
and young spruce.
7.00 Enter heavy spruce timber bears N.and S.
12.00 Leave heavy spruce timber bears N.and.S.

Subdivision of T.I N.R.I E.

Chains

25.00 Enter heavy spruce timber bears N.and S.

26.00 Leave heavy spruce timber bears N.andS.

35.50 Enter heavy spruce timber bears N.and S.

40.02 Point for ¼ sec.cor.falls in a shallow lake or pond impracticable to establish cor in ~~this~~ frozen ground.

40.27 Set an iron post 3 ft.long 1 ins.in diam.26 ins.in the ground for witness corner to ¼ sec.cor.marked on brass capS 25 On N.half ans S 36 on S.half and W C ¼ on E.

From which

A spruce 12 ins.in diam.bears N.77°W.23 lks.dist. marked W C S 25 ¼ B T.

A spruce 10 ins.in diam.bears S.8°15'E.50 lks.dist. marked W C S 36 ¼ B T.

80.04 The cor secs.25,26,35 and 36.

Land rolling and level.

Soil 1st 7.00 chs.vegetable mold 2 ft.deep light and porous.Remaining 73.04 chs.frozen and covered with moss.

Heavy spruce timber 55.54 chs.

Dense undergrowth of willows and young spruce 80.04 chs.

May 24,1911.

A. Wilson Williamson
U.S. Transitman

June 4,~~1911~~ at the cor.secs.25,26,35 and 36,in latitude 61°50'04"N. longitude 145°09'32 "W. I determine a true meridian as follows;

I observe the altitude of the suns center,the mean time of observations being 5 hrs.02 m.20 sec.P.M.l.m.t.

Altitude

26°12'	turn right to peg	90°08'
25°35'	turn right to peg	89°53'
25°08'	turn right to peg	89°05'
24°41'	turn right to peg	88°10'

Subdivision of T.I N.R.I E.

Chains.

Solution of first observation.

Declination corrected for 14.72 hrs.

Refraction for altitude 1' 50"

28°09'56"	co-lat.	a.c.sin	0.326039
63°49'50"	co-alt.	a.c.sin	0.046968
67°35'12"	co-decl.		
2)159°34'58"			
79°47'29"	½ S.	sin	9.993070
67°35'12"			
12°12'17"	½ S & co-decl.	sin	9.325115
			2)19.691192
			9.845596 =

½ cosin. 45°30'31"
2
91°01'02" azimuth from north.
S.88°58'58"W. course to sun.
90°58' angle bet. sun and mark.
179°56'58"
N.0°03'02"W.

1st observation gives course	N.0°03'02"W.
2nd observation	N.0°01'00"E.
3rd observation	N.0°03' E.
4th observation	N.0°01' E.
Mean of 4 observations	N. 0°0'30" E.

The magnetic bearing of the true meridian is N.30°15'W.

which gives the mag.decl.30°15'E.

All lines deflected from the true meridian and carried

by fore and back sights.

Thence I run

N.0°02'W.bet secs.25 and 26.

Over rolling land.

Through heavy spruce timber and dense undergrowth.

2.00 Leave heavy spruce timber bears E.and W.enter young

growth spruce 6 ft.high and ~~aspen~~ and dense undergrowth.

40.00 Set and iron post 3 ft.long 1 in.in diam.26 ins.in the

ground for ¼ sec.cor.marked on brass cap S 25 on E.

half and ¼ S 26 on W.half;from which

A spruce 8 ins.in diam.bears S.80°E.2.90 chs.dist.

marked ¼ S 25 B T.

An aspen 7 ins.in diam.bears S.54°45'W.1.34 chs.dist.

marked ¼ S 26 B T.

Subdivision of T.I N.,R.I E.

Chains

80.00 Set an iron post 3 ft.long 2 ins.in diam.26 ins.in the ground for cor.secs.23,24,25 and 26. marked on brass cap T I N S 23 in NW.

R I E S 24 in NE.

S 25 in SE.and

S 26 in SW.quadrants;from which

A spruce 8 ins.in diam.bears N.75°35'E.25 lks.dist. marked T I N R I E S 24 B T.

An aspen 8 ins.in diam.bears S.35°00'E.44 lks.dist. marked T I N R I E S 25 B T.

A spruce 9 ins.in diam.bears S.64°45'W.54 lks.dist. marked T I N R I E S 26 B T.

An aspen 10 ins.in diam.bears N.72°20'W.20 lks.dist. marked T I N R I E S 23 B T.

Land nearly level.

Soil vegetable mold 2 ft.deep.

Timber spruce and aspen 80.00 chs.

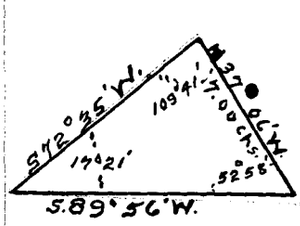
Dense undergrowth 80.00 chs.

June 5,1911.

N.89°56'E.on a random line bet secs.24 and 25.

40.00 Set temp.¼ sec.cor.

42.07 To right bank of Copper River.Set temp.meander cor.



To determine the distance across river I set flag on line on left bank,also leave flag on right bank.

Cross river and run base line N.37°06'W.7.00 chs.

From N.end of base flag on right bank bears S.72°35'W. which gives for triangulation

sin 17°21' : sin 109°41' :: 7.00 chs. : 22.10 chs.

log sin	log sin	log
9.474519	9.973852	0.845098
		9.973852
		10.818950
		9.474519
		1.344431 = 22.10 chs.

distance across river.

Subdivision T.I N,R.I E.

Chains.

also 47.02plus 23.10 =

69.12 Left bank of Copper River.Set temp.meander cor.

80.11 Intersect E.bdy.township at the cor.secs.19,24.25 and 30

Thence I run

S.89°56'W.on a true line bet.secs.24 and 25.

Over level land.

Through heavy aspen timber and dense undergrowth.

15.94 To left bank Copper River. Set a granite stone 15 x 7 x 6 ins.10 ins.in the ground for meander cor.of frac.secs. 24 and 25 marked M C on W face with 2 grooves on S.face. dig pit 36 x 36 x 12 ins.8 ft.E.of stone and raise a mound of earth 4 ft.base 2 ft,high E.of cor.

38.04 Left bank Copper River impracticable to establish M C cor. on account of caving banks.Enter heavy spruce timber and windfalls.bears N.and S.

38.53 Set an iron post 3 ft.long 1 in.in diam.26 ins.in the ground for witness corner to meander cor. frac.secs. 24 and 25,marked on brass cap T I N R I E W C M C on E.half,S 24 in NW. and S 25 in SW. quadrants;from which

A spruce 6 ins.in diam.bears S.5°45'E.82 lks.dist. marked W C T I N R I E S 25 M C B T.

A spruce 6 ins in diam.bears N.56°25'W.62 lks.dist. marked W C T I N R I E S 24 M C.B T.

40.05½ Set an iron post 3 ft.long 1 in.in diam.26 ins.in the ground for ¼ sec.cor.marked on brass cap ¼ S 24 on N. half and S 25 on S half;from which

A spruce 6 ins.in diam.bears S.5°45'E.82 lks.dist. marked ¼ S 25 B T.

A spruce 14 ins in diam.bears N.6°00'E.8 lks.dist. marked ¼ S 24 B T.

41.50 Leave heavy spruce timber bears N.and S.enter dense undergrowth.

42.61 Foot of river bluffs bear N.and S.Ascend east slope.

51.36 Top of river bluffs 440 ft.above river,bear N.and S.

Subdivision of T.I N.R.I E.

Chains

Enter heavy spruce timber bears N.and S.

~~56.00 MT.Wrangell,a smoking volcano bears N.73°15'E.~~

58.00 Leave heavy spruce timber bears N.and S. Thence through dense undergrowth.

~~65.47 MT.Drum bears N.41°46'E.~~

67.86 Enter heavy spruce timber bears N.and S.

80.11 The cor.secs.23,24,25 and 26.

Land level and broken.

Soil 14.94 chs.on E.side river loam 2 ft, 42.07 chs. vegetable mold 1 ft.

Timber spruce and aspen. 15.94 chs.aspen timber and 31.72 chs.spruce timber.

June 6,1911.

N.0°02'W.bet secs.23 and 24.

Over level land.

Through heavy spruce,aspen and cottonwood timber and dense undergrowth and windfalls.

40.00 Set an iron post 3 ft.long 1in.in diam.26 ins.in the ground for ¼ sec.cor.marked on brass cap ¼ S 23 on W. half and S 24 on E.half;from which

An aspen 10 ins.in diam.bears N.31°E.31 lks.dist. marked ¼ S 24 B T.

A spruce 10 ins.in diam.bears N.1°30'W.50 lks.dist. marked ¼ S 23 B T.

45.50 Top of river bluffs bears SE.and N.20°W.Descend.

48.00 Foot Of descent bears N.20°W.and SE. Thence along E.slope in heavy spruce timber.

76.02 Descend abruptly over NE.slope.

80.00 Set a granite stone 13 x 9 x 6 ins. 8 ins.in the ground for the cor.secs.13,14,23 and 24.marked with 1 notch on E.and 3 notches on S.edges;from which

A spruce 8 ins.diam.bears N.44°15'E.15 lks.dist. marked T I N R I E S 13 B T.

A spruce 8 ins.in diam.bears S.48°10'E.13 lks.dist.

Subdivision of T.I N.R.I E.

Chains.

marked T I N R I E S 24 B T.

A spruce 9 ins.in diam.bears S.27°W.5 lks.dist.

marked T I N R I E S 23 B T.

A spruce 14 ins.in diam.bears N.5°30'W.15 lks.dist.

marked T I N R I E S 14 B T.

Land level and broken.

Soil- 45.50 chs.vegetable mold 1½ ft.deep. 34.50 chs.

on an east slope soil practically washed off.

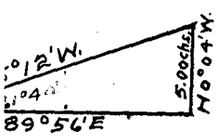
Timber scattering spruce and aspen 48.00 chs.

32.00 chs.heavy spruce timber.

June 7,1911.

N.89°56' E.on a random line bet.secs.13 and 24.

4.59 Right bank of Copper River .Set temp.meander cor. where I leave flag. To determine distance across river I set flag on line across river on gravel banks. Cross river to flag and run base N.0°04'W.5.00 chs.



From N.end of base flag across river on right bank bears S.68°12'W. which gives for triangulation Co-tang.21°44' or 2.50864 x 5.00chs.= 12.54 chs.distance across main channel also 4.59 chs.plus 12.54 chs.=

17.13 To point on gravel bars; thence chaining.

38.62 Left bank Copper River.Settemp.meander cor.

40.00 Set temp.¼ sec.cor.

80.00 Intersect E.bdy.of township at the cor.secs.13,18;19 and24.

Thence I run

S.89°56'W.on a true line bet.secs.13 and 24.

Over level land.

Through heavy spruce timber.

5.00 Leave heavy spruce timber bears N.and S.enter dense undergrowth.

16.88 Creek 6 lks.wide 1 ft.deep,clear water,moderate current muddy bottom,course S.

26.00 Enter heavy spruce timber bears N.and S.

Subdivision of T.I N.R.I E.

Chains

37.49 River bluffs bear NW.and SE. descend in cottonwood timber

40.00 Set an iron post 3 ft.long 1 in.in diam.26 ins.in the ground for ¼ sec.cor.marked on brass cap ¼ S 13 on N. half and S 24 on S.half;from which

A cottonwood 10 ins.in diam.bears N.67°E.36 lks.dist. marked ¼ S 13 B T.

A cottonwood 9 ins.in diam.bears S.86°E.31 lks.dist. marked ¼ S 24 B T.

41.38 Left bank of Copper River 300 ft.below top of bluffs. Set a granite stone 16 x 8 x 8 ins.11 ins.in the ground for meander cor.of fractional secs.13 and 24 marked M C on W.face with 3 grooves on S.face;from which

A cottonwood 6 ins.in diam.bears N.59°E.26 lks.dist. marked T I N R I E S 13 M C B T.

A cottonwood 7 ins.in diam.bears S.74°E.13 lks.dist. marked T I N R I E S 24 B T

49.07 E.side small low island covered at high water enter dense undergrowth . Island extends 5.00chs.NW.and 2.00 chs. SE.

51.85 W.side of island bears SE.and NW. Thence over bare gravel bars.

62.87 Main river channel Copper River course SE.

75.41 Right bank of Copper River banks 12 ft.high. Set an irom post 3 ft.long 1 in.in diam.26 ins.in the ground for meander cor.of frac.secs.13 and 24,marked on brass cap T I N R I E M C on E half, S 24 in SE. and S 13 in NW.quadrants;from which

A spruce 8 ins.in diam.bears N.27°45 'E.24 lks.dist.m marked T I N R I E S 13 M C B T.

A spruce 9 ins.in diam.bears S.17°15'W.20 lks.dist. marked T I N R I E S 24 M C B T.

Ascend NE.slope in heavy spruce timber and dense undergrowth.

80.00 The cor.secs.13,14,23 and 24.

Subdivision of T.I N.R.I E.

Chains

Land level.and broken.

Soil - 37.49 chs.in east half ,good soilblack loam 2 ft. deep. No soil on river bluffs.

Timber- spruce 21.08 chs. Cottonwood and aspen 3.89 chs.

Dense undergrowth 43.65 chs.

June 8,1911.

N.0°02'Wbet.secs.13 and 14.

Descend N.slope through heavy spruce timber,.

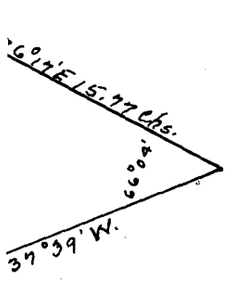
3.00 Leave heavy spruce timber bears NW.and SE. at foot of descent bears E.and W. Thence over level land through dense undergrowth.

4.75 Right bank Copper River. Set a granite stone 15 x 9 x 8ins. 10 ins.in the ground for meander cor.of frac.secs.13 and 14 marked M C on N.face with 1 groove on E.face;from which

A spruce 11 ins.indiam.bears S.0°23'E.2.60chs.dist. marked T I N R I E S 13 M C B T.

A spruce 5 ins.in diam.bears S.22°20'W.2.82 chs.dist. marked T I N R I E S 14 M C B T.

To determine distance across river Set flag on left bank,cross river and run base line S.76°17'E.15.77 chs. from SE.end of base flag on right bank ~~on~~ M C bears S.37°39'W. which gives for triangulation



Sin 37°41' : sin 66°04' :: 15.77 chs. ; 23.58 chs.

log sin		log sin		log.
9.786252	:	9.960955	::	1.197832
				9.960955
				11.158787
				9.786252
				1.372535 = 23.58 chs.distance

across river; 23.58 chs.~~plus~~ 4.75 chs.~~making~~

28.33 Set a granite stone 18 x 12 x 6 ins.12 ins.in the ground for meander cor.of frac.secs.13 and 14,marked M C on S. face with 1 groove on E.face;from which

A spruce 13 ins.in diam.bears N.70°15'E.26 lks.dist.

Subdivision of T.I NR.I E.

Chains. marked T I N R I E S 13 M C B T.

A spruce 10 ins.in diam.bears N.44°15'W.29 lks.dist.

marked T I N R I E S 14 M C B T.

Enter heavy spruce and cottonwood timber,dense undergrowth bears S.76°E.and N.76°W. Ascend steep slope.

29.58 Indian trail on top of bluff bears N.76°W.and S.76°E. 40 ft.above river.Thence over level land through heavy spruce and aspen timber ~~and~~ dense undergrowth

33.88 Foot of bluff bears NW.and SE.Ascend.

37.05 Top of bluff 100 ft.above flat bears NW.and SE. Thence over level land.

40.00 Set an iron post 3 ft.long 1 in.in diam.26 ins.in the ground for ¼ sec.cor.marked on brass cap ¼ S 14 on W.half and S 13 on E.half;from which

An aspen 9 ins.in diam.bears N.28°E.21 lks.dist. marked ¼ S 13 B T.

A spruce 20 ins.in diam.bears S.31°30'W.28lks.dist. marked ¼ S 14 B T.

55.00 Foot of bluff bears NW.and SE. Ascend.

55.90 Top of bluff bears NW.and SE. 30 ft.high.

69.25 Leave aspen and enter heavy spruce timber bears SE.and NW.

80.00 Set an iron post 3 ft.long 2 ins.in diam.24 ins.in the ground for cor.secs.11,12,13 and 14.marked on brass cap

T I N S 11 on NW.

R I E S 12 in NE.

S 13 in SE.and

S 14 in SW.quadrants;from which

A spruce 16 ins.in diam.bears N.40°E.31 lks.dist. marked T I N R I E S 12 B T.

A spruce 8 ins.in diam.bears S.12°E.10 lks.dist marked T I N R I E S 13 B T.

A spruce 7 ins.in diam.bears S.40°45'W.38 lks.dist. marked T I N R I E S 14 B T.

A spruce 6 ins.in diam.bears N.40°15'W.31 lks.dist. marked T I N R I E S 11 B T.

Subdivisionof T.I N,R.I E.

Chains Land lying on terrace is nearly level.

Soil - Part south of river stony scant soil. Part north of river sandy loam loose and friable.

Timber- Aspen,spruce and cottonwood 80.00 chs.
Dense Undergrowth 53.42chs.

June 14 1911.

N.89°56 'E.on a random line bet.secs.12 and 13.

40.00 Set temp. ¼ sec.cor..

79.82 Intersect E.bdy.of township at the cor.secs. 7,12,13 and 18

Thence I run

S.89°56'W.on a true line bet.secs.12 and 13

Over level land.

Through heavy young spruce timber and swamp willows.

39.91 Set an iron post 3 ft.long 1 in.in diam.26 ins.in the ground for ¼ sec.cor.marked on brass cap ¼ S 12 on N. half and S 13 on S.half;from which

A cottonwwod 9 ins.diam.bears S.62°W.15 lks.dist. marked ¼ S 13 B T.

A spruce 5 ins.in diam.bears N.9°W.22 lks.dist. marked ¼ S 12 B T.

79.82 The cor.secs.11,12,13 and 14.

Land level;

Soil vegetable mold,1 ft.deep covered with moss,land frozen throughout the year.

Timber 79.82 chs. heavy spruce.

Dense undergrowth 79.82 chs.

June 15,1911.

N.0°02'W.bet.secs.11 and 12.

Over level land.

Through heavy spruce timber and dense undergrowth.

39.00 Foot of terrace bears E.and W. ascend gradually.

Leave heavy spruce timber bears E.and W.

Subdivision of T.I N,R.I E.

Chains

40.00 Set an iron post 3 ft.long 1 in.in diam.26 ins.in the ground for ¼ sec.cor.marked on brass cap ¼ S 11 on W. half and S 12 on E.half;from which

An aspen 11 ins.in diam.bears N.62°30'E.15 lks.dist. marked ¼ S 12 B T.

An aspen 16 ins.in diam.bears S.50°45'W.56 lks.dist. marked ¼ S 11 B T.

41.00 Top terrace 80 ft.high bears E.and W. Thence over level Land.

75.00 Creek 5 lks.wide 1 ft.deep clear water,sluggish current course SE.

80.00 Set an iron post 3 ft.long 2 ins in diam.24 ins.in the ground for cor.secs.1,2,11 and 12 marked on brass cap.

T I N S 2 in NW.

R I E S 1 in NE.

S 12 in SE.and

S 11 in SW.quadrants;from which

A spruce8 ins.in diam.bears N.35 °E.22 lks.dist. marked T I N R I E S 1 B T.

A spruce 6 ins.in diam.bears S.4°45'E.17 lks.dist. marked T I N R I E S 12 B T.

A spruce 8 ins.in diam.bears S.75°W.60 lks.dist. marked T I N R I E S 11 B T.

A spruce 7 ins.in diam.bears N.80°15'W.21 lks.dist.ma marked T I N R I E S 2 B T.

Land nearly level.

Soil-S.½ vegetable mold 1½ ft.deep.

N ½ frozen and moss covered.

Timber-Aspen and spruce 39.00 chs.

Dense undergrowth 80.00 chs.

June 20,1911.

Subdivision of T.I N,R.I E.

Chains.

N.89°56'E. on a random line bet.secs.1 and 12.

40.00 Set temp.¼ sec.cor.

79.89 Intersect E.bdy.of ~~the~~ township 2½ lks.N.of the cor.secs. 1,6,7 and 12.

Thence I run

S.89°57'W.on a true line bet.secs.1 and 12.

Over rolling land.

Through heavy spruce and aspen timber ~~and~~ dense undergrowth.

38.00 Leave heavy spruce and aspen timber,enter scattering spruce, aspen timber bears SE.and NW.

39.94½ Set an iron post 3 ft.long 1 in.in diam.36 ins.in the ground for ¼ sec.cor.marked on brass cap ¼ S 1 on N.half and S 12 on S.half;from which

A spruce 6 ins.in diam.bears S.85°E.33 lks.dist. marked ¼ S 12 B T.

A spruce 8 ins.in diam.bears N.40°W.3 lks.dist. marked ¼ S 1 B T.

79.89 The cor.secs.1,2,11 and 12.

Land rolling.

Soil- east half covered with moss,frozen land.

West half loam 1 ft.deep.

Timber - Spruce,aspen and cottonwood 38.00 chs.

Scattering spruce ~~aspen~~ and cottonwood.

Dense undergrowth 80.00 chs.

June 21, 1911.

N.0°02'W.on a random line bet.secs.1 and 2.

40.00 Set temp.¼ sec.cor.

80.02 Intersect N.bdy.township 12.1ks.E.of the cor.secs.1 , 2, 35 and 36.

Thence I run

S.0°07'E.on a true line bet secs. 1 and 2.

Over level land.

Subdivision of T. I N.,R. I E.

Chains.

Through dead spruce timber and windfalls,and dense undergrowth.

22.00 Enter green spruce and birch timber bears E.and W.

June 21, 1911.

32.00 Leave green spruce timber bears E.and W.

~~33.00 Mount Hood bears N.48°08'E.~~

40.02 Set an iron post 3 ft.long 1 in.in diam.26 ins.in the ground for ¼ sec.cor.marked on brass cap ¼ S 2 on W. half and S 1 on E.half;from which

A spruce 8 ins.in diam.bears S.59°45'E.2.00 chs.dist. marked ¼ S 1 B T.

A spruce 7 ins.in diam.bears N.47°30'W.85 lks.dist. barked ¼ S 2 B T.

42.00 Enter heavy spruce timber and dense undergrowth bears E.and W.

80.02 The cor.secs.1., 2 , 11 and 12.

Land nearly level.

Soil vegetable mold,1 ft.deep,light and porous.

Timber - Spruce , aspen.and birch 48.02 chs.

Dead spruce, windfalls and dense undergrowth 38.00 chs.

June 22, 1911.

J. Frank Wanner,

U.S.SURVEYOR.

Subdivision of T. I N, R. I E.

Chains.

May 25, ~~1911~~ at the standard corner secs.34 and 35 on base line, which is a granite stone 14 x 11 x 6 ins. firmly set marked and witnessed as described by the surveyor general, I determine a true meridian by direct observation on the suns center .

Mean time of the observations ~~being~~ 6 hrs.55 m.58 secs.

A.M.l.m.t.

Altitude

24°29'	turn right to peg	88°42'
25°13'	turn right to peg	87°18'
25°53'	turn right to peg	85°53'

Solution of first observation.

Declination corrected for 4.61 hrs.

Refraction for altitude 2'00"

Latitude 61° 49' 12"N. Longitude 145° 11' 22"W.

28°10'48"	co-lat.	a.c.sin	0.325834
65°33'00"	co-alt.	a.c. sin	0.040805
69°09'57"	co-decl.		
2)162°53'45"			
81°26'52"	½ S	sin ½ S	9.995144
69°09'57"			
12°16'55"	½ S - co-decl.	sin	9.327824
			2)19.689607
			9.844803 =

½ co-sin 45°36'04"
2
91°12'08" azimuth from the north.
S.88°47'52"E.course to sun.
88°42'00" angle bet.sun and peg.
S.0° 05'52"E.bearing to peg.

Ist observation gives course	S.0°05'52"E.
2nd observation gives course	S.0°05'32"E.
3rd observation gives course	S.0°05'44"E.
Mean of 3 observation gives	S.0°05'43"E.

All lines deflected from the true meridian and carried by fore and back sights.

The magnetic bearing of the true meridian at 7:15 A.M. is N.30°15'W. The angle thus determined gives the mag.decl.30°15'E.

Subdivision of T.I N.,R.I E.

Chains.

Thence I run

N.0°03'W.bet.secs.34 and 35.

Over level land.

Through dense undergrowth.

.95 Edge of shallow pond bears E.and W.

To determine dist.~~across~~ pond I set flag across pond on line. Run base N.89°57'E.4.00 chs. From E.end ofbase flag across pond bears N.30°36'W. which gives for triangulation co-tang 30°36' or 1.69091 x 4.00 chs.= 6.76 chs. distance across pond ~~plus~~ .95 chs. ~~makes~~

7.71 North side of pond bears E.and W. extends E.about 5 chs. and W.10 chs. with a continuation of ponds about ½ mile all of which are partly drained,and hay cut along the shores.

9.04 Government wagon road leads from Chitina to Fairbanks, bears NW.and SE. Enter burned timber bears NW.and SE.

40.00 Set an iron post ~~3 ft.long 1 in.in diam.~~26 ins.in the ground for ¼ sec.cor.marked on brass cap ¼ S 34 on W. half and S 35 on E.half; Dig pits 18 x 18 x 12 ins. N.and S.of~~post~~.3 ft.dist.and raise a mound of earth 3½ ft.base 1½ ft.high W.of cor. Trees all killed by fire.

59.00 Leave burned timber enter green spruce and dense undergrowth. bears E.and W.

80.00 Set an iron post 3 ft.long 2 ins.in diam.24 ins.in the ground for the cor.secs.26, 27, 34 and 35. marked on brass cap T I N S 27 in NW.

R I E S 26 in NE.

S 35 in SE and

S 34 in SW.quadrants;from which

A cottonwood 10 ins.diam.bears N.81°45'E.55 lks.dist. marked T I N R I E S 26 B T.

A spruce 10 ins.in diam.bears S.57°45'E.28 lks.dist. marked T I N R I E S 35 B T.

An aspen 11 ins.in diam.bears S.13°15'W.63 lks.dist. marked T I N R I E S 34 B T.

Subdivision of T.I N,R.I E.

Chains.

A spruce 18 ins.in diam.bears N.85°45'W.14 lks.dist.
marked T I N R I E S 27 B T.

Land level.

Soil - in first 64.00 chs.is loam,vegetable mold 1½ ft.
deep loose and friable;last 16 chs.covered with moss
frozen land.

Timber - heavy spruce,aspen and cottonwood 16.00 chs.
Burned timber 49.96 chs.

May 25, 1911.

East on a random line bet.secs.26 and 35.

40.00 Set temp.¼ sec.cor.

80.00 Intersect N.and S.line at the cor.secs.25, 26, 35 and 36.

Thence I run

West on a true line bet.secs.26 and 35.

Over level land.

Through heavy spruce and aspen timber and dense undergrowth.

40.00 Set an iron post 3 ft.long 1 in.in diam.26 ins.in the
ground for ¼ sec.cor.marked on brass cap ¼ S 26 on N.
half and S 35 on S.half;from which
An aspen 5 ins.in diam.bears S.14°30'E.45 lks.dist.
marked ¼ S 35 B T.
An aspen 5 ins.in diam.bears N.1°30'W.47 lks.dist.
marked ¼ S 26 B T.

80.00 The cor.secs.26, 27, 34 and 35.

Land level.

Soil cold and wet,6 ins.vegetable mold,frozen land.

Timber - Spruce and aspen. 80.00 chs.

May 26,1911.

N.0°03'W.bet.secs.26 and27.

Over level land.

Through heavy spruce timber and dense undergrowth,with few
scattering cottonwood and aspen timber.

40.00 Set an iron post 3 ft.long 1in.in diam.26 ins.in the

Subdivision of T.I N,R.I E.

Chains.

ground for ¼ sec.cor. marked on brass cap ¼ S 27 On W. half and S 26 on E.half;from which

A cottonwood 6 ins.in diam.bears N.54°30'E.66 lks.dist. marked ¼ S 26 B T.

A N aspen 4 ins.in diam.bears N.71°45'W.36 lks.dist. marked ¼ S 27 B T.

80.00 Set an iron post 3 ft.long 2 ins.in diam.24 ins.in the ground for the cor,secs.22, 23, 26 and 27,marked on brass cap T I N S 22 in NW.

R I E S 23 in NE.

S 26 in SE.and

S 27 in SW.quadrants;from which

A spruce 8 ins.in diam.bears N.28°E.56 lks.dist. marked T I N R I E S 23 B T.

A spruce 8 ins.in diam.bears S.26°E.17 lks.dist. marked T I N R I E S 26 B T.

A spruce 8 ins.in diam.bears S.67°W.28 lks.dist. marked T I N R I E S 27 B T.

A spruce 10 ins.in diam.bears N.75°W.27 lks.dist. marked T I N R I E S 22 B T.

Land level.

Soil vegetable mold 1 ft.deep,cold,wet and frozen land, on glacial deposit.

Timber °- Spruce , scattering cottonwood and aspen 80.00 chs.

Dense undergrowth. 80.00 chs.

June 5, 1911

East on a random line bet.secs.23 and 26.

40.00 Set temp.¼ sec.cor.

80.00 Intersect N.and S.line at the cor.secs. 23, 24, 25 and 26.

Thence I run

West on a true line bet.secs.23 and 26.

Over level land.

Through heavy spruce timber and dense undergrowth.

Subdivision of T.1 N.R.1 E.

Chains.

40.00 Set an iron post 3 ft.long 1 in.in diam.26 ins.in the ground for ¼ sec.cor.marked on brass cap ¼ S 23 on N. half and S 26 on S.half;from which

A spruce 7 ins.in diam.bears N.20°E.36 lks.dist. marked ¼ S 23 B T.

A spruce 16 ins.in diam.bears S.10°W.7 lks.dist. marked ¼ S 26 B T.

55.00 Old trail leads from Valdez to Copper Center bears N.and S.

80.00 The cor.secs.22, 23, 26 and 27.

Land level.

Soil- cold and wet about 1 ft.deep of vegetable mold on glacial mud.

Timber - Spruce average size 8 ins.80.00 chs.

June 6, 1911.

A. H. Wilson Williamson
Transitman

June 9, ~~1911~~ at the cor.secs.22, 23, 26 and 27 to determine a true meridian I observe the altitude of the suns center and solve by the formula

$$\text{Cos-sin } \tfrac{1}{2} PZS = \sqrt{\frac{\sin \tfrac{1}{2} S \times \sin(\tfrac{1}{2} S - \text{co-decl.})}{\sin \text{co-alt.} \times \sin \text{co-lat.}}}$$

Where S = co-decl. + co-alt. + co-lat.

In latitude 61°51'16"N. Longitude 145°11'22"W.

Mean time of observations ~~being~~ 8 hrs.10 m.13 secs.A.M. l.m.t.

Altitude

34°55'	turn right from sun to hub	72°30'
35°21'	turn right from sun to hub	71°33'
35°52'	turn right from sun to hub	70°24'

Solution of first observation.

Declination corrected for 5.85 hrs.

Refraction for altitude 1'15".

Subdivision of T.I N,R.I E.

Chains

28°08'44" co-lat.		a.c.sin	0.326322
55°06'15" co-alt.		a.c.sin	0.086084
67°06'41" co-decl.			
2)150° 21'40"			
75°10'50"	½ S	sin	9.985308
67°06'41"			
8°04'09"	½ S - codecl.	sin	9.147269
			2)19.544983
			9.772491 =

½ co-sin 53°41'04"
2
107°22'08" azimuth of sun from north.
S.72°37'52"E.course to sun.
72°30' angle bet.sun and hub.
S. 0°07'52"E.course to hub.

Lst.observation gives course to hub	S.0°07'52"E.
2nd gives course to hub	S.0°07'56"E.
3rd gives course to hub	S.0°08'00"E.
Mean of 3 observations	S.0°07'56"E.

The magnetic bearing of the true meridian at 8:30 A.M. is N.30°15'W.which gives the mag.decl.30°15'E.

All lines deflected from the true meridian and carried by fore and back sights.

Thence I run

N.0°03'W.bet.secs.22 and 23.

Over level land.

Through heavy spruce timber and dense undergrowth.

33.00 Leave heavy spruce timber , enter swampy land covered dense undergrowth.bears E.and W.

36.00 Leave swampy land enter heavy spruce timber bears E.and W.

A circular pond bears east 5.00 chs.dist.Pond about 15 chs.~~across~~ long,shallow with low banks.

38.70 On edge of pond bears E.and W. ¼ sec.cor.falls in the pond.Set an iron post 3 ft.long 1 in.in diam.26 ins. in the ground for witness corner to ¼ sec.cor.marked on brass cap W C ¼ S 22 on W.half and S 23 on E.half;

From which

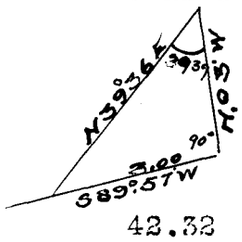
A birch 14 ins.in diam.bears S.77°50'E.30 lks.dist. marked ¼ S 23 W C B T.

A spruce 12 ins.diam.bears S.77°50'W.35 lks.dist. marked ¼ S 22 W C B T.

To determine distance across pond I set flag on line

Subdivision of T.I N.R.I E.

Chains across pond on N.bank. Run base S.89°57'W.3.00 chs.



dist. From West end of base flag across pond N.39°36'E. ~~Then~~ co-tang.39°39'or 1.20665 x 3.00 chs. 3.62 chs. distance across pond ~~plus~~ 38.70 chs. ~~making~~

42.32 North bank of circular pond .Enter heavy spruce and cottonwood timberand dense undergrowth bears E.and W.

56.00 Old trail leads from Valdez to Copper Center bears E.and W.

80.00 Set an iron post 3 ft.long 2 ins.in diam.26 ins.in the ground for cor.secs.14, 15, ~~21~~ 22 and ~~22~~ 23.marked on brass cap T I N S 15 in NW.

R I E S 14 in NE.

S 23 in SE.and

S 22 in SW.quadrants; from which

A spruce 7 ins.in diam.bears N.26°15'E.27 lks.dist. marked T I N R I E S 14 B.T.

A spruce 10 ins.in diam.bears S.53°45'E.10 lks.dist. marked T I N R I E S 23 B T.

A spruce 9 ins.in diam.bears S.65°45'W.33 lks.dist. marked T I N R I E S 22 B T.

A spruce 9 ins.in diam.bears N.21°W.10 lks.dist. marked T I N R I E S 15 B T.

Land level.

Soil -Vegetable mold L ft.deep on glacial deposit.

Timber - Spruce, aspen, and cottonwood 8 to 10 ins. in diam.73.88 chs.

Dense undergrowth 76.38 chs.

June 9, 1911.

East on a random line bet.secs.14 and 23..

40.00 Set temp.¼ sec.cor.

80.02 Intersect N.and S. line 15 lks.S.of the cor.secs.13, 14, 23 and 24.

Thence I run

S.89°54'W.on a true line bet.secs.14 and 23.

Over hilly and broken land,ascending east slope.

Through heavy spruce timber.

Subdivision of T.1.N.R.1 E.

Chains.

2.20 Top of ascent ~~falls~~ N.Descend ~~on~~ N.slope.

5.60 Dry ravine course NE.Ascend SE.slope.in scattering cottonwood timber ,banks steep,no soil.

11.20 Same dry ravine, ~~and~~ follow up in channel.

13.00 Leave.bed of.ravine ~~comes~~ from NW.enter heavy.spruce timber bears SE.and NW.

20.00 Same dry ravine course SE.Leave heavy spruce timber bears NW.and SE. Ascend abruptly SE.slope,no soil.

22.68 Top of bench,60 ft.above ravine bears NW.and SE.Enter dead scattering spruce timber and dense undergrowth.

30.00 Enter heavy spruce timber.bears N.and S.

40.01 Set an iron post 3 ft.long 1 in.in diam,26 ins.in the ground for ¼ sec.cor. marked on brass cap ¼ S 14 on N. half and S 23 on.S.half; from which

A spruce 9 ins.in diam.bears N.1°E.11 lks.dist. marked ¼ S 14 B T.

A spruce 9 ins.in diam.bears S.28°30'E.36 lks.dist. marked¼ S 23 B T.

55.60 Creek 1 lk.wide course NW. Pure clear water. Muddy bottom.

80.02 The cor.secs.14, 15, 22 and 23.

Land broken and rolling.

Soil vegetable mold,1 ft.deep on glacial deposit.

Timber - Spruce 64.62 chs.

Dense undergrowth 57.34 chs.

June 10, 1911.

N.0°03'W.bet.secs.14 and 15.

Over level land.

Through heavy spruce,cottonwood and aspen timber and dense undergrowth.

18.22 Descend abruptly.

21.00 Bottom of ravine course NE.ascend SE.slope.

24.51 Top of ascent on N.side ravine bears NE.and SW. Thence over level land.

Subdivision of T.I N.R.I E.

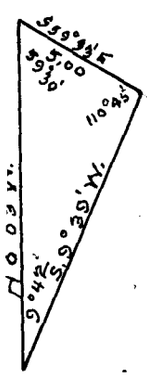
Chains.

31.20 To river bluff, bears NW. and SE. Leave heavy spruce timber and descend abruptly on NE. slope, devoid of soil or vegetation.

38.85 Right bank of Copper River. Set a granite stone 16 x 12 x 6 ins. 11 ins. in the ground for meander corner of frac. secs. 14 and 15, marked M C on N. face with 2 grooves on E. face and raise a mound of stone 2½ ft. base 1½ ft. high S. of cor. Pit impracticable. ¼ sec. cor. falls in river.

June 15, 1911.

To determine distance across river I set flag on Left bank and leave flag on M C. Cross to left bank and run base line S.59°33'E. 5.00 chs. From east end of base flag across river on M C bears S.9°39'W. which gives for triangulation



sin 9°42' : sin 110°48' :: 5.00 chs. : 27.74 chs.

log sin : log sin :: log 5.00

9.226573 : 9.970731 :: 0.698970
9.970731
10.669701
9.226573
1.443128 = 27.74 chs. dist.

across Copper River plus 38.85 chs. ~~making~~

66.59 ~~To~~ left bank of Copper RIver. Set a granite stone 15 X 8 x 6 ins. 10 ins. in the ground for meander corner to fractional secs. 14 and 15, marked M C on south face with 2 grooves on E. face. Raise a mound of stone 2½ ft, base 1½ ft. high N. of cor. Pit impracticable.

Thence through dense undergrowth bears NW. and SE.

71.50 Enter heavy spruce timber bears NW. and SE.

76.28 Indian trail follows Copper River bears NW. and SE.

80.00 Set an iron post 3 ft. long 2 ins. in diam. 24 ins. in the ground for cor. secs. 10, 11, 14 and 15, marked on brass cap T I N S 10 in NW.

R I E S 11in NE.

S 14 in SE. and

S 15 in SW. quadrants

Subdivision of T.I N.R.I E.

Chains.

From which

A spruce 8 ins.in diam.bears N.14°08'E.30½ lks.dist. marked T I N R I E S 11 B T.

A spruce 6 ins.in diam.bears S.89°00'E.45½ lks.dist. marked T I N R I E S 14 B T.

A spruce 10 ins.in diam.bears S.22°00'W.1.15 chs.dist. marked T I N R I E S 15 B T.

A spruce 9 ins.in diam.bears N.46°15'W.38 lks.dist. marked T I N R I E S 10 B T.

Land level 44.61 chs. River bluffs 7.65 chs.

Soil --31.20 chs.in S half ,vegetable mold on glacial sub-soil. 13.41 chs. loam 2 ft.deep alluvial deposit.

Timber--Spruce,cottonwood and aspen.39.70 chs.

Dense undergrowth 44.61 chs.

June 16, 1911.

N.89°54'E.on a random line bet,secs.11 and 14.

40.00 Set temp.¼ sec.cor.

80.00 Intersect N.and S.line 9 lks.N.of cor.secs.11, 12, 13 and14.

Thence I run S.89°58'W.on a true line bet.secs.11 and 14.

Over level land

Through heavy spruce timber and dense undergrowth.

10.00 Leave heavy spruce timber,enter aspen timber bears N.andS.

40.00 Set an iron post 3 ft.long 1 in.in diam.26 ins.in the ground for ¼ sec.cor. marked on brass cap ¼ S 11 on N. half and S 14 on S.half; From which

An aspen 10 ins.in diam.bears S.18°30'W.15 lks.dist. marked ¼ S 14 B T.

An aspen 14 ins.in diam.bears N.35°W.12 lks.dist. marked ¼ S 11 B T.

56.16 Descend abruptly from terrace bears NW.and SE.Soil washed off.

60.36 Foot of steep descent bears NW.and SE. Descend gradually.

80.00 The cor.secs.10, 11, 14 and 15.

Subdivision of T.I N.R.I E.

Chains

Land level 56.16 chs. 4.20 chs.very steep bluff.

19.64 chs.gentle slope.

Soil---Loam light and porous 2 ft.deep on glacial sub-soil.

Timber--Aspen and spruce 80.00 chs.

Dense undergrowth 80.00 chs.

June 16, 1911.

N.0°03'W.bet.secs.10 and 11.

Ascend grad.through scattering spruce and aspen timber ~~and~~ with dense undergrowth.

27.75 Foot of terrace bears NW.and SE.Ascend.

36.00 Top of terrace, 200 ft.high bears NW.and SE.Ascend gradually.

40.00 Set an iron post 3 ft.long 1 in.in diam.26 ins.in the ground for ¼ sec.cor.marked on brass cap ¼ S 10 on W half and S 11 on E.half from which

An aspen 9 ins.in diam.bears N.69°16'E.279 lks.dist. marked ¼ S 11 B T.

An aspen 10 ins.in diam.bears N.16°02'W.126 lks.dist. marked ¼ S 10 BT.

June 22, 1911.

62.00 Top of bench bears NE.and SW.Descend gradually.

75.00 Leave aspen,enter heavy dead spruce timber bears E.and W.

80.00 Set an iron post 3 ft.long 2 ins.in diam.24 ins.in the ground for cor.secs.2,3,10 and 11,marked on brass cap

T I N S 3 in NW. R I E S 2 in NE.
S 11 in SE. and S 10 in SW.quadrants from which

An aspen 10 ins.in diam.bears N.16°50'E.1.14 chs.dist. marked T I N R I E S 2 B T.

A spruce 9 ins.in diam.bears S.59°10'E.21 lks.dist. marked T I N R I E S 11 B T.

A spruce 10 ins.in diam.bears S.3°08'W.2.15 chs.dist. marked T I N R I E S 10 BT.

An aspen 6 ins.in diam.bears N.43°00'W.1.54 chs.dist. marked T I N R I E S 3 B T.

Land rolling. Soil sandy loam,loose warm and dry.

Timber-- Scattering spruce and aspen.

Subdivision of T.I NR.I E.

Chains.N.89°58'E.on a random line bet.secs.2 and 11.

40.00 Set temp.¼ sec.cor.

79.93 Intersect N.and S line at the cor.secs.1,2,11 and 12

Thence I run S.89°58'W.on a true line bet.secs.2 and 11.

Over rolling land through heavy spruce timber.

5.00 Creek with clear water in holes overgrown with willows.

course SE.Leave heavy spruce timber enter scattering

spruce and aspen timber bears NW.amd SE.

39.96½ Set an iron post 3 ft.long 1 in.in diam.26 ins.in the

ground for ¼ sec.cor.marked on brass cap ¼ S 2 on N.half and S 11 on

S.half;from which

A spruce 8 ins.in diam.bears S.19°E.6 lks.dist.

marked ¼ S 11 B T.

An aspen 8 ins.in diam.bears N.N.71°W.7½ lks.dist.

marked ¼ S 2 B T.

79.93 The cor secs.2,3, 10 and 11.

Land rolling. Soil vegetable mold 1 ft.deep on glacial deposit.

Timber Spruce aspen cottonwood 79.93 chs. June 23,1911.

N.0°03'W.on a random line bet.secs.2 and 3.

40.00 Set temp.¼ sec.cor. June 26,1911.

79.96 Intersect N.bdy.tp.19 lks.E.of cor.secs.2,3,34 and 35.

Thence I run S.0°11'E.on atrue line bet.secs.2 and3.

Over level land through spruce and aspen timber and dense undergrowth.

39.96 Set an iron post 3 ft.long 1 in.in diam.26 ins.in the ground

for ¼ sec.cor.marked on brasscap ¼ S 3 on W half and S 2 on E.half;from which

An aspen 10 ins.in diam.bears S.65°30'E 34 lks.dist.

marked ¼ S 2 B T.

An aspen 14 ins.in diam.bears S.28°W.20 lks.dist.

marked ¼ S 3 B T.

Thence along edge of river bluffbears S.and N.20°W.

79.96 The cor.secs.2, 3, 10 and 11.

Land nearly level.

Soil sandy loam light and dry.

Timber ---- Aspen and spruce 79.96 chs.

Dense undergrowth 79.96 chs.

June 27, 1911.

J. Frank Wanner
U.S. Surveyor.

Subdivision of T.1 N.,R.1 E.

At the standard cor. secs.33 and 34 on the south Bdy.
~~T.1 N R.1~~ E in Lat.61°49'12"N.ong.145°13'13?"W.

I observe the altitude of the sun's center as follows reversing the instrument after each observation;

Alt.		
34°18'	at 8:19hrs.A.M.l.m.t.turn left to hub	129°59'
34°44'	at 8:24hrs.A.M.l.m.t.turn left to hub	129°55'
35°34'	at 8:32hrs.A.M.l.m.t.turn left to hub	131°29'
36°12'	at 8:38hrs/A.M.l.m.t.turn left to hub	133°28'

Mean time of observations 8hrs 28m 15secs.A.M.l.M.t.

Solution of 1st observation.

Declination corrected for change 6.16hrs.

Refraction for alt/1'17"

28°10'48" colat.	s.c.sincolat. .375634
55°47'17" coalt.	s.c.sin coalt. .082868
69°51'07" codecl.	sin ½s 9.983507
2)153°45'12"	sin ½S-codecl. 9.087417
76°52'36" ½S	2)19.484826
69°51'07"	9.742413 = ½cosin.
7° 01'29" ½S-codecl.	
56°27'45"	
2	
112°55'30" azimuth of sun from north.	
S.67°04'30"E. course to sun.	
133°59' - angle bet.sun and mark.	
196°03'30"	
180°	
N.16°03'30"W.to tacked hub	

1st.observation gives course	N.16°03'30"W.
2nd .observation gives course	N.15°59'42"W.
3rd.observation gives course	N.16°03'16"W.
4th.observation gives course	N.15°59'10"W.
Mean of 4 observations	N.16°01'24"W. to hub.

I commence at the standard cor.secs.33 and 34on the S. bdy.Tp.which is a granite stone 12x6x6 ins.above ground firmly set,properly marked and witnessed as described by the surveyor general.

Subdivisions of T.1 N.R.1E.

Thence I run

N.0°5'W.bet.secs.33 and 34

Over rolling land,through scattering spruce and aspen timberaand dense undergrowth of willows.

15.00 Right bank Willow creek in bend,comes from S.60°W,?flows S.15°E.for 3chs.thence.S.60°E. 50 lks.wide 6 ft.deep pure cold clear water,muddy bottom.

15.50 Left bank Willow creek.

38.50 Enter heavy spruce,cottonwood and aspen timberbbears N.W.and S.E.

40.00 Set an ieon post 3 ft.long 1 in.in diam.26ins.in the ground for ¼ sec.cor.marked on brass cap ¼ S 33 on W. half and S 34 on E.half;from which

A cottonwood 10 ins.in diam.bears N.70°04'E.21 lks.dist marked ¼ S 33.B T.

Accottonwood 10 ins.in diam.bears S.78°55'W.6 lks.dist. marked ¼ S 34B T :

58.00 Leave heavy spruce and aspen timber bears N.W.and S.E.

67.30 Government wagon road leads from Valdez to Fairbanks bears N.20°W.and S.20°E.

68.30 Enter heavy spruce timber bears N.W.and S.E.

80.00 Set an iron post 3 ft long 2 ins.in diam.24 ins.in the ground for the cor.secs.27 - 28 - 33 and 34 marked on brass cap T 1N S 28 in N.W.

R 1 E S 27 in N.E.

S 34 in S.E.and

S 33 in S.W.quadrant;from which

A spruce 6 ins.in diam.bears N.44°40'E.91lks.dist. marked T 1 N R 1 E S 28 B T .

A spruce 10 ins. in Diam?bears S.80°36'E.381lks.dist. marked T 1 N R 1 E S 27 B T.

A spruce 9 ins.in diam.bears S.53°40'W.431lks.dist. Marked T 1 N R 1 E S 34 B T.

A spruce 6 ins.in diam.bears N.63°20'W.211lks.dist. marked T 1 N R 1 E S 33 B T.

Land rolling.

Soil vegetable mold light and porous 2 ft.deep 1st 38.50 chs.

remaining 41.50 chs.moss covered and frozen.

Heavy spruce,cottonwood and aspen timber 36.20 chs.

Dense undergrowth of willows 80.00 chs.

May 27 - 1911

East on a random line bet.secs.27 and 34.

40.00 Set temp.¼ sec.cor.

80.08 Intersect N.and S.line 33lks.S.of the cor.secs.26-27-34 and 35.

Thence I run

S.89°46'W.on a true line bet.secs.27 and 34

Over level land,through heavy cottonwood,aspen and spruce timber ~~and~~ dense undergrowth.

40.04 Set an iron post 3 ft. long 1 in.in diam.26 ins.in the ground for ¼ sec.cor. marked on brass cap

¼ S 27 on N.half and S 34 on S half;from which

A spruce 8 ins.in diam. bears S.56°00'E.32lks dist. marked ¼ S 34 BT.

A spruce 8 ins.in diam.bears N.40°15'W.23lks.dist. marked ¼ S 27 B T.

42.00 Leave heavy spruce and aspen timber enter burned timber bears N.&S.

65.00 Leave burned timber enter heavy green spruce timber NE and SW.

74.25 U.S.Military Telegraph line and old pack trail bears N.12½°W. and S.12½°E.

80.08 The cor.secs.27-28-33and 34.

Land level.

Soil vegetable mold 1ft.deep,moss covered and frozen.

Heavy spruce,cottonwood and aspen timber 57.08 chs.

Burned timber 23.00 chs.

Dense undergrowth 80.08 chs.

May 29 1911

Subdivision of T.1 N,R.1 E.

chains

N.0°5'W.bet.secs.27 and28

Over level land.

Through heavy spruce timber and dense undergrowth of willows.

18.00 Leave heavy spruce timber enter burned timber bears E.and W.

32.85 Old trail bears NE and SW.

34.00 Leave burned timber enter heavy spruce timber bears E and W.

36.40 Old trail bears NE and SW.

40.00 Set an iron post 3 ft. long 1 in.in diam. 26 ins.in the ground for ¼ sec.cor. marked on brass cap

¼ S 28 on W.half andS.27 on E.half;from which

A spruce 15 ins.in diam.bears S.51°45'E.1.30chs.dist. marked ¼ S 27 B T.

A spruce 10 ins.in diam.bears S.1°00'W.3.76 chs.dist. marked ¼ S 28 B T.

47.80 Military telegraph line bears N.32°W and S.32°E.

49.50 Old horse trail bears NW andSE.

57.50 Leave heavy spruce timber enter burned and scattering timber bears Eand W.

80.00 Set an iron ~~post 3 ft. long 2ins.in diam~~ pipe, length 3, .24 ins.in the ground for the cor.secs.21-22-27 and 28,marked on brass cap T 1 N S21 in NW.

R 1 E S 22 In NE

S 27 in SE and

S 28 in SW quadrants; from which

A spruce 10 in.in diam.bears N.6°35'E.68 lks.dist. Marked T 1 N R 1 E S 26 B T.

A spruce 10 in.in diam.bears S.49°35'E.321lks.dist. markd. T 1 N R 1 E S27 B T.

A spruce 10 ins.in diam.bears S.37°35'W.581lks.dist. marked T 1 N R 1 E S 28 B T.

A spruce 10 ins.in diam.bears N.46°30'W.571lks.dist. markd. T 1 N R 1 E S21 B T.

Subdivisions of T.1 N, R.1 E.

chains

Land level.

Soil moss coverd and frozen 41.50 chs.Vegetable mold light and porous 2 ft.deep 38.50 chs.

Heavy spruce timber 41.50 chs.

Dense undergrowth willows 38.00 chs.

June 7 1911

N.89°46'E.on a random line bet.secs.22 and 27

40.00 Set temp.¼ sec.cor.

80.12 Intersect N.and S.line at the cor.secs.22-23-26 and 27

Thence I run

S.89°46'W.on a true line bet.secs.22 and 27

Over level land,through heavy spruce,aspen and cottonwood timber and dense undergrowth.

40.06 Set an iron ~~post~~ ~~3 ft.long 1 in.in diam~~.26 ins.in the ground for ¼ sec.cor.marked on brass cap ¼ S ~~26~~ 22 on N. half and S 27 on S half;from which

A spruce 9 ins.in diam.bears N.42°30'E.28lks.marked ¼ S ~~26~~ 22 B T.

A spruce 7 ins.in diam.bears S.71°15'E.35lks.marked ¼ S 27 B T.

49.00 Leave green timber enter partly burnedttimber bears N.and S.

80.12 The cor.secs.21-22-27-and 28.

Land level.

Soil vegetable mold 1 ft.deep,on glacial deposit,cold wet and frozen.

Timber -Spruce,cottonwood and aspen 8ins.diam. 80.12 chs

June8 1911

H. Wilson Williamson

Transitman.

Subdivision of T.1 N,R.1 E.

chains

July 12 1911 at this cor I observe the altitude of the suns center ,mean time of observations being 7hrs 42m A.M.1/m.t.and mark the line thus determined on a tacked hub.

Alt.

31°57'	turn right to hub	79°19'
32°18'	turn right to hub	78°35'
32°39'	turn right to hub	77°52'

Solution of 1st observation.

Mean time of observation 7hrs.42m.A.M.1.m.t.

Declination corrected for 5.38hrs.

Refraction for alt.1'25"

28°08'44"colat.	a.c.sin colat.	0.326322
58°04'25"coalt.	a.c. sin coalt.	0.071231
66°52'49"codecl.	sin ½S	9.987922
2|153°05'58"	sin ½ S)-codecl.	9.225216
76°32'59" ½ S	2|	19.610691
66°52'49"		(9.805345 = ½ cosin
9°40'10" ½ S-codecl		

50°18'
2

100°36'azimuth from north.

S.79°24'E.course to sun.
79°19' angle bet.sun and mark

S.0 °05'E.course to tacked hub.

1st observation gives course S.0°05'E.
2nd observation gives course S.0°06'34"E.
3rd observation gives course S.0°06'34"E.

Mean of 3 observations S.0°06'03"E.

Thence I run

N.0°05'W.bet.secs.21 and 22.

Over level land through burned and scattering green timber and dense undergrowth.

25.22 Indian trail from Willow creek to Copper Center bears NE.and SW.

28.45 Leave burned and scattering timber enter heavy spruce timber bears N.45°W.and S.45°E.

40.00 Set an iron post 3 ft.long 1 in.in diam.26 ins.in the ground for ¼ sec.cor.marked on brass cap

Subdivisions of T.1 N,R.1 E.

chains

¼ S 21 on W.half and S.22 on E.half;from which

A spruce 6 ins.in diam.bearsN19°20'E.51 lks.dist.

marked ¼ S 22 B T

A spruce 6 ins.in diam.bears N.62°55'W.23 lks.dist

marked ¼ S 21 B T .

80.00 Set an iron post 3 ft. long 2 ins.in diam.24 ins.in

the ground for the cor.secs.15-16-21 and 22

marked on brass cap

T L N S 16 in NW

R L E S 15 in NE

S 22 in SE and

S 21 in SW quadrants;from which

A spruce 6 ins.in diam.bears N.72°05'E.69lks dist.

marked T.1 N.R1 E.S 15 B T.

A spruce 6 ins.in diam.bears S.50°05'E.25lks dist.

marked T I N R I E S22 B T.

A spruce 7 ins.in diam.bears S.29°55'W.35lks.dist.

marked TI N R I E S21 B T.

A spruce 8 ins.in diam.bears N.22°25'W.35lks.dist.

marked T I N R I E S16 B T.

Land level.

Soil vegetable mold 2ft.deep light and porous 1st

28.45chs.remaining 51.55 chs.moss covered and frozen

Heavy spruce timber 51.55 chs.

Burned and scattering spruce 28.45 chs.

Dense undergrowth and fallen timber 80.00 chs.

June 12 1911

N.89°46'E.on a random line bet?secs.15 and 22 .

40.00 Set temp.¼ sec.cor.

80.04 Intersect N.and S.line 5 lks N.of cor.secs.14-15-22a

and 23.

Thence I run

~~S.39~~ S.89°48'W.on a true line bet. secs.15 and 22.

Over level land through heavy spruce and cottonwood

timber and dense undergrowth.

Subdivision of T.1 N.R.1 E.

chains

17.50 Valdez trail bears N and S/leads from Valdez to Copper Center

40.02 Set an iron post 3 ft.long 1 in.in diam.26 ins.in the ground for ¼ sec.cor.marked on brass cap 1/4 S 15 on N.half and S.22 on S.half;from which
A spruce 9ins.in diam.bears S.45°E.6 lks.dist. Marked 1/4S 22 B T.
A cottonwood 9 ins.in diam. bears N.48°W.32 lks.dist marked 1/4 S 15 B T.

41.60 Trail bears N.and S.Connecting trail from Military trail to Valdez trail.

80.04 The cor.secs.15-16-21and 22.

Land level.

Soil vegetable mold 1ft.deep on glacial deposit:E.½ dry.W.½ swampy and all frozen land.

Timber-spruce aspen and cottonwood 80.04chs.

June 13 1911.

N.0°05'W.bet.secs.15 and 16.

Over level land through heavey spruce and aspen timber dense undergrowth and fallen logs.

40.00 Set an iron post 1 in .in diam .26 ins.in the ground for 1/4 sec.cor.marked on brass cap 1/4 S 16 on W. half and S 15 on E.half;from which
A spruce 7 ins. in diam.bears N.6°30'E.7 lks dist. marked 1/4 S15 B T.
A spruce 7 ins.in diam.bears S.20°15'W.33 lks.dist. marked 1/4 S 16 B T.

58.98 Descend over NE slope.

62.37 Bottom of dry gulch course NE. Ascends over SE.slope.

74.35 Top of ascent bears NW.and SE. Descend abruptly over NE.slope.

80/00 Set an iron post 3 ft.long 2 ins.in diam.24 ins in th ground for cor. secs.9-10-15and 16 marked on brass cap

Subdivisions of T.I N.R.I E.

chains T I N S 9 in NW.

R I E S 10 in NE.

S 15 in SE.and

S 16 in SW.quadrant:from which

A spruce 18 ins.in diam.bears N.52°40'E.941ks.dist.

marked T I N R I E S 10 B T.

A spruce 20 ins.in diam.bears S.84°20'E.921ks.dist.

marked T I N R I E S 15 B T.

A spruce 24 ins.in diam.bears S.77°35'W.421ks.dist.

marked T I N R I E S 16 B T.

A spruce 24ins.in Diam.bears N.24°05'W/381ks.dist.

marked T I N R I E S 9 B T.

Land level and steep SE.and NE.slopes.

Soil moss covered and frozen vegetable mold 1 ft.deep

Heavy spruce timber 80.00 chs.

Dense undergrowth and fallen logs 80.00 chs.

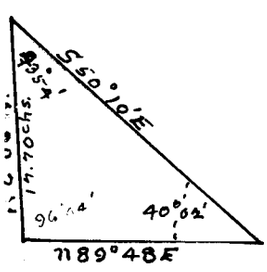
June 17-1911

N.89°46'W.on a random line bet.secs.10 and 15.

40.00 Set temp.1/4 sec.cor.

48.76 Right bank of Copper river . Set temp.meander cor.

~~Set~~ flag on line across river on left bank.To determine distance across river run base line N.6°06'W.17.70 chs;From N.end of base ~~where~~ flag on left bank bears S.50°10'E.which gives for triangulation Sin 40°02': sin 43°54'::17.70: 19.08 chs.



log sin		log sin		
9.808368	:	9.840985	::	1.247973
				9.840985
				1.088958
				9.808368
				1.280590 = 19.08 chs.dist.

across river 48.76 chs.~~making~~

67.84 Left bank Copper river set temp.meander cor.

80.02 Intersect N.and S.line at the cor.secs.10-11-14 and 15.

Thence I run

Subdivision of T.1 N,R.1 E.

chains

S.89°48'W.on a true line bet.secs.10 and 15

Over nearly level land,through heavy spruce and cottonwood timber and dense undergrowth.

12.18 Left bank of Copper river.Set a granite stone 18x12x6ins. 12 ins.in the ground for meander cor.of frac.secs. 10 and 15 marked M C on W.face with 4 grooves on on S.face;from which

A spruce 10 ins.in diam.bears N.83°30'E.42 lks.dist. marked T 1 N R 1 E S 10 M C B T .

A spruce 16 ins.in diam.bears S.34°E.66 lks.dist. marked T 1 N R 1 E S 15 M C B T.

31.26 Right bank of Copper river.Set a granite stone 15 x 8 x 6 ins.10 ins.in the ground for meander cor.frac.secs. 10 and 15 marked M C on E.with 4 grooves on S.face From which

A cottonwood 9 ins.in diam.bears N.57°15'W.9 lks. dist.marked T 1 N R 1 E S 10 M C B T.

A cottonwood 10 ins.in diam.bears S.8°30'W.34 lks. dist.marked T 1 N R 1 E S 15 M C B T.

Thence through alder thicket.

36.78 Leave alder thicket bears N.and S.

38.00 Slough 25 lks.wide course S.enter spruce timber and ascend abruptly.

40.01 Set an iron post 3 ft.long 1 in.in diam.26 ins.in the ground for ¼ sec.cor. marked on brass cap 1/4 S10 on W.half and S 15 onS.half;from which

A spruce 9 ins.diam.bears N.64°E.17 lks.dist. marked 1/4S 10 B T.

A spruce 8 ins.diam.bears S.30°W.8 lks.dist.marked 1/4 S 15 B T.

41.00 Valdez trail bears N.and S.on brow of bluff 1.00ft. abovevriver,thence over level land.

80.02 The cor.secs.9-10-15 and 16.

Land nearly level 77.02 chs. 3chs.river bluff.

Soil sandy loam 18.92 chs.,alluvial. 4202 chs. vegetable mold on glacial sub-soil.

Subdivision of T.I N.R.I E.

chains

Timber - spruce and cottonwood 55.40chs.

Dense undergrowth 60.94 chs.

June 19 1911

N.0°05'W.bet.secs.9 and 10. Over steep NE.slope.Descend. Through heavy spruce timber and dense undergrowth of willows.

9.55 Foot of steep descent bears NW And SE.Thence over level land.

27.60 Indian trail leads from Goverment wagon road to Copper river bears N.70°E.and S.70°W.

40.00 Set an iron post 3 ft.long 1 in?in diam.26 ins.in the ground for 1/4 sec?cor.marked on brass cap 1/4 S 9 on W.half and S 10 on E half;from which

A spruce 10 ins.in diam. bears S.38°05'E.14 lks. dist.marked 1/4 S 1 0 B T.

A spruce 8 ins.in Diam.bears N.3°20'W.21 lks.dist. marked 1/4 S 9 B T.

80.00 Set an iron post 3 ft.long 3 ins.in diam.24 ins?in the ground for the co r.secs.3-4-9 and 10 marked on brass cap

T I N S 4 in NW.

RI E S3 in NE.

S 10 in SE and

S 9 in SW.quadrant;from which

A spruce 8 ins in diam.bears N.24°40'E.22 lks.dist. marked T I N R I E S 3 B T .

A spruce 9 ins.in diam.bears S.63°28'E.39lks.dist. marked T I N R I E S 10 B T .

A spruce 9 ins.in diam.bears S.36°45'W.93 lks.dist. marked T I N R I E S 9 B T.

A spruce 10 ins.in diam.bears N.36°35'W.29 lks.dist. marked T I N R I E S 4 B T .

Land steep E.slope and level.

Subdivision of T.1 N.R.1 E.

chains

Soil sandy loam about 2ft.deep on clay deposit.

Heavy spruce and aspen timber 80.00chs.

Dense undergrowth willows 80.00chs.

June 24 1911

N.89°48'E.on a random line bet.secs.3 and 10

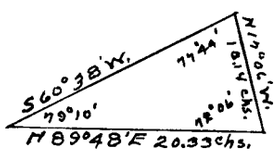
33.73 Right bank of Copper river, set temp. meander cor. flag ~~across river~~ on line

Cross river and run base line N.17°06'W.10.14chs.

From N.end of base,flag on right bank bears S.60°38'W.

which gives for triangulation

sin 29°10': sin 77°44':: 10.14 chs.: 20.33 chs.



log sin		log sin		
9.687843	:	9.989990	::1.006038	
			9.989990	
			0.996008	
			9.687843	
			1.308155	= 20.33 chs.

distance across river 33.73 chs. ~~making~~

54.06 Left bank Copper river .Set temp.meander cor.

80.08 Intersect N.and S.line 19 lks.N.of cor.secs.2-3-10 and 11.

Thence I run

S.89°56'W.on a true line bet.secs.3 and 10.

Ascend gradually in young aspen and spruce timber and dense undergrowthand windfalls.

1.00 Top ascent.Descend steep west slope.

12.58 Foot descent bears N.andS.3.00 ft.below sec.cor.

Enter heavy spruce timber bears N.and S.

17.30 Indian trail bears N.and S.

23.07 River bluffbears N.and S.descend abruptly.Leave heavy spruce enter cottonwood timber.

26.02 Set a granite stone 14 x 8 x 6 ins.9 ins.in the ground for meander cor.of frac.secs.3 and 10 marked 1 C on W.face with 5 grooves on S.face;raise a mound of stone 3½ft.base 1½ ft.high E.of cor.

1/4 sec.cor.falls in river.

Subdivision of T. I N., R. I E.

chains

46.35 Right bank Copper river. Impracticable to establish meander corner at this true point, owing to liability to destruction by ice. Enter dense undergrowth and scattering spruce timber. Land level.

47.13 Set a river boulder 18 x 9 x9 ins. 12 ins. in the ground for witness cor. to meander cor. of frac. secs. 3 and 10 marked W.C. M C on E. with 5 grooves on S. face; from which

A spruce 10 ins. diam. bears N. 52°07'W. 90 lks. dist. marked T I N R I E S 3 W.C.M C B T.

A spruce 10 ins. in diam. S. 20°25'E. 51 lks. dist. marked T I N R I E S 10 W C B T.

57.80 Foot of bluff bears NW and SE. Ascend.

60.80 Top of bluff bears NW and SE. 50 ft. above river bottom thence over level land.

67.60 Enter heavy spruce and cottonwood timber bears NW and SE.

80.08 The cor. secs. 3-4-9 and 10.

Land broken and level.

Soil - 23.07 chs. in E. half sandy loam, light and dry.

2.95 chs. on east side river bluff no soil.

33.65 chs. river bottom not subject to overflow soil alluvial deposit.

Timber - Heavy speuce 22.97 chs. Cottonwood 36.78 chs. Young growth of spruce cottonwood and dense under-growth.

June 26 1911

N. 0°05'W. on a random line bet. secs. 3 and 4.

38.66 Right bank of Copper river. Set temp. meander cor. ¼ sec. cor. falls in the river.

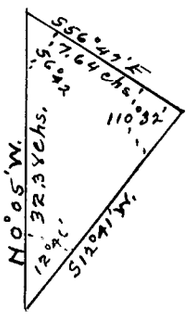
To determine distance across river, set flag across river on line and leave flag on right bank.

Cross river and run base line S. 56°47'E. 7.64 chs.

From east end of base flag on right bank bears S. 12°41'W. which gives for triangulation

Subdivision of T. I N, R. I E.

chains



sin12°46' : 110°32' :: 7.64chs. :32.38 chs.

log sin log sin

9.344355 : 9.971473 :: log. 0.883093
9.971493

10.854586
9.344355

1.510231 = 32.38 chs.

distance across river ~~plus~~ 38.66 chs. ~~making~~

71.04 Left bank Copper river. Set temp. meander cor.

80.02 Intersect N.bdy. of township at the cor secs. 3 - 4 - 33 and 34.

Thence I run

S.0°05'E. on a true line bet. secs. 3 and 4.

Over level land, through heavy spruce and cottonwood timber and dense undergrowth.

~~8.98~~ Left bank Copper river. Set a sand stone 16 x 1 3 x6 ins. 11 ins, in the ground for meander cor. of frac. secs. 3 and 4 marked M C on S. face with 3 grooves on E. face; from which

A spruce 7 ins. in diam. bears N.83°30'E. 67 lks. dist. marked T I N R I E S ~~2~~ 3 M C B T.

A spruce 9 ins. in diam. bears N.55°W. 28 lks. dist. marked T I N R I E S ~~3~~ 4 M C B T.

40.00 ¼ sec. cor. falls in the river.

41.36 Right bank of Copper river. Set a granite stone 18 x 10 x9 ins 12 ins. in the ground for meander cor. frac. secs. 3 and 4, marked with M C on N. with 3 grooves on E. faces: dig pit 36 x 36 x 12 ins. deep 8 ft. S. of stone and raise a moundoof earth 4 ft. base 2 ft. high S. of cor.

Enter dense undergrowth

41.44 Indian trail bears NW. and SE.

60.52 Leave bottom land bears NW. and SE. ascend NE. slope.

64.29 Top of ascent bears NW. and SE. 85 ft. above river bottom, thence over level land.

66.00 Enter heavy spruce timber bears NW. and SE.

Subdivision of T.I N.R.I E.

chains

80.02 The cor.secs.3 - 4 - 33 and 34.

Land nearly level.

Soil sandy loam warm and dry.

Timber & Heavy spruce 14.00 chs.

Dense undergrowth 33.64chs.

June 26 1911 J. Frank Warner U.S. Surveyor

May 29, ~~1911~~ at the standard corner secs.32 and 33 ~~T.I.N R.I.E.~~ Latitude 61°49'12"N., Long.145°15'03"W.

which is a granite stone 12 x 12 x8 ins.above ground firmly set and marked and witnessed as described by the surveyor general,

~~To~~ determine the true meridian I observe the alt.of the sun's center as follows:

Altitude

28°53' at 4hrs.33m.P.M.l.m.t.turn left to hub 12°30'30"

27°59' at 4hrs.41m.P.M.l.m.t.turn left to hub 14°16'

27°18' at 4hrs.46m.P.M.l.m.t.turn left to hub 15°35'

Mean time of observations 4hrs.42m.30secs.P.M.l.m.t.

Decl.corrected for change 14.39 hrs.

Refraction for alt.1'37"

28°10'48"colat.	a.c.sin	0.325834
61°08'37"coalt.	a.c.sin	0.057579
68°24'53"codecl.		
2)157°44'18"		
78°52'09" ½ S	sin	9.991743
68°24'53"		
10°27'16" ½ S-codecl.	sin	9.258766
		2)19.633922
		9.816961

½ cosin 48°59'52"
2
97°59'44" azimuth from north
S.82°00'16"W.course to sun
12°30'30" angle bet.sun and hub.
S.69°29'46"W.course to hub.

1st observation gives course S.69°29'46"W.
2nd observation gives course S.69°29'38"W.
3rd observation gives course S.69°29'42"W.
Mean of 4 observations S.69°30'00"W.

Thence I run

N.0°07'W.bet.secs.32 and 33.

Over rolling,moss covered land.Frozen.

Through heavy spruce timber and dense undergrowth of willows

Subdivision of T I N R I E.

chains

7.00 Creek 10 lks.wide,12 ins.deep,pure clear water muddy bottom,course NE.flows into Willow creek. Enter swampy land,overflow from Willow creek.

15.10 Center of Willow creek 50 lks.wide,2 ft.deep,muddy bottom good water,course S.80°E.

19.00 Leave heavy spruce timber.Enter burned timber bears E.and W.

35.00 Leave burned timber bears E.and W.Thence through scattering spruce timber and dense undergrowth of willows.

40.00 Set an iron post,3 ft.long,1 in.in diam.26 ins.in the groun ground for ¼ sec.cor.,marked on brass cap ¼ S 32 onW. half and S.33 on E.half;from which

A spruce 8 ins.in diam.bears N.72°30'E.1.87 chs.dist. marked ¼ S 33 B T.

A spruce 6 ins.diam.bears S.2°15'W.76 lks.dist. marked ¼ S 32 B T.

45.00 Creek 10 lks.wide,6 ins.deep,pure clear water,muddy bottom course SE.into Willow creek.

80.00 Set an iron post 3 ft.long 2 ins.in diam. 24 ins in the ground for cor.of secs.28,29,32 and 33;marked on brass cap

T I N S 29 in NW.
R I E S 28 in NE.
S 33 in SE.and
S 32 in SW.quadrant;from which

An aspen 7 ins.in diam.bears N.34°30'E.64 lks.dist. marked T I N R I E S 28 B T.

A spruce 8 ins. in diam.bears S.75°40'E.1.42 chs.dist marked T I N R I E S 33 B T.

A spruce 8 ins.in diam.bears S.89°40'W.7.88chs.dist. marked T I N R I E S 32 B T.

A spruce 8 ins.in diam.bears N.24°15'W.84 lks.dist. marked T I N R I E S 29 B T.

Land rolling.

Subdivision of T.1 N,R.1 E.

chains

Soil moss covered and frozen 1st 7.00 chs.,remaining 73.00 chs.subject to overflow from Willow creek.

Heavy spruce timber 19.00 chs.

Dense undergrowth of willows and brush 80.00 chs.

May 30 1911.

East on a random line bet.secs.28 and 33.

40.00 Set temp.¼ sec.cor.

80.06 Intersect N.and S. line at the cor.secs.21,22,27,and 28.

Thence I run

West on a true line bet.secs.28 and 33.

Over level,frozen,moss covered land.

Through heavy spruce timber.

4.50 Government wagon road,Valdez to Fairbanks,bears N.20°W. and S.20°E.Leave heavy spruce timber and frozen moss covered land bears NW.and SE. Enter scattering aspen and spruce timber.

40.03 Set an iron post 3 ft.long 1 in.in diam.,26 ins.in the ground ground for ¼ sec.cor.marked on brass cap ¼ S 28 on N. half and S 33 on S.half;from which

An aspen 8 ins.in diam.bears S.86°15'E.1.04 chs.dist. marked ¼ S 33 B T.

An aspen 8 ins.in diam.bears N.53°15'E.80 lks.dist. marked ¼ S 28 B T.

42.00 Leave aspen timber enter heavy spruce timber bears NE.and SW.

59.00 Leave heavy spruce timber enter burned timber,bears NE. and SW.

65.60 Leave burned timber,enter heavy aspen timber bears NE. and SW.

76.06 East edge of swampy land bears NW.and SE.

80.06 The cor.secs.28,29,32 and 33.

Land level.

Soil moss covered and frozen 1st 4.50 chs.,last 4.00 chs. swampy and remaining 70.56 chs.vegetable mold,2 ft.deep

chains

light and porous.

Heavy spruce and aspen timber 76.00 chs.

May 31 1911.

N.0°07'W.bet.secs.28 and 29.

Over level moss covered land;frozen.

Through heavy spruce and aspen timber ~~and~~ with dense undergrowth

11.00 S.bank small shallow lake or pond extends west 1.00 ch. and east 50 lks.

12.00 N.bank ~~small shallow lake or pond.~~

40.00 Set an iron post 3 ft.long 1 in.indiam.26 ins.in the ground for ¼ sec.cor.marked on brass cap ¼ S.29 onW. half and S 28 on E.half;from whidh

An aspen 10 ins. in diam.bears N.10°25'W.34 lks.dist. marked ¼ S 29 B T.

A spruce 24 ins. in diam.bears N.26°58'E.88 lks.dist. marked ¼ S 28 B T.

80.00 Set an iron ~~post 3 ft.long 2 ins.in diam.~~24 ins.in the ground for cor.secs.20,21,28 and 29 marked on brass cap

T I N S 20 on NW.

R I E S 21 on NE.

S 28 on SE.and

S 29 on SW.quadrants;from which

A spruce 8 ins.in diam bears N.42°32'E.22 lks.dist. marked T I N R I E S 22 B T.

A spruce 20 ins.in diam.bears S.33°32'E.66 lks.dist. marked T I N R I E S 28 B T.

A spruce 10 ins.in diam.bears S.7°16'W.68 lks.dist. marked T I N R I E S 29 B T.

A spruce 8 ins.in diam.bears N.7°13'W.33 lks.dist. marked T I N R I E S 20 B T.

Land level.

Soil moss covered and frozen.

Subdivision of T.I N,R.I E.

chains

Heavy spruce and aspen timber 79.00 chs.

Dense undergrowth 79.00 chs.

Lake -1.00 ch.

June 9 1911.

East on a random line bet.secs.21 and 28.

40.00 Set temp.¼ sec.cor.

80.06 Intersect N.and S.line at the cor of secs.21,22,27 and 28

Thence I run

West on a true line bet.secs.21 and 28.

Over rolling land.

Through scattering spruce and burned timber.

10.90 Old pack trail bears N.32°W.and S.32°E.

12.30 Military telegraph line bears N.32W.and S.32°E.

32.90 Government wagon road,leads from Valdez to Fairbanks, bears N.20°W.and S.20°E.

40.00 Set an iron post 3 ft.long 1 in.in diam. 26 ins. in the ground for ¼ sec.cor.marked on brass cap ¼ S 21 on N. half and S 28 on S.half;from which

A spruce 8 ins.in diam.bears S.71°05'W.1.94 chs.dist. marked ¼ S 28 B T.

A spruce 8 ins.in diam.bears N.81°30'W.2.48 chs.dist. marked ¼ S 21 B T.

47.50 Leave burned timber enter heavy green spruce timber bears N.and S.

48.50 Leave heavy green spruce timber enter burned timber bears N.and S.

68.50 Leave burned timber enter heavy green spruce timber bears N.and S.~~Enter~~ frozen,moss covered land.

80.06 The cor.secs.20,21,28,and 29.

Land rolling.

Soil vegetable mold,2 ft.deep,light and porous 1st 68.50 chs.;remaining 11.56 chs.moss covered and frozen.

Heavy spruce timber 11.56 chs.

Burned timber 67.50 chs.

Dense undergrowth 80.06 chs. June 10-1911

chains

N.0°7'W.bet secs.20 and 21.

Over rolling land.

Throuhg heavy spruce timber and dense undergrowth.

8.20 Leave heavy spruce timber enter burned timber bears E.and W.

15.00 East edge of shallow lake or pond,extends West 5 chs.and north 10.00 chs.

40.00 Set an iron post 3 ft.long 1 in.in diam.26 ins.in the g ground for ¼ sec.cor.marked on brass cap,¼ S 20 on w. half and S 21 on E.half;dig pits 18 x 18 x 12 ins. N.and S.of post 3 ft.dist.and raise a mound of earth 3½ ft.base 1½ ft.high West of cor.

June 14 1911

73.60 Enter heavy spruce timber bears E.and W.

80.00 Set an iron post 3 ft.long 2 ins.in diam.24 ins in the ground for the cor. of secs.16,17,20 and 21 marked on brass cap

T I N S 17 in NW.

R I E S 16 in NE.

S 21 in SE.and

S 20 in SW.quadrants;from which

A spruce 6 ins.in diam.bears N.58°15'E.1.04 chs.dist. marked T I N R I E S 16 B T.

A spruce 6 ins.in diam. bears S.2°20'E.68 lks.dist marked T I N R I E S 21 B T.

A spruce 6 ins.in diam.bears S.19°55'W.43 lks.dist. marked T I N R I E S 20 B T.

A spruce 6 ins. in diam.bears N.40°07'W.64 lks.dist. marked T I N R I E S 17 B T.

Land rolling.

Soil vegetable mold 2 ft.deep light and porous.

Heavy spruce timber 14.60 chs.

Burned timber 65.40 chs.

Dense undergrowth 80.00 chs.

Subdivision of T.I N,R.I E.

chains

East on a random line bet.secs.16 and 21.

40.00 Set temp.¼ sec.cor.

80.05 Intersect N.and S. line7 lks.S of the cor. of secs.15,16, 21 and 22.

Thence I run

S.89°57'W.on a true line bet.secs 16 and 21.

Over rolling land.

Through heavy spruce timber and dense undergrowth.

37.50 Leave heavy spruce timber enter burned timber and few scattering green spruce bears N.and S.

40.02½ Set an iron post 3 ft.long 1 in.im diam.26 ins.in the ground for ¼ sec.cor.marked on brass cap ¼ S 16 on N. half and S 21 on S.half;from which

A spruce 8 ins.in diam.bears N.58°35'E.84 lks.dist. marked ¼ S 16 B T.

A norway pine 8 ins.in diam.bears S.83°05'E.3.64 chs. dist.marked ¼ S21 B T.

46.97 Military telegraph line bears N.50°W.and S.50°E.3chs. thenS.10°E.

53.40 Old military pack trail bears N.50°W.and S.50°E.

60.30 Government wagon road,leads from Valdez to Fairbanks, bears N.30°W.and S.30°E.

71.00 Leave burned and scattering timber,enter heavy spruce timber bears N.and S.

80.05 The cor.secs.16,17,20 and 21.

Land rolling.

Soil moss covered and frozen 1st 37.50 chs.and last 9.05 chs..Remaining 33.50 chs.vegetable mold,2 ft. deep light and porous.

Heavy spruce timber 46.55 chs.

Burned timber 33.50 chs.

Dense undergrowth 80.05 chs.

June 15 1911.

Subdivision of T.I N,R.I E.

chains

N.0°07'W.bet,secs.16 and 17.

Over level land.

Through heavy spruce tomber and dense undergrowth.

15.00 Old military pack trail bears SW.andNE.Not in use.

21.30 Same trail NW.and SE.

23.19 Military telegraph line bears N.50°w.and S.50°E.

34.69 Trail bears N50°W. and S50°E.

40.00 Set an iron post 3 ft,long 1 in.in diam.26 ins.in the ground for ¼ sec.cor.marked on brass cap ¼ S 17 on W.half and S.16 on E.half;from which

A spruce 8 ins.in diam.bears N.17°W.6 lks.dist. marked ¼ S 17 B T.

A spruce 7 ins.in diam.bears N.48°05'E.10 lks.dist. marked ¼ S 16 B T.

June 19- 1911.

45.90 Government wagon road,leads from Valdez to Fairbanks, bears N.30°W.and S.30°E.

63.00 Indian trail bears E.and W.leads from Government road to Copper river.

80.00 Set an iron post 3 ft,long 2 ins.in diam.24 ins.in the ground for cor.secs.8,9,16,and 17.marked on brass cap

T I N S 8 in NW.

R I E S 9 in NE.

S 16 in SE.and

S.17 in SW.quadrants;from which

A spruce 8ins.in diam.bears N.23°20'E.22 lks.dist. marked T I N R I E S 9 B T.

A spruce 7ins.in diam.bears S.57°39'E.23 lks.dist. marked T I N R I E S 16 B T.

A spruce 8 ins.in diam.bears S.48°50'W.25 lks.dist. marked T I N R I E S 17 B T.

A cottonwood 10 ins.in diam.bears N.26°25'W.42 lks.dist. marked T I N R I E S 8 B T.

Land level.

Soil moss covered and frozen on glacial deposit.

Heavy spruce timber 80.00 chs.

Dense undergrowth 80.00 chs.

Subdivision of T.I N.,R.I E.

chains.

N.89°57'E.on a random line bet.secs.9 and 16.

40.00 Set temp.¼ sec.cor.

80.16 Intersect N.and S.line 2 lks.S of the cor.secs.9,10, 15 and 16.

Thence I run.

S.89°56'W.on a true line bet.secs.9 and 16.

Ascend abruptly on East slope.

Through heavy spruce timber and dense undergrowth.

6.22 Top of ascent on spur bears NE.and SW. Descend abruptly.

20.98 Creek 2 lks.wide 6 ins.deep,pure,clear cold water,stony bottom course N.70°E. Ascend steep slope.

22.20 Leave heavy spruce timber,enter clearing bears N.and S.

25.50 Top of ascent on edge of bluff 250 ft.above Copper river.Enter heavy spruce timber bears N.and S. Thence over level land.

40.08 Set an iron post 3 ft.long 1 in.in diam.26 ins.in the ground for ¼ sec.cor. marked on brass cap. ¼ S 9 on N half and S 16 on S.half;from which

A spruce 9 ins.in diam.bears S.38°00'E.46 lks.dist. marked ¼ S 16 B T.

A spruce 9 ins.in diam.bears North 15 lks.dist. marked ¼ S 9 B T.

45.00 Indian trail N.10°E.and S.10°W.leads from wagon road to Copper river.

80.16 The cor.secs.8,9,16 and17.

Land rolling and level.

Soil moss covered and frozen 76.86 chs.Remaining 3.30 chs vegetable mold 2 ft.deep light and porous,onglacial deposit.

Heavy spruce timber 76.86 chs.

Dense undergrowth 80.16 chs.

June 20 -1911.

Subdivision of T.I.N.R.I E.

chains

. N.0°07'W. bet.secs.8 and 9.

Over rolling land.

Through heavy spruce and aspen timber and dense undergrowth.

40.00 Set an iron post 3 ft.long 1 in.in diam.26 ins.in the ground for ¼ Sec.cor.marked on brass cap ¼ S 8 on W.half and S9 on E.half;from which

A spruce 12 ins.in diam.bears N.85°E.34 lks.dist. marked ¼ S 9 B.T.
An aspen 14 ins. in diam.bears S.51°15'W.36 lks.dist. marked ¼ S 8 B T.

80.00 Set an iron post 3 ft.long 2ins.in diam.24 ins.in the ground for cor.secs.4,5,8 and 9 marked on brass cap

T I N S 5 in NW.

R I E S 4 in NE.

S 9 in SE.and

S 8 in SW.quadrants;from which

A spruce 12 ins.in diam.bears N.27°30'E.49 lks.dist. marked T I N R I E S 4 BT.

A spruce 8 ins.in diam.bears.S.51°38'E.56 lks.dist. marked T I N R I E S 9 B T.

A spruce 8 ins.in diam.bears S.29°00'W.27 lks.dist. marked T I N R I E S 8 B T.

A spruce 12 ins.in diam.bears N.7°15'W.46 lks.dist. marked T I N R I E S 5 BT.

Land rolling.

Soil moss covered and frozen on glacial deposit.

Heavy spruce timber 80.00 chs.

Dense Undergrowth 80.00 chs.

N.89°56'E.on a random line bet,secs.4 and 9.

40.00 Set temp.¼ sec.cor.

80.14 Intersect N.and S.line at the cor.secs.3,4,9 and 10.

Thence I run

S.89°56'W.on a true line bet,secs.4 and 9.

Subdivision of T.I N,R.I E.

chains

Over level land.

Through heavy spruce timber and dense undergrowth and fallen timber.

26.24 Ascend gradually over E.slope of spur.

31.00 Top of spur bears N.10°E.and S.10°W.Descend.

34.34 Bottom of descent,creek5 lks.wide 2 ft.deep,clear cold water,stony bottom,course NE. Ascend steep S.slope on N.side of gulch.

40.07 Set an iron post 3 ft.long 1 in.in diam.26 ins in the ground for ¼ Sec.cor.marked on brass cap ¼ S 4 on N. half and S 9 on S.half;from which

An aspen 9ins.in diam.bears S.12°25'W.24 lks.dist. marked ¼ S 4 B T.

An aspen 8 ins.in diam.bears N.19°25'W.38 lks.dist. marked ¼ S 9 B T.

June 23 1911.

44.35 Top of steep slope.Thence ascend gradually.

80.14 The cor.secs.4,5,8 and 9.

Land level and rolling.

Soil vegetable mold 2 ft,deep,light and porous,on gravel deposit.

Heavy spruce and aspen timber 80.14chs.

Dense undergrowth 80.14 chs.

N.0°07'W.~~on a true line~~ bet.secs.4 and 5.

Descending N.slope of gulch.

Through heaavy spruce and aspen timber.and dense undergrowth

9.00 Creek 6 lks.wide 1 ft.deep pure,clear,water,rocky bottom course NE.Leave heavy spruce and aspen timber bears NE.and SW. Ascend abruptly steep cut bank on N.side gulch.

13.24 Top of cut bank 75 ft.above creek,enter heavy spruce and aspen timber bears NE.and SW.Thence over rolling land.

14.80 Indian trail bears E.and W.leads from goverhment road to Copper river.

Subdivision of T.I N.R.I E.

chains
40.00 Set an iron post 3 ft. long 1 in.in diam.26 ins.in the ground for ¼ sec.cor.marked on brass cap ¼ S 5 on W.half and S 4 on E.half;from which.

A spruce 8 ins.in diam. bears S.52°W.16 lks.dist. marked ¼ S 5 BT.

A spruce 24 ins.in diam.bears N.72°05'E.21 lks.dist. marked ¼ S 4 B T.

Descend gradually over NE,slope.

45.00 Descend abruptly over NE.slope bears NW.and SE.

68.34 Indian trail to Copper Center bears NW.and SSE.

68.74 Set a granite river boulder 20 x 8 x 6 ins.15 ins.in the ground for witness cor to meander cor. of frac.secs. 4 and 5.Marked W C M C on N.face with 4 grooves on E.face;from which

A spruce 7 ins.in diam.bears S.24°36'E.65 lks.dist. marked T I N R I E S 4 W C M C B T.

A spruce 7 ins.in diam.bears N.70°55'W.12 lks.dist. marked T I N R I E S 5 W C M C B T.

71.20 Right bank Copper River Impracticable to establish meander corner of frac.secs.4 and 5 on account of the liability to destruction by ice.

Land rolling.

Soil moss covered and frozen on glacial deposit.

Heavy spruce and aspen timber 66.96 chs.

Dense undergrowth 71.20 chs.

June 24 - 1911.

Subdivision of T.I. N.R.I E.

chains.

June 1, ~~1911~~ at the standard corner secs.31 and 32 ~~Copper River Base~~ Line T I N R I E. in

Latitude 61°49'12"N. Longitude 145°16'54"W.

I observe the altitude of the suns center as follows;

Altitude

26°17' at 6hrs.45m.A.M.l.m.t.turn left to hub 2°09'

26°42' at 6hrs.48m.A.M.l.m.t.turn left to hub 2°56'

27°07' at 6hrs.51m.A.M.l.m.t.turn left to hub 3°43'

Mean time of observations 6hrs.48m.A.M.l.m.t.

Solution of 1st observation.

Declination corrected for change 4.49hrs.

Refraction for alt.1'49"

28°10'48" colat.	a.c.sin	0.325834
63°44'49" coalt.	a.c.sin	0.047281
68°01'52" codecl.		
2) 159°57'29"		
79°58'44" ½ S	sin ½ S	9.993324
68°01'52"		
11°56'52" ½ S-codecl.	sin	9.316013
		2) 19.682452
		9.841226 =

½ cosin
46°04'09"
2
92°08'18" azimuth from north.
S.87°51'42"E.course to sun.
2°09' angle bet.sun and hub.
96°00'42"
N.89°59'18"E.course to hub.

1st observation gives course N.89°59'18"E.
2nd observation gives course N.89°59'36"E.
3rd observation gives course N.89°59'12"E.
Mean of 3 observations N.89°59'22"E.

All lines deflected from the true meridian and carried by fore and back sights.

I commence at the standard corner secs.31 and 32 on the S.bdy.of Twp.which is a granite stone 12 x 9 x 6 ins. above ground firmly set, marked and witnessed as described by the surveyor general.

Thence I run

N.0°08'W.bet.secs.31 and 32.

Over rolling land.

Through heavy spruce timber, ~~Frozen~~ moss covered ~~land.~~

Subdivision of T.I N,R.I E.

chains

Descend gradual slope, Through dense undergrowth.

24.50 Creek 10 lks.wide 2 ft.deep,pure clear water,muddy bottom. Course S.80°E.

25.00 Bottom of descent bears NW.and SE.Thence over level land.

28.50 Creek 20 lks.wide 3 ft.deep,pure clear water,muddy bottom.Course S.80°E.

40.00 Set an iron post 3 ft.long 1 in.in diam.26 ins.in the ground for ¼ sec.cor.marked on brass cap ¼ S 31 on W.half and S.32 on E.half;from which

A spruce 8 ins.diam.bears N.83°W.86 lks.dist. marked ¼ S 31 B T.

A spruce 9 ins.in diam.bears S.78°15'E.72 lks.dist. marked ¼ S 32 B T.

45.00 Creek 3 lks.wide 1 ft.deep,pure clear water,muddy bottom. Course SE.

55.00 Leave heavy spruce timber;enter burned timber bears NW.and SE.

63.80 Creek 3 lks.wide 8 ins.deep,pure clear water,muddy bottom, course SE.

66.00 Creek 3 lks.wide,8ins.deep,pure clear water.muddy bottom, course SE.

68.00 Leave burned timber,enter heavy spruce timber bears NW. and SE.

75.50 Creek 15 lks.wide 3 ft.deep,pure clear water,muddy bottom, course SE.

80.00 Set an iron post 3 ft.long 3ins.in diam.24 size 2 ins.in the ground for cor.secs.29,30,31 and 32;marked on brass cap

T I N S 30 in NW.

R I E S 29 in NE.

S 32 in SE.and

S 31 in SW.quadrants;from which

A spruce 8 ins.in diam.bears N.76°15'E.2.61 chs.dist. marked T I N R I E S 29 B T.

A spruce 14 ins.in diam.bears S.80°30'E.2.81 chs.dist. marked T I N R I E S 32 B T .

Subdivision of T.I N,R.I E.

chains

A spruce 8 ins.in diam.bears S.56°05'W.28 lks.dist.

marked T I N R I E S 31 B T.

A spruce 14 ins.diam.bears N.58°50'W.1.82 chs.dist.

marked T I N R I E S 30 B T.

Land rolling and level.

Soil moss covered and frozen.

Heavy spruce timber 67.00 chs.Burned timber 13.00 chs.

Dense undergrowth 80.00 chs.

June 1 1911.

East on a random line bet.secs.29 and 32.

40.00 Set temp.¼ sec.cor.

80.00 Intersect N.and S.line 19 lks. S.of the cor.secs.28, 29,32 and 33.

Thence I run

S.89°52'W.on a true line bet.secs.29 and 32.

Over level swampy land,

Through aspen timber .

1.00 Leave heavy aspen timber bears NW.and SE.

24.50 Leave swampy land,enter heavy spruce timber bears N.10°W.and S.10°E.Ascend gradually through dense undergrowth of willows and young spruce.

35.00 Leave heavy spruce timber,enter burned timber and scattering green spruce timber.bears NW.and SE.

38.00 Top of ascent bears NW.and SE.Descend over rolling land.

40.00 Set an iron post 3 ft.long 1 in.in diam.26 ins.in the ground for ¼ sec.cor.marked on brass cap ¼ S 29 On N.half and S.32 on S.half;from which

A spruce 10 ins.in diam.bears S.64°34'E.67 lks.dist.

marked ¼ S 32 B T.

A spruce 10 ins.in diam.bears N.4°13'E.95 lks.dist.

marked ¼ S 29 B T.

50.00 Bottom descent,Leave burned timber enter swampy land,bears NE.and SW.

62.60 Branch of Willow creek15 lks.wide 3 ft.deep pure clear water,muddy bottom,course SE.

Subdivision of T.I N, R.I E.

chains

64.00 Leave swampy land, enter burned timber and scattering spruce timber bears N. and S.

80.00 The cor. secs. 29, 30, 31 and 32.

Land level and rolling.

Soil moss covered and frozen.

Heavy aspen timber 1.00 ch. Spruce timber 10.50 chs.

Burned timber 31.00 chs.

Dense undergrowthof willows. and youmg spruce 55.50 chs.

June 2 1911.

West on a random line bet, secs. 30 and 31.

40.00 Set temp. ¼ Sec. cor.

80.69 Intersect the ~~principal meridian~~ 19 lks. N. of the cor. secs. 25, 30, 31 and 36; which is a sand stone 7 x 6 x 4 ins above ground, firmly set, ~~and~~ marked and witnessed as described by the surveyor general.

Thence I run

N. 89°52' E. on a true line bet. secs. 30 and 31.

Over rolling land through heavy spruce timber and dense undergrowth.

34.00 Leave heavy spruce timber enter burned timber and scattering green spruce, bears N. and S.

40.09 Set an ~~post 3 ft. long 1 in. in diam.~~ for ¼ sec. cor. marked on brass cap; ¼ S 30 on N. half and S 31 on S. half; from which

A spruce 7 ins. in diam. bears S. 77°50' W. 6.49 chs. dist. marked ¼ S 31 B T.

A spruce 6 ins. in diam. bears N. 85°50' W. 5.98 chs. dist. marked ¼ S 30 B T.

64.00 West edge of swampy land bears NW. and SE. subject to overflow.

72.79 Branch of Willow creek 20 lks. wide 3ft. deep, clear pure water, muddy bottom, course SE.

73.20 East edge of swampy land subject to overflow, bears NW. and SE. Ascend gradually.

Subdivision of T.I N.R.I E.

chains

80.09 The cor.secs.29,30,31 and 32.

Land rolling.

Soil moss covered and frozen 1st 34.00 chs.Swampy 9.20chs. remaining 34.89 chs.vegetable mold light and porous 1 ft.deep.

Heavy spruce timber 34.00 chs.

Burned timber 46.09 chs.

Dense undergrowth 80.09 chs,

June 3 1911.

N.0°08'W.bet.secs.29 and 30.

Over rolling land.

through heavy spruce and aspen timber and dense undergrowth Descend gradually.

40.00 Set an iron post 3 ft. long 1 in.in diam.26 ins.in the ground for ¼ sec.cor.marked on brass cap ¼ S 30 on W. half and S 29 on E.half;from which.

An aspen 16 ins.in diam.bears S.16°00'W.64 lks.dist. marked ¼ S 30 B T.

An aspen 10 ins. in diam.bears S.74°45'E.46 lks.dist. marked ¼ S 29 B T.

49.50 Bottom of descent bears NW.and SE.Ascend gradually.

55.85 Creek 10 lks.wide 2ft.deep,clear pure water,muddy bottom course SE.

80.00 Set an iron post 3 ft.long 2 ins.in diam.24 ins.in the ground for the cor.secs.19,20,29 and 30.marked on brass cap;

T I N S 19 in NW.

R I E S 20 in NE.

S 29 in SE.and

S 30 in SW.quadrants;from which

An aspen 6 ins.in diam.bears N.50°45'E.55 lks.dist. marked T I N R I E S 20 B T.

An aspen 6 ins.in diam.bears S.25°05'E.82 lks.dist. marked T I N R I E S 29 B T.

Subdivision of T.I N.R.I E.

chains

An aspen 6 ins.in diam.bears S.37°05'W.35 lks.dist.
marked T I N R I E S 30 B T.
An aspen 6 ins.in diam.bears N.46°25'W.75 lks.dist.
marked T I N R I E S 19 B T.

Land rolling.

Soil vegetable mold 2 ft.deep light and porous,on glacial deposit.

Heavy spruce and aspen timber 80.00 chs.

DEnse undergrowth 80.00 chs.

June 12 , 1911.

N.89°52' E.on a random line bet.secs.20 and 29.

40.00 Set temp.¼ sec.cor.

80.08 Intersect N.and S.line 5 lks.S.of the cor. of secs. 20,21,28 and 29.

Thence I run

S.89°50'W.on a true line bet.secs,20 and 29.

Over level land.

Through heavy spruce and aspen timber and dense undergrowth

40.04 Set an iron post 3 ft.long 1 in.in diam.26 ins.in the ground for ¼ sec.cor.marked on brass cap ¼ S 20 on N.half and S 29 on S.half;from which

An aspen 14 ins.in diam.bears N.31°30'E.28 lks.dist.
marked ¼ S.20 B T.
An aspen 12 ins.in diam.bears S.36°30'W.35 lks.dist.
marked ¼ S 29 B T.

80.08 The cor.secs.19,20,29,and 30.

Land level.

Soil vegetable mold,2ft.deep,light and porous.

Heavy spruce timber.80.08 chs.

Dense undergrowth 80.08 chs.

June 13,1911.

Subdivision of T.I N.R.I E.

chains.

S.89°52'W.on a random line.bet.secs.19 and 30.

40.00 Set temp.¼ sec.cor.

80.00 Intersect principal meridian 32 lks.S.of the cor.secs. 19,24,25 and 30;which is a slate stone 6 x 10 x 3 ins. above ground,firmly set,marked and witnessed as described by the surveyor general.

Thence I run

S.89°54'E.on a true line bet.secs.19 and 30.

Over rolling land.

Descend gradually throuhg heavy spruce timber.and dense undergrowth.

4.00 Leave heavy spruce timber enter burned timber bears N.and S.

7.00 Leave burned timber enter heavy spruce timber bears N.andS.

12.50 N.edge shallow lake or pond bears S.2 chs.dist.

16.00 Leave heavy green spruce timber enter burned timber bears N.and S.

34.50 Leave burned timber enter heavy green spruce timber bears N.and S.

40.00 Set an iron post 3 ft.long 1 in.in diam 26 ins.in the ground for ¼ sec,cor.marked on brass cap ¼ S 19 on N. half and S 30 on S.half;from which

A spruce 8 ins.in diam.bears S.15°50'E.21 lks.dist. marked ¼ S 30 B T.

An aspen 10 ins.in diam.bears N.8°30'W.38 lks.dist. marked ¼ S 19 B T.

49.45 Creek 2 lks.wide 1ft.deep,pure clear water,muddy bottom course N.Bottom of descent bears N.and S. Thence over level land.

51.10 Leave heavy spruce and aspen timberbears N.and S.

53.35 Same creek course S.into small lake.

57.50 N.edge of circular lake or pond bears S.2 chs.dist. contains about 1 acre.

Enter heavy green spruce and aspen timber bears N.and S.

80.00 The cor secs.19,20,29 and 30.

Land rolling and level.

Subdivision of T.I N,R.I E.

chains

Soil vegetable mold,2ft.deep,light and porous,on glacial deposit.

Heavy spruce and aspen timber52.10 chs.

Dense undergrowth 80.00chs.

June 14,1911

N.0°08'W.bet.secs.19 and 20.

Over rolling land.

Through heavy spruce and aspen timber and dense undergrowth.

40.00 Set an iron post 3 ft.long 1 in.in diam.26 ins.in the ground for ¼ sec,cor.marked on brass cap ¼ S 19 on W.half and S 20 on E.half;from which

A spruce 10 ins.in diam.bears S.44°10'E.31 lks.dist. masked ¼ S 20 B T.

A spruce 9 ins.in diam.bears S.46°55'W.36 lks.dist. marked ¼ S 19 BT.

45.00 Top of ascent bears E.and W.Begin gradual descent.

80.00 SEt an iron post 3 ft.long 2 ins.in diam.24 ins.in the ground for cor.secs.17,18,19 and 20 marked on brass cap

T I N S 18 in NW.

R I E S 17 in NE.

S 20 in SE.and

S 19 in SW.quadrants;from which

A spruce 24 ins.in diam.bears N,23°10'E.88 lks.dist. marked T I N R I E S 17 B T.

A spruce 20 ins.in diam.bears S.46°30'E.64 lks.dist, marked T I N R I E S 20 B T .

A spruce 20 ins.in diam.bears S.76°47' W.49 lks.dist. marked T I N R I E S 19 B T.

A spruce 6 ins.in diam.bears N.33°03'W.38 lks.dist. marked T I N R I E S 18 B T.

Land rolling.

SOil moss covered and frozen.

Heavy spruce and aspen timber 80.00 chs.

Dense undergrowth 80.00 chs.

June 16,1911.

Subdivision of T.I N.R.I E.

chains

N.89°50'E.on a random line bet,secs.17 and 20.

40.00 Set temp.¼ sec.cor.

80.00 Intersect N.and S.line 12 lks.N.of cor.secs.16,17,20and 21.

Thence I run

S.89°55'W.on true line bet.secs.17 and 20.

Over level moss covered land.

Through heavy spruce timber and dense undergrowth.

2.30 Leave heavy spruce timber and moss covered land,enter burned timber bears N.and S.

6.50 Leave burned timber enter heavy spruce timber bears N.and S.

8.50 Leave heavy spruce timber enter burned timber bears NW. and SE.

40.00 Set an iron post 3 ft,long 1 in.in diam.26 ins.in the ground for ¼ sec.cor.marked on brass cap.¼ S 17 on N.half and S 20 on S.half; digs pits 18 x 18 x 12 ins. E. and W.of post 3 ft.dist.and raise a mound of earth 3½ ft.base 1½ ft.high N.of cor.

55.00 Leave burned timber enter heavy spruce timber bears NW. and SE.

80.00 The cor.secs.17,18,19,and 20.

Land level.

Soil moss covered and frozen 1st 2.30 chs.and last 25.00 chs.,remaining 52.70 chs.vegetable mold 2 ft. deep,light and porous.

Heavy spruce timber 29.30 chs.

Burned timber 50.70 chs.

Dense undergrowth.80.00chs.

June 17,1911.

N.89°54'W.on a random line bet.secs.18 and 19.

40.00 Set temp.¼ sec.cor.

79.80 Intersect ~~principal meridian~~ the W. bdy. of Tp. at the cor.of secs.13,18,19, and 24,which is a slatestone 18 x 6 x 3 ins.above ground,firmly set,marked and witnessed as described by the surveyor general.

Subdivision of T.I N, R.I E.

chains

Thence I run

S.89°54'E.on a true line bet,secs.18 and 19.

Over level land.

Through heavy spruce timber and dense undergrowth.

25.60 Log road bears S.40°W.to mail cabins in sec.19 and N.40°W. about 15.00 chs.

39.80 Set an iron post 3 ft.long 1 in.in diam.26 ins.in the ground for ¼ sec.cor.marked on brass cap ¼ S 18 onN. half and S 19 on S.half;from which

A spruce 8 ins.in diam.bears N.17°40'E.49 lks.dist. marked ¼ S 18 B T.

A spruce 8 ins.in diam/bears S.0°30'W.34 lks.dist.marked ¼ S 19 B T.

79.80 The cor.secs.17,18,19 and 20.

Land level.

Soil moss covered and frozen.

Heavy spruce timber 79.80 chs.

Dense undergrowth 79.80 chs.

June 19,1911

N.0°8'W.bet.secs.17 and 18.

Over level land.

Through heavy spruce timber and dense undergrowth.

23.40 Leave heavy spruce timber ,enter burned timber bears E.and W.

31.10 Leave burned timber,enter heavy spruce timber bears E.and W.

38.20 Leave heavy spruce timber,enter burned timber and scattering green spruce timber bears E.and W.

40.00 Set an iron post 3 ft.long 1 in.in diam.26 ins.in the ground for ¼ sec.cor.marked on brass cap ¼ S 18 on W half and S 17 on E.half;from which

A spruce 9 ins.in diam.bears N.43°10'W.90 lks.dist; marked ¼ S 18 B T.

A spruce 24 ins.in diam.bears S.19°35'E.2.55 lks. marked ¼ S 17 B T.

Subdivision of T.1 N.R.1 E.

chains

41.00 Leave burned and scattering spruce timber enter heavy spruce timber bears E.and W.

43.20 Leave heavy spruce timber enter burned timber bears E.and W.

53.00 Leave burned timber bears E.and W.

57.70 Enter heavy spruce timber bears E.and W.

80.00 Set an iron post,3 ft.long 2 ins.in diam.24 ins.in the ground for cor. secs. 7,8,17 and 18 marked on brass

c cap T I N S 7 in NW.

R I E S 8 in NE.

S 17 in SE.and

S 18 in SW.quadrants;from which

A spruce 14 ins.in diam.bears N.74°46'E.31 lks.dist. marked T I N R I E S 8 B T.

A spruce 8 ins.in diam.bears S.36°35'E.29 lks.dist. marked T I N R I E S 17 B T.

A spruce 10 ins.in diam.bears S.68°32'W.81 lks,dist. marked T I N R I E S 18 B T.

A spruce 10 ins.in diam.bears N.31°24'W.95 lks.dist. Marked T I N R I E S 7 B T.

Land level.

Soil vegetable mold 2 ft.deep light and porous.

Heavy green spruce timber 55.00 chs.Burned timber 17.50 chs/

Dense undergrowth 80.00 chs.

N.89°55'E.on a random line bet.secs.8 and 17.

40.00 Set temp.¼ sec.cor.

80.00 Intersect N.and S.line 4 lks.S.of the cor.secs.8,9,16 and 17.

Thence I run

S.89°53'W.on a true line bet.secs.8 and 17.

Over level land.

Through heavy spruce timber and dense undergrowth.

12.42 Government wagon road bears N.20°W.and S.20°E.leads from Valdez to Fairbanks.

Subdivision of T.I N.R.I E.

chains.

40.00 Set an iron post 3 ft.long 1 in.in diam.26 ins.in the g ground for ¼ sec.cor.marked on brass cap ¼ S 8 on N. half and S.17 on S.half;from which

A spruce 20 ins.in diam.bears N.30°15'E.35 lks.dist. marked ¼ S 8 B T.

A spruce 20 ins.in diam.bears S.40°05'W. 62 lks.dist. marked ¼ S 17 B T.

June 21,1911.

53.90 Military telegraph line bears N.50°W.and S.50°E.

55.70 Old pack trail bears N.50°W.and S.50°E.not in use.

62.50 Leave heavy spruce timber enter burned timber bears NW.and SE.

77.20 Leave burned timber enter heavy green spruce timber bears NW.and SE.

80.00 The cor.secs.7,8,17 and 18.

Land level.

Soil moss covered and frozen.

Heavy spruce timber 65.30 chs.Burned timber 14.70 chs.

Dense undergrowth 80.00 chs.

N.89°54'W.on a random line bet.secs.7 and 18.

40.00 Set temp.¼ sec.cor.

79.61 Interdect ~~principal meridian~~ 9 lks.S.of cor. secs.7,12, 13 and 18. which is a slatestone 7 x 6 x4 ins.above ground firmly set marked and witnessed as described by the surveyor general.

Thence I run

S.89°50'E.on a true line bet.secs.7 and 18.

Over level land.

Through heavy spruce timber and dense undergrowth.

7.10 Leave heavy spruce timber enter burned timber bears N. and S.

21.10 West edge of a shallow lake or pond,extends N.1.00ch. and S.50 lks. Thence across lake.

22.50 East edge of lake.Enter burned timber bears N.and S.

Subdivision of T.1 N.R.1 E.

chains
32.00 Leave burned timber enter heavy spruce and aspen timber bears N.and S.

39.61 Set an iron post 3 ft.long 1 in.in diam.26 ins.in the ground for ¼ sec.cor.marked on brass cap ¼ S 7 On N. half and S 18 on S.half;from which
A spruce 8 ins.in diam.bears S.22°25'E.30 lks.dist. marked ¼ S 18 B T.
An aspen 6 ins.in diam.bears N.27°35'W.15.1ks.dist. marked ¼ S 7 B T.

47.60 West edge of swampy ground,leave heavy spruce timber, bears N.and S.thence across swamp.

50.20 East edge of swampy ground,enter heavy spruce timber bears N.and S.

79.61 The cor.secs.7,8,17 and 18.
Land level.
Soil moss covered and frozen.
Heavy spruce timber 51.95 chs.Burned timber 23.50 chs.
Swampy land 2.60 chs.Lake 2.40 chs.
Dense undergrowth 77.31 chs.

June 22,1911.

N.0°08'W.bet.secs.7 and 8.
Over level land.
Through heavy spruce timber and dense undergrowth.

6.80 Leave heavy spruce timber enter burned timber and scattering green spruce bears E.and W.

31.10 Military telegraph line bears N.44°W.andS.44°E.

40.00 Set an iron post 3 ft,long 1 in.in diam.26 ins.in the ground for ¼ Sec.cor.marked on brass cap ¼ S 7 on W. half and S 8 on E.half;from which
A spruce 6 ins.in diam.bears S.39°15'E.3.17 chs.dist. marked ¼ S 8 B T.
A spruce 6 ins.in diam.bears S.70°00'W.1.62 chs.dist. markedc¼ S 7 B T.

42.35 Old pack trail bears N.44°W.and S 44°E.

44.00 Enter swampy land bears NW.and SE.

51.80 Leave swampy land bears NW.and SE.

Subdivision of T. I N, R. I E.

chalns

55.90 Leave burned timber and scattering spruce timber, enter heavy green spruce timber bears NE.and SW.

80.00 Set an iron post 3 ft.long 2 ins.in diam.24 ins.in the ground for the cOr.secs.5,6,7 and 8 marked on brass cap

T I N S 6 in NW.

R I E S 5 in NE.

S 8 in SE.and

S.7 in SW.quadrants;from which

A spruce 14 ins.in diam.bears N.42°10'E.42 lks.dist. marked T I N R I E S 5 B T.

A spruce 10 ins.in diam.bears S.64°E.77 lks.dist. marked T I N R I E S 8 B T.

A spruce 14 ins.in diam.bears S.79°30'W.34 lks.dist. marked T I N R I E S 7 B T.

A spruce 10 ins.in diam.bears N.32°45'W.79 lks.dist. marked T I N R I E S 6 B T.

Land level.

SOIL moss covered and frozen 1st.6.80 chs.and last 24.10 chs.Remaining 49.10 chs.vegetable mold 2 ft. deep light and porous.

Heavy spruce timber 30.90 chs.Burned timber 49.10 chs.

Dense undergrowth 80.00 chs.

N.89°53'E.on a random line bet.secs.5 and 8.

40.00 Set temp.¼ Sec.cor.

80.02 Intersect N.and S.line at the cor,secs.4,5,8 and 9.

Thence I run

S.89°53'W.on a true line bet.secs.5 and 8.

Through heavy spruce timber and dense undergrowth.

Ascend gradually.

33.75 Creek 5 lks. wide 6 ins.deep course N.20°E.Pure clear water

36.50 Indian trail bears NE.and SW.Leads from Government wagon. road to copper river.

40.01 Set an iron post 3 ft.long 2 ins.in diam.26 ins.in the ground for ¼ sec.cor.marked on brass cap ¼ S 5 on N.

Subdivision of T.1 N,R.1 E.

Chains

half and S 8 on S half;from which

A spruce 10 ins.in diam.bears N.3°26'E.26 lks.dist.

marked ¼ S 5 B T.

A spruce 10 ins.in diam.bears S.3°40'E.18 lks.dist.

marked ¼ S 8 B T.

42.40 Government wagon road leads from Valdez to Fairbanks bears N.19°30'W.and S.19°30'E.

69.10 Leave heavy spruce timber enter burned timber bears NE.and SW.

71.10 Leave burned timber enter heavy spruce timber bears NE. and SW.

80.02 The cor.secs.5,6,7 and 8.

Land rolling.

SOil moss covered and frozen.

Heavy spruce timber 78.02 chs.Burned timber 2.00 chs.

Dense undergrowth 80.02 chs.

June 26,1911.

N.89°50'W.On a random line bet secs.6 and7.

40.00 Set temp.¼ sec.cor.

68.26 E.edge of pond.Set temp.Witness corner to cor.secs. 1,6,7 and 12.Offset South 2.00 chs.Thence N.89°50'W. on offset line 11.21 chs.

79.47 Intersect ~~Principal Meridian~~ 10 lks.S.of the witness corner to secs.1,6,7 and 12;which is a granite stone 7 x 4 x 7 ins.above ground firmly set,marked and witnessed as described by the surveyor general.

Thence I run S.89°46'E.on offset line south of sec.6 11.21chs.

Thence North 2.00 chs.to the line bet.secs.6 and 7 ~~making~~

11.21 Set an iron post 3 ft.long 3 ins.in diam.24 ins.in the ground for witness corner to cor,secs.1,6,7, and 12 marked on brass cap

Subdivision of T.I N.R.I E.

Chains

T I N S 1 in NW.

R I E S 6 in NE.

S 7 W C in SE.and

S 12 in SW.quadrants;from which

A spruce 10 inslin diam.bears N.43°E.3.37 chs.dist.

marked W C T I N R I E S 6 B T.

A spruce 10 ins.in diam.bears S.40°05'E.1.26 chs.dist.

Marked W C T I N R I E S 7 B T.

A spruc 10 ins.in diam.bears S.27°05'W.3.56 chs.dist.

marked W C T I N R I W S 12 B T.

A spruce 10 ins.in diam.bears N.40°10'W.4.06 chs.dist.

marked W C T I N R I W S 1 B T.

Thence S.89°46'E.bet.secs.6 and 7.

Over level land.

Through heavy spruce timber and dense undergrowth.

27.77 Military telegraph line bears N.55°W.and S 55°E.

39.47 Set an iron post3 ft.lomg 1 in.in diam.26 ins.in the ground for ¼ sec.cor.marked ¼ S 6 on N.half and S 7 onS.half;from which

A spruce 8 ins.in diam.bears N.50°05'W.14 lks.dist.

marked ¼ S 6 B T.

A spruce 8 ins.in diam.bears S.3°00'W.38 lks.dist.

marked ¼ S 7 B T.

47.50 Leave heavy spruce timber enter burned timber bears N.and S.

57.30 Leave burned timber enter heavy spruce timber bears N.and S.

79.47 The cor secs.5,6,7 and 8.

Land level.

Soil moss covered.1st.47.50 chs.and last 22.17 chs.

Remaining 9.80 chs.vegetable mold 2 ft.deep light and porous on glacial deposit.

Heavy spruce timber 58.46 chs.Burned timber 9.80 chs.

Dense undergrowth 68.26 chs.

Subdivision of T.I N.,R.I E.

chains

N.0°08'W.on a random line bet.secs.5,and6.

40.00 Set temp.¼ sec.cor.

80.30 Intersect N.Bdy.Tp.at the cor.secs.5,6,31 and 32.

Thence I run

S.0°08'E.on atrue line bet.secs.5 and 6.

Over level land.

Through heavy spruce timber and dense undergrowth,

19.10 Leave heavy spruce timber enter burned and scattering green spruce timber bears NE.and SW.

40.30 Set an iron post 3 ft.long 1 in.in diam.26 ins.in the ground for ¼ sec.cor.marked on brass cap ¼ S 6 On W. half and S 5 on E.half;from which

A spruce 7 ins.in diam.bears S.47°E.65 lks.dist. marked ¼ S 5 B T.

A spruce 7 ins.in diam.bears S.36°40'W.80 lks.dist. marked ¼ S 6 B T.

64.70 Leave burned and scattering green spruce timber enter ~~the~~ heavy spruce timber bears E.ahd W.

80.30 The cor.secs.5,6,7 and 8.

Land level.

Soil vegetable mold 2 ft.deep.light and porous on glacial deposit.

Heavy spruce timber 34.70 chs.Burned timber 45.60 chs.

Dense undergrowth 80.30 chs.

June 27,1911.

H. Wilson Williamson

Meanders, T.1 N.,R.1 E.

Meanders of the right bank of Copper River,down stream.

I commence at the true point for meander corner of frac. secs,5 and 32 on N.Bdy.of Tp.

At this corner June 28,~~1911~~,I determine atrue meridian by by observing the suns center as follows;Mean time of the observations ~~being~~ 6 hrs.34 min.41 secs.A.M.l.m.t.

Altitude		angle
22°35'	turn right to tree on left bank river	7°31'
23°51'	turn right to tree on left bank river	5°12'
24°40'	turn right to tree on left bank river	3°41'
25°39'	turn right to tree on left bank river	1°52'

In latitude 61°54'24"N. Longitude 145°15'27"W.

Solution of flrst observation.

Declination corrected for change 4.26 hrs.

Refraction for altitude 2'03"

28°05'36"	co-lat.	a.c.sin	0.327063
67°27'11"	co-alt.	a.c.sin	0.034532
66°40'32"	co-decl.		
2)162°13'19"			
81°06'39"	½ S.	sin	9.994752
66°40'32"			
14°26'07"	½ S - co-decl.	sin	9.396698
			2)19.753045
			9.876522

½ co-sin 41°11'25"
2
82°22'50" azimuth from north.or

N.82°22'50"E. course to sun.
7°31'00" angle bet.sun and tree.
N.89°53'50"E. course to tree.

1st observation gives course	N.89°53'50"E.
2nd observation gives course	N.89°54'42"E.
3rd observation gives course	N.89°54'08"E.
4th observation gives course	N.89°54'36"E.
Mean of 4 observations	N.89°54'19"E.

All lines deflected from the true meridian and carried by fore and back sights.

The magnetic bearing of the true meridian at 6:45 A.M.l. m.t. is N.30°15'W.which gives fhe mag.decl.30°15'E.

Thence I run with meanders in sec,5

Over rolling land along gravelly beach at foot of steep NE. slope.

S.60°56'E. 5.90 chs.

Meanders in T.I N.,R.I E.

Meanders of right bank of Copper River,down stream.

S.68°04'E. 16.10 chs. To meander corner of frac.secs. 4 and 5.

Land rolling.

Soil bare sliding bluffs without soil.

No timber.

Thence in sec.4

Over rolling land along gravelly beach at foot of steep NE.slope.

S.71°15'E.	6.00 chs.	
S.85°58'E.	13.59 "	
S.77°35'E.	2.40 "	At end of this course enter heavy spruce timber and dense undergrowth bears W.
S.63°04'E.	2.73 "	Bank 15 ft.high.
S.58°41'E.	28.81 "	Bank 12 ft.high.Leave heavy spruce timber.
S.53°16'E.	16.93 "	
N.67°02'E.	6.99 "	Bank 8 ft.high. Indian house bears South 14.00 chs.dist.
S.69°21'E.	8.33 "	
S.56°57'E.	4.61 "	Bank 5 ft.high. To meander cor. frac.secs.3 and 4.

Land rolling.

Soil stony and gravelly.

Heavy spruce timber 31.54 chs.

Dense undergrowth 68.40 chs.

Thence in sec.3

Over level land through dense undergrowth.

S.52°06'E.	18.84 chs.	Bank 12 ft.high.
S.42°30'E.	3.91 "	
S.23°45'E.	1.43 "	
S.39°45'E.	5.41 "	
S.33°30'E.	4.19 "	

Meanders T.1 N, R.1 E.

Meanders of right bank of Copper River down stream.

S.20°00'E.	2.53 chs.	At end of this course an Indian cabin bears W.15.00 chs.dist.
S.37°30'E.	5.99 "	
S.42°00'E.	6.88 "	
S.15°00'E.	3.06 "	To meander cor.of frac.secs.3 and 10

Land level.

Soil alluvial, sandy and warm.

Dense undergrowth 38.95 chs.

Thence in sec.10/

Through dense undergrowth.

S.43°16'E.	10.53 chs.	Bank 14 ft.high.
S. 3°45'E.	7.06 "	At end of this course an indian cabin bears S.[illegible]4.00 chs.dist.
S.45°45'E.	15.99 "	To angle in fence bears W.and S.
S.4° 00'E.	7.95 "	
S.10°15'W.	9.68 "	At end of this course an indian cabin bears S.55°W.9.00chs.dist.
S.14°00'W.	19.58 "	
S. 6°16'E.	17.70 "	To meander cor.of frac.secs.10 and 15.

Land level.

Soil alluvial not subject to overflow, sandy and warm. Well drained.

Dense undergrowth 79.92 chs.

Thence in sec.15.

Through dense undergrowth.

S.20°21'E.	5.34 chs.	Bank 12 ft.high.
S.49°30'W.	3.78 "	
S.25°00'E.	26.45 "	Leave dense undergrowth.
S.71°00'E.	6.00 "	Bank 300 ft.high
S.65°00'E.	13.29 "	
S.59°22'E.	4.05 "	To meander cor.of frac.secs. 14 and 15.

Meanders T.I N.,R.I E.

Meanders of right bank of Copper River,down stream.

Land -- 23.40 chs.steep river bluff.Balance level.

Soil washed away on river bluffs.Balance sandy loam warm and dry.

Dense undergrowth 35.57 chs.

Thence in sec.14.

Along foot of river bluffs.

S.67°33'E.	14.38 chs,	
S.64°22'E.	30.12 "	
S.75°18'E.	23.08 "	
S.60°50'E.	19.82 "	Bank 14 ft.high. At beginning of this course enter dense undergrowth. To meander cor.frac.secs.13 and 14. Indian cabin bears W.4.60 chs.

Land steep river bluff,stony.

Soil 17.31 chs.alluvial,sandy and warm.

Dense undergrowth 17.31 chs.

Thence in sec.13.

Through dense undergrowth.

S.44°01'E.	6.60 chs.	Bank 12 ft.high. To meander cor. frac.secs.13 and 24.

Land level.

Soil sandy alluvial on subsoil of gravel boulders.

Dense undergrowth 6.60 chs.

June 30,1911.

Thence in sec.24.

Through heavy spruce timber.

S.44°30'E.	20.52 chs.	Bank 14 ft.high.
S.28°03'E.	18.08 "	
S.35°42'E.	21.71 "	
S. 2°25'E.	11.33 "	
S. 4°13'E.	20.35 "	To true point for meander cor.

Meanders of T.I N,R.I E.

Meanders of right bank of Copper River,down stream.

of frac.secs.24 and 25.

Land level and steep hillside.

Soil stony and gravelly.

Timber scattering spruce.

Thence in sec.25.

Through scattering spruce timber.

S.8° 00'W.	7.50 chs.	Ranks 16 ftlhigh.
S.15°45'E.	8.20 "	Along steep hillside.
S.67°30'E.	20.00 "	along steep bluffs.
S.83°51'E.	18.48 "	To true point for meander cor.
	54.18	of frac.secs.25 and 30.on E.bdy. Tp

Land stony and bluffs.

Soil bare sliding bluffs,without soil.

Timber scattering spruce.

July 1,1911 H Wilson Williamson
Transitman

Meanders of left bank of Copper River up stream.

June 28, ~~1911~~ At the meander cor.of frac.secs.25 and 30

On E.bdy.of tp.on left bank of Copper River I observe the altitude of the suns center and solve by the formula

$$\text{Co-sin } \tfrac{1}{2}PZS = \sqrt{\frac{\sin \tfrac{1}{2} S \times \sin(\tfrac{1}{2} S - \text{co-decl})}{\sin \text{co-alt.} \times \sin \text{co-lat.}}}$$

Where S = co-lat + co-alt. + co-decl.

Mean time of the observations ~~being~~ 8 hrs.6 m.6 secs.

A.M.l.m.t.
Latitude 61°51'16"N. Longitude 145°07'41"W.
Decl.corrected for change of 5.78 hrs.

Altitude

34°42' turn right to M C. on Right bank 74°10'

34°59' turn right to M C. on right bank 73°34'

Solution of first observation.

Refraction for altitude 1'16"

Meanders of T.I N.R.I E.

Meanders of left bank of Copper River,up straam.

28°08'46"	co-lat.	a.c.sin	0.326314
55°19'16"	co-alt.	a.c.sin	0.084941
66°40'41"	co-decl.		
2)150°08'43"			
75°04'21"	½ S.	sin	9.985091
66°40'41"			
8°23'40"	½ S - co-decl.	sin	9.164314
			2)19.560660
			9.780330 =

½ cosin 52°54'49"
2
105°49'38" azimuth from north.
S.74°10'22"E. course to sun.
74°10' angle bet.sun and M C on right bank.
S.0° 00'22"E. course to M C.

Lst observation gives course S.0°0'22"E.
2nd observation gives course S.0°0'08"W.
Mean of 2 observations S.0°0'07"E.

All lines deflected from the true meridian and carried by fore and back sights.

Thence I run with meanders in sec.25.

Through dense undergrowth.

S.85°00'W.	6.00 chs.	Banks 5 ft.high.
N.68°04'W.	10.74 "	Banks 20 ft.high. To meander cor. of frac.secs.24 and 25.

Land level.

Soil alluvial, sandy loam.

Dense undergrowth 16.74 chs.

Thence in sec.24.

Through dense undergrowth.

N.48°00'W.	3.11 chs.	Bank 16 ft.high.
N.36°37'W.	3.87 chs.	
N.35°25'W.	5.58 "	
N.24°13'W.	2.53 "	
N.39°01'W.	14.40 "	To mouth of Nadina creek,50 lks. wide course west,leave dense undergrowth.
N.0°02'E.	4.70 "	Enter scattering spruce timber and dense undergrowth.
N.25°26'E.	14.03 "	Indian cabin bears E.40 lks.dist.
N.21°01'W.	11.62 "	At 3.00 chs.mouth of creek course SW.

Meanders of T.I N.R.I E.

Meanders of left bank of Copper River,up stream.

N.7°.35'W.	10.58 chs.	Center low brushy island,6.00 chs. long 4.00 chs.wide,bears W. 5.00 chs.dist.inundated at high water.
N.31°59'W.	12.00 "	
N.30°00'W.	7.46 "	To meander cor.frac.secs.13 and24.

Land level.

Soil alluvial dry and sandy 2 ft.deep,lies on gravel bed.

Scattering spruce timber.

Dense undergrowth 85.18 chs.

June 28,1911.

Thence in sec.13.

Through dense undergrowth.

N.40°22'W.	15.77 chs.	Bank 14 ft.high.
N.51°15'W.	15.51 "	
N.74°00'W.	9.70 "	
N.60°09'W.	7.77 "	To meander cor. of frac.secs. 13 and 14.

Land along steep hillside.

Soil stony and gravelly,vegetable mold,wet and cold.

Dense undergrowth 48.75 chs.

Thence in sec.14 .

Through dense undergrowth.

N.63°04'W.	28.37 chs.	Banks 14 ft.high.
N.61°30'W.	6.08 "	Banks 10 ft.high.
N.84°58'W.	6.94 "	
N.61°12'W.	25.90 "	
N.75°42'W.	7.12 "	
N.59°28'W.	14.92 "	To meander cor.of frac.secs. 14 and 15.

Meanders of T.I N, R.I E.

Meanders of left bank of Copper River, up stream.

Land level.

Soil alluvial, sandy, dry and warm.

Dense undergrowth 38.18 chs.

No timber.

Thence in sec.15.

Through dense undergrowth and scattering spruce timber.

N.88°59'W.	3.19 chs.	Bank 5 ft.high.
N.45°00'W.	4.01 chs.	
N.33°51 W.	9.61 "	
N.17°57'W.	2.63 chs.	Bank 12 ft.high. To meander cor. of frac.secs.10 and 15.

Land level.

Soil gravel bars 16.81 chs. 2.63 chs.sandy loam.

Dense undergrowth 19.44 chs.

Thence in sec.10.

Through scattering spruce timber and dense undergrowth.

N.18°11'W	4.59 chs.	Bank 12 ft.high.An indian house bears N.45°E.60 lks.dist. also indian cache N.21°15'E. 5.50 chs.dist.and indian house N.13°15'E.2.50 chs.dist.
N. 6°25'W.	4.90 chs.	A cache bears N.2.00 chs.dist.
N. 0°51'E.	3.36 "	
N. 1°46'E.	7.13 "	
N. 4°42'W.	24.91 "	Bank 17 ft.high.An indian house bears E.60 lks.dist. At 14.00 chs.Leave dense undergrowth.
N.15°15'W.	8.45 "	
N.11°00'W.	8.06 "	Along steep bluff,300 ft.high.
N.19°00'W.	8.84 "	
N.19°15'W.	7.67 "	

Meanders of T. I N., R. I E.

Meanders of left bank of Copper River, up stream.

N.12°52'W. 3.87 chs. To meander cor. of frac. secs. 3 and 10.

Land leveland bluffs.

Soil sandy loam, 3 ft. deep 1st 53.34 chs. Balance is steep sliding bluffs with soil washed away.

Dense undergrowth 33.72 chs.

June 29, 1911.

Thence in sec. 3.

Along steep river bluff.

N.21°08'W.	3.31 chs.	
N.16°57'W.	15.63 chs.	
N.12°35'W.	3.54 "	
N.11°49'W.	8.62 "	Leave river bluffs.
N.64°22'W.	12.00 "	At 50 links mouth of creek, 20 lks wide, course south.
		At 1.00 chain enter dense undergrowth
N.29°48'W.	2.74 "	
N.62°00'W.	7.97 "	
N.72°06'W.	8.34 "	
N.50°35'W.	3.98 "	
N.39°25'W.	4.04 "	
N.20°59'W.	18.62 "	
N.56°47'W.	7.64 "	At 6.64 chs. creek 10 lks. wide course S. to meander cor. of frac. secs. 3 and 4.

Land river bluffs. and level.

Soil on river bluffs washed bare. Last 30.10 chs. sandy loam.

Dense undergrowth 30.10 chs.

Thence in sec. 4.

Through dense undergrowth.

Meanders of T.I N,R.I E.

Meanders of left bank of Copper River,up stream.

N.65°33'W.	9.16 chs.	
N.54°09'W.	3.28 "	
N.54°56'W.	3.80 chs.	
N.51°00'W.	1.79 "	To meander cor.of frac.secs. 4 and 33 on N.BDY.of TP.

Land level.

Soil sandy loam 3 ft.deep 18.03 chs.

Dense undergrowth 18.03 chs.

~~Thence in sec. 4.~~

I begin at the meander cor.of frac.secs. 4 and 33 on the N.Bdy.of Tp. which bears N.89°57'W.40.95 chs.from the cor.secs.3, 4, 33 and 34.

Thence with meanders in sec.4.

Through dense undergrowth.

S.76°15'W.	5.80 chs.	Bank 8 ft.high.
S.89°25'W.	2.75 "	Bank 12 ft.high.
N.78°00'W.	3.70 "	
N.83°13'W.	5.59 "	To meander cor. of frac.secs. 4 and 33 on N.Bdy.Tp.

Land level.

Soil alluvial light and sandy,subject to overflow.

Dense undergrowth 12.25 chs.

June 30, 1911.

J. Frank Wanner,

U.S.Surveyor.

General Description.

This township is nearly level throughout,the bluffs along the Copper River and a low range of hills in sec. 11 and 12 being the exceptions.

The soil of the bottom lands along Copper River is of alluvial deposit,fertile. The area is small.

The land on east side of Copper River, on the mesa which has a south exposure, and has been burned off, has gradually thawed out. Decayed vegetation has in some places created a soil which appears to be adapted for cultivation.

The land on the west side of Copper River is generally covered with spruce timber, some aspen and cottonwood about 8 ins. in diam. of little value with a dense tangle of undergrowth of willows and some brush. In the green timber the land is covered with a thick bed of moss. The land is frozen throughout the year except where fires have burned the timber.

There are several shallow ponds which can be drained scattered throughout the township. Copper River, ~~runs~~ through the NE. part of the township, average width about 20.00 chs., water rises about 14 ft. in summer, a swift muddy stream. River steamboats have run as far as Copper Center but the route was abandoned as impracticable owing to swift water and dangerous channel.

Willow creek in the SW. portion of the township overflows its banks in the summer months.

There is one settler living in sec. 34 who has probably 40 acres under cultivation. A crop of oats and hay was raised this season. This is one of the principal road houses on the Valdez Fairbanks road.

The climate is variable, and can be classed as semi-arid. Only a small fall of snow which disappears about the middle of May. Ice freezes on ponds as late as June 1; Frost every month of the year. During the middle of the summer days the heat is intense, the nights always cool.

J. Frank Warner,
U.S. Surveyor.

H. Wilson Williamson
Transitman

FINAL OATHS OF ASSISTANTS.

We hereby certify that we assisted F. Wilson Williamson, Transitman, in surveying all those parts or portions of the subdivision and meanders of T 1 N R 1 E, T 2 N R 1 E, T 2 N R 1 W, Resurvey Principal Meridian T 2 N Rs 1 E and 1 W, U. S. Military Reserve, School Reserve, and T 4 N R 1 W, of the Copper River base and Meridian in the District of Alaska, which are represented in the foregoing field notes as having been surveyed by him and under his direction, and that the said survey has in all respects, to the best of our knowledge and belief, been well and faithfully surveyed and the corner monuments established according to the instructions furnished by the Commissioner of the General Land Office.

C. G. Reiter	Chainman.
E. P. LeSeur	Chainman.
W. C. Spangler	Flagman.

Subscribed and sworn to before me this twenty-fifth day of August, 1911.

J. Frank Warner,
U. S. Surveyor.

We hereby certify that we assisted F. Wilson Williamson in surveying all those parts or portions of the subdivision and meanders of T 4 N R 1 W of the Copper River Base and meridian in the District of Alaska, which are represented in the foregoing field notes as having been surveyed by him and under his directions; that the 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 Commissioner of the General Land Office.

F. Henkel, Axeman.
W. J. Hamill, Axeman.

Subscribed and sworn to before me this twenty-first day of August, 1911.

J. Frank Warner,
U. S. Surveyor.

FINAL OATHS OF U. S. SURVEYOR AND ASSISTANTS.

LIST OF NAMES.

A list of the names of the individuals employed by J. Frank Warner, U. S. Surveyor, to assist in running, measuring and marking the lines and corners described in the foregoing field notes of the surveys of the subdivision and meanders of T 1 N R 1 E, T 2 N R 1 E, T 1 N R 1 W, T 4 N R 1 W, the Resurvey of Principal Meridian, through T 2 N, U. S. Military Reserve, School Reserve, showing the respective capacities in which they acted.

C.G.Reiter	Chainman.
E.P.LeSeur	Chainman.
W.C.Spangler	Flagman.
Frank Ryan	Axeman.
Fred Brown	Axeman.

FINAL OATHS OF ASSISTANTS.

We hereby certify that we assisted F. Wilson Williamson, Transitman, in surveying all those parts or portions of the subdivision and meander of T 1 N R 1 E, T 2 N R 1 E, T 2 N R 1 W, Resurvey Principal Meridian through T 2 N R 1 E and R 1 W, U. S. Military Reserve, School Reserve, T 4 N R 1 W, of the Copper River base and meridian in the District of Alaska, which are represented in the foregoing field notes as having been surveyed by him and under his direction, and that the said survey has -- 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 Commissioner of the General Land Office.

Frank Ryan, Axeman.

Fred Brown, Axeman.

Subscribed and sworn to before me this seventh day of August, 1911.

J. Frank Warner.

U. S. Surveyor.

CERTIFICATE OF ASSISTANTS.

We, the undersigned, hereby certify upon honor that we assisted, to the best of our skill and ability, F. WILSON WILLIAMSON, TRANSITMAN, ~~U. S. Surveyor,~~ during the periods and in the capacities stated opposite our several signatures, in surveying all those parts or portions of the subdivisions and meanders of T.1 N. R. 1 E. - T.2 N.R.1 E. - T.2 N.R.1 W. Resurvey of the Principal Meridian through T 2 N.R'S.1 E. and 1 W. U.S.Military Reserve School Reserve and T.4 N.R.1 W.

of the COPPER RIVER BASE AND Meridian, in the ~~State of~~ District of ALASKA which are represented in the foregoing field notes as having been executed 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 executed.

NAME.	PERIOD OF SERVICE.		CAPACITY.
	BEGUN.	ENDED.	
C. G. REITER	MAY 22, 1911	AUGUST 21, 1911	CHAINMAN.
E. P. LE SEUR	MAY 22, 1911	AUGUST 21, 1911	CHAINMAN.
W. C. SPANGLER	MAY 22, 1911	AUGUST 21, 1911	FLAGMAN.
FRED BROWN	MAY 22, 1911	AUGUST 7, 1911	AXMAN.
FRANK RYAN	MAY 22, 1911	AUGUST 7, 1911	AXMAN.
W. J. HAMILL	AUGUST 10, 1911	AUGUST 21, 1911	AXMAN.
F. HENKEL	AUGUST 10, 1911	AUGUST 21, 1911	AXMAN.

Subscribed and certified to before me on the dates of the final service as shown above.

6—2764

U. S. Surveyor.

FINAL OATH OF UNITED STATES SURVEYOR.

I, F. WILSON WILLIAMSON, TRANSITMAN, ~~U. S. Surveyor, do~~ solemnly swear that, in pursuance of special instructions received from the ~~U. S. Surveyor-General for~~ Commissioner General Land Off bearing date of the eighteenth day of April, 1911, I have well, faithfully, and truly, in my own proper person, and in strict conformity with said instructions, the Manual of Surveying Instructions, and the laws of the United States, surveyed all those parts or portions of subdivision and meanders of T.1 N.R.1 E. - T.2 N.R.1E. - T.2 N.R.1 W. - Resurvey of the Principal Meridian through T.2 N.R'S.1 E. and 1 W. U.S. Military Reserve School Reserve and T.4 N.R.1 W. of the Copper River base and Meridian, in the District of Alaska.

~~of the~~

~~Meridian, in the State of~~, which are represented in the foregoing field notes as having been executed 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 U. S. Surveyor General for ..... and in the specific manner described in the field notes, and that the foregoing are the original field notes of such survey.

F. Wilson Williamson
TRANSITMAN. ~~U. S. Surveyor.~~

Subscribed by said F. Wilson Williamson, and sworn to before me this twenty-fifth day of March, 1912

(Signed) Wm. L. Distin.
U. S. Surveyor General.

SEAL

APPROVAL.

OFFICE OF THE UNITED STATES SURVEYOR GENERAL,

....., 191

The foregoing field notes of the survey of .....

executed by .....

under his special instructions dated ....., 191 , having been critically examined, and the necessary corrections and explanations made, the said field notes, and the surveys they describe, are hereby approved.

U. S. 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.

U. S. Surveyor General.

6—2761

FINAL OATHS OF U. S. SURVEYOR AND ASSISTANTS.

LIST OF NAMES.

A list of the names of individuals employed by J. Frank Warner, U. S. Surveyor, to assist in running, measuring and marking the lines and corners described in the foregoing field notes of the surveys of the subdivision and meanders of T 1 N R 1 E, T 2 N R 1 W and T, 4 N,R,1 W, the U. S. Military, Agricultural Station and School Reserves, of the Copper River base and meridian in the District of Alaska, showing the respective capacities in which they acted.

F. R. Easterday	Chainman.
W. E. Wood	Chainman.
Alfred Rasmussen	Moundman Flagman.
W. F.O'Neil	Flagman.
G. C. Haneman	Axman.
Peter Henry	Axman.

FINAL OATHS OF ASSISTANTS.

I hereby certify that I assisted J. Frank Warner, U. S. Surveyor, in surveying all those parts or portions of the subdivisions and meanders of T,I N R 1 E, T 2 N R 1 W, U. S. Military Reserve and Agricultural Station Reserve, of the Copper River base and Meridian in the District of Alaska, which are represented in the foregoing field notes as having been surveyed by him and under his direction, and that the 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 Commissioner of the General Land Office.

W. F. O'Neill, Flagmen.

Subscribed and sworn to before me this seventh day of August, 1911.

J. Frank Warner,

U. S. Surveyor.

FINAL OATHS OF ASSISTANTS.

We hereby certify that we assisted J. Frank Warner, U. S. Survey, in surveying all those parts or portions of the subdivision and meander lines of T 1 N R 1 E, T 2 N R 1 W, T 4 N R 1 W, U. S. military reserves, Agricultural Sta. and School Reserves, Resurvey of the Principal Meridian in T 2 N. of the Copper River base and meridian in the District of Alaska, which are represented as having been survey by him and under his direction, and that the said survey has been in all respects, to the best of our knowledge and belief, well and faithfull y surveyed and the corner monuments established according to the instruction furnished by the Commissioner of the General Land Office.

F. R. Easterday	Chainman.
W. E. Wood	Chainman
Alfred Rasmussen	Flagman and Moundman.
G. C. Haneman	Axman.
Peter Henry	Axman.

Subscribed and sworn to before me this twenty-second day of August, 1911.

J. Frank Warner,
U. S. Surveyor.

CERTIFICATE OF ASSISTANTS.

We, the undersigned, hereby certify upon honor that we assisted, to the best of our skill and ability, J. Frank Warner, U. S. Surveyor, during the periods and in the capacities stated opposite our several signatures, in surveying all those parts or portions of subdivision and meanders of T. 1 N., R. 1 E., T. 2 N., R. 1 W., T. 4 N., R. 1 W., Military Reserves, Agricultural Experimental Station and School Reserves, in Tps. 2 N., Rs. 1 E. and R. 1 W. and T. 3 N., R. 1 W., of the Copper River Base and

~~of the~~ Meridian, in the ~~State of~~ District of Alaska which are represented in the foregoing field notes as having been executed 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 executed.

NAME.	PERIOD OF SERVICE.		CAPACITY.
	BEGUN.	ENDED.	
F. R. Easterday,	May 20, 1911	August 21, 1911	Chainman.
W. E. Wood,	May 20, 1911	August 21, 1911	Chainman.
Alfred Rasmussen,	May 20, 1911	August 21, 1911	Flagman and Moundman.
W. F. O'Neill,	May 20, 1911	August 7, 1911	Flagman.
G. C. Haneman,	May 20, 1911	August 21, 1911	Axman.
Peter Henry,	May 20, 1911	August 21, 1911	Axman.

Subscribed and certified to before me on the dates of the final service as shown above.

6—2764

U. S. Surveyor.

FINAL OATH OF UNITED STATES SURVEYOR.

I, J. Frank Warner, U. S. Surveyor, do solemnly swear that, in pursuance of special instructions received from the ~~U. S. Surveyor General for~~ Commissioner of the General Land Office bearing date of the eighteenth day of April, 1911, I have well, faithfully, and truly, in my own proper person, and in strict conformity with said instructions, the Manual of Surveying Instructions, and the laws of the United States, surveyed all those parts or portions of subdivisions and meanders of T. 1 N., R. 1 E., T. 2 N., R. 1 W., T. 4 N., R. 1 W., Military Reserves, Agricultural Experimental Station and School Reserves in Tps. 2 N., Rs. 1 E. and 1 W.

of the Copper River Base and Meridian, in the State of District of Alaska, which are represented in the foregoing field notes as having been executed 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 U. S. Surveyor General for and in the specific manner described in the field notes, and that the foregoing are the original field notes of such survey.

J. Frank Warner
U. S. Surveyor.

Subscribed by said J. Frank Warner, and sworn to before me this twenty-fifth day of March, 1912.

SEAL

Wm. L. Distin,
U. S. Surveyor General

APPROVAL.

OFFICE OF THE UNITED STATES SURVEYOR GENERAL,

JUNEAU, ALASKA, March 19th, 1914.

The foregoing field notes of the survey of the subdivision and meanders of Township No. 1 North, Range No. 1 East, of the Copper River Base and Meridian, in the Territory of Alaska

executed by J. Frank Warner, U.S. Surveyor & F. Wilson Williamson, Transitman under his special instructions dated April 18, 1911, having been critically examined, and the necessary corrections and explanations made, the said field notes, and the surveys they describe, are hereby approved.

Charles E. Davidson
U. S. Surveyor General.

~~The foregoing was copied from the original notes on file in this office.~~

~~U. S. Surveyor General.~~

6—2764

Bk.

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FIELD NOTES

OF THE SURVEY OF THE

EAST AND NORTH BOUNDARIES

of

TOWNSHIP No.1 NORTH, RANGE No.1EAST.

Of the COPPER RIVER BASE AND *Meridian,*

In the ~~TERRITORY OF~~ ~~DISTRICT~~ OF ALASKA

EXECUTED BY

J. FRANK WARNER U.S.SURVEYOR.

In the capacity of U. S. Surveyor, *under instructions dated* APRIL 18, *1911*, ~~issued by the United States Surveyor General to cover surveys included in Group No.~~ ~~, which were~~ *approved by the Commissioner of the General Land Office,* , *191*, *pursuant to authority contained in the Act of Congress dated* JUNE 25, *1910* and MARCH 4, 1911.

Survey commenced MAY 20, *1911*

Survey completed JUNE 3, *1911*

INDEX DIAGRAM.

Township 1 North, Range 1 East.

12	13	14	15	17	17	
6	5	4	3	2	1	9
7	8	9	10	11	12	8
18	17	16	15	14	13	7
19	20	21	22	23	24	6
30	29	28	27	26	25	4
31	32	33	34	35	36	3

6—151

East boundary of T.1 N., R.1 E

Survey commenced May 20, 1911 and executed with a Young & Sons light mountain transit and a Buff & Buff light mountain transit. The horizontal plates of each instrument read by opposite verniers to single minutes which is also the least count of the vertical circles. Both instruments were provided with prism for eye end of telescope and variation arc. The Buff & Buff transit was used on township boundaries and the Young & Sons on subdivision.

The adjustments of both transits were carefully verified or corrected. The plate bubbles, line of collimation, height of standards and zeros of vertical circles were each given proper attention. Measurements taken with sch. steel tape graduated to single minutes. Angles of slope taken with clinometer and reduced to horizontal.

Polaris is not visible at this season of the year.

In my camp on the Base Line 10 chs. East of the cor. of secs. 33 & 34 I determine the Latitude. At apparent noon May 20, 1911 with Buff & Buff transit I find the

Sun's altitude to be	48°	05'	00"
Less refraction			47
True altitude	48	04	13
Co-altitude	41	55	47.0
Declination corrected for 9.69 hrs.	19	53	16.7
Latitude of station	61°	49'	03.7"

This Latitude being about 1' greater than that given in the field notes of the Base Line I verify my determination at apparent noon May 21, 1911 using both transits to determine the altitude.

Altitude by Young transit	48°	17'	15"
Altitude by Buff transit	48	17	30
Mean of two transits	48	17	22
Less refraction			47
True altitude	48	16	35
Co-altitude	41	43	25.0
Decl. corrected for 9.69 hrs.	20	05	47.4
Latitude of station	61°	49'	12.4"

This result checks my previous determination.

At a point on the Base Line 1 ch. West of the cor. of secs. 33 & 34, ~~T 1 N~~ R 1 E I determine the Longitude.

at 8h	11m	03s PM 120th. mer. time altitude is	13°	36'	
8	13	24	13	18	
8	15	24	13	05	
8	17	52	12	50	
8	14	25.75 PM the mean altitude is	13°	12'	15"
Less refraction				3	55
True altitude			13	08	20

East boundary T1N, R1E.

Decl. corrected for 16.26 hrs. 19°56'47"

Lat.	61° 49' 12"	a c cosin	0.325834
Alt.	13 08 20		
Co-decl.	70 03 13	a c sin	0.026866
Sum	2/145 00 45		
½sum = S	72 30 22.5	cosin	9.476641
Alt.	13 08 20.0		
S - alt.	59 22 02.5	sin	9.934726
			2/19.764067
Sin ½ time expressed in arc.			9.882033
Local apparent time			6h 37m 13.40s
Less equation of time			3 40.58
Local Mean time			6 33 32.82
120th. Meridian time			8 15 24.75
Local Mean time			6 33 32.82
Difference in time			1h 41m 51.93s
Expressed in arc			25° 13' 14"
Added to			120 00 00
Longitude of station			145° 13' 14"

May 22, 1911 at the Standard Cor. of Ts. 1 N Rs. 1 & 2 E

I determine a true meridian by observing the altitude of the Sun's center and solving by the formula:-

$$\cos \tfrac{1}{2} PZS = \sqrt{\frac{\sin \tfrac{1}{2} S \sin (\tfrac{1}{2}S - \text{co-decl.})}{\sin \text{co-alt.} \sin \text{co-lat.}}}$$

In which S = co-decl. + co-alt. + co-lat.
Lat. 61° 49' 12" N. Long. 145° 07' 45"

Alt.		L.M.T.		Angle.
31° 11'	AM	8h 31m 49s	turn Right to tack	60° 40'
31 37	"	8 35 19	"	59 45
31 52	"	8 37 46	"	59 13
32 06	"	8 39 54	"	58 43

Declination figured for change of 5.71 hrs.
Refraction 1' 29"

Solution of First observation.

Co-Lat.	28° 10' 48"	a c sin	0.325834
Co-decl.	69 44 03		
Co-alt.	58 50 29	a c sin	0.067659
Sum	2/156 45 20		
½ sum	78 22 40	sin	9.991003
Co-decl.	69 44 03		
½S-co-dec.	8 38 37	sin	9.176923
½ PZS	52 52 33	$\cos^2 \frac{1}{2}$ PZS	19.780709
Azimuth from North		105° 45' 06"	
Course to Sun		S 74 14 54 E	
Angle bet. Sun and tack		60 40	
Course to tack first		S 13 34 54 E	
Second observation		13 34 36	
Third observation		13 34 32	
Fourth observation		13 34 24	
Mean of four obs.		S 13° 34' 36" E	

The magnetic bearing of the true meridian at 8:45 AM is N 30° 15' W and the angle thus determined gives the magnetic declination 30° 15' E.

East boundary T.1 N.,R.1 E

Chains I begin at the Standard cor. of T 1 N Rs 1 & 2 E which is a granite stone, 6x10 ins. 8 ins. above ground, firmly set and marked and witnessed as described by surveyor-general.

Thence I run

North bet. secs. 31 & 36

Over level land through scattering undergrowth.

1.57 Government wagon road from Chitina to Fairbanks bears NW & SE. Enter dense undergrowth bears E & W.

8.50 South side of grassy pond bears NW 20 chs. and SE 40 chs. Average width 8 chs. Water, shallow.

10.00 North side of same pond bears E & W.

12.00 Enter heavy spruce timber bears NW & SE.

40.00 Set an iron ~~post~~, ~~3 ft. long~~, 1 ~~in. in~~ diam. 26 ins. in the ground, for ¼ sec. cor. ~~mkd. on brass~~ cap, ¼ S 36 on W half and S 31 on E half, from which

A spruce, 10 ins. diam. bears N72°15'W 32 lks. dist. mkd. ¼ S 36 B T.

A spruce, 9 ins. diam. bears N68°35'E 32 lks. dist. mkd. ¼ S 31 B T.

44.30 Leave spruce timber, bears NE & SW.

44.40 Southeast shore of shallow pond, bears NE & SW.

45.25 North side of same pond, bears NW & SE.

This pond extends about 30 chs. W and is about 15 chs. in width N & S.

47.00 Enter spruce timber, bears NW & SE.

54.00 Leave green timber and enter standing dead timber and windfall, bears NW & SE.

80.00 Set an iron ~~post~~, ~~3 ft. long~~, ~~3 ins. in diam.~~ 24 ins. in the ground for cor. of secs. 25, 30, 31 & 36 ~~mkd.~~ on ~~brass~~ cap

T 1 N S 25 ~~in~~ NW
R 2 E S 30 in NE
S 31 in SE and
R 1 E S 36 in SW quadrant.

Dig pits, 18x18x12 ins. in each sec. 5½ ft. dist. and raise a mound of earth, 4 ft. base, 2 ft. high W of

East boundary T. 1 N, R. 1 E.

Chains

cor.

Land, level and rolling.

Soil, vegetable mould, 2 ft. deep, light and porous for first 10 chs. and last 26 chs. Balance of mile frozen and covered with moss.

Timber, spruce 39.30 chs. dead 26.00 chs.

May 22, 1911.

North bet. secs. 25 & 30.

Over nearly level land in burned timber through dense undergrowth of willows and young spruce timber.

15.55 Begin to descend from bench land, bears NW & SE.

30.00 Enter spruce timber, bears NW & SE.

40.00 Set an iron post, 3 ft. long, 1 in. in diam. 26 ins. the ground for ¼ sec. cor. mkd. on brass cap ¼ S 25 on W half and S 30 on E half, from which

Spruce, 16 ins. diam. bears N59°00'E 22 lks. dist. mkd. ¼ S 30 B T.

Spruce, 8 ins. diam. bears S22°00'W 18 lks. dist. mkd. ¼ S 25 B T.

52.99 Top of river bluff, bears E & W. ~~As it is~~ impracticable to establish a meander cor. on the river bank on account of its being steep, ~~therefore~~ at this point I set an iron post, 3 ft. long, 3 ins. diam. 24 ins. in the ground for witness cor. to meander cor. of fracl. secs 25 & 30, mkd. on brass cap

T 1 N W C M C in NE

R 2 E S 30 in SE and

R 1 E S 25 in SW quadrant; from which

A spruce, 8 ins. diam. bears S70°30'W 49 lks. dist. mkd. T 1 N R 1 E S 25 WC MC BT.

A spruce, 8 ins. diam. bears S87°15'E 27 lks. dist. mkd. T 1 N R 2 E S 30 WC MC BT.

Leave a flag at this witness cor.

55.12 Ordinary high water mark of Copper River, 100 ft. below

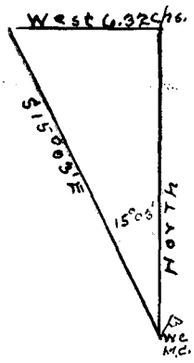
East boundary T.1 N.,R.1 E.

Chains

witness cor. Impracticable to establish meander cor.

Course of river, East.

Set flag across river on left bank. To determine the dist. across Copper River I go to the flag on left bank and run a base line West 6.32 chs. to a point from which the flag at the witness cor. on right bank bears S15°03'E. Therefore the distance is cotan 15°03' or 3.71907x6.32=23.50 chs. to witness cor.



23.50 chs. - 2.13 chs. = 21.37 chs. distance across river, which added to 55.12 =

76.49 Set a granite stone, 15x8x6 ins. 10 ins. in the ground for meander cor. of fracl. secs. 25 & 30 mkd. MC on S face with 6 grooves on E & W faces, from which

An aspen, 6 ins. diam. bears N31°30'E 101 lks. dist. mkd. T 1 N R 2 E S 30 MC BT.

A cottonwood, 8 ins. diam. bears N65°30'W 23 lks. dist. mkd. T 1 N R 1 E S 25 MC BT.

Ascend gradually in aspen and cottonwood timber.

80.00 Set an iron post, 3 ft. long, 3 ins. diam. 24 ins. in the ground for cor. of secs. 19, 24, 25 & 30, mkd. on brass cap T 1 N S 24 in NW
R 2 E S 19 in NE
S 30 in SE and
R 1 E S 25 in NW quadrant; from which

An aspen, 6 ins. diam. bears N32°00'E 6 lks. dist. mkd. T 2 N R 2 E S 19 BT.

An aspen, 8 ins. diam. bears S84°00'E 20 lks. dist. mkd. T 1 N R 2 E S 30 BT.

An aspen, 6 ins. diam. bears S47°45'W 18 lks. dist. mkd. T 1 N R 1 E S 25 BT.

An aspen, 6 ins. diam. bears N20°00'W 16 lks. dist. mkd. T 1 N R 1 E S 24 BT.

Land, 15.55 chs. nearly level, 43.08 chs. rolling and broken.

Soil, 19.06 chs. vegetable mould, friable 2 ft. deep. Balance, covered with moss and frozen.

East boundary T. 1 N., R. 1 E.

Chains

Timber, 22.99 chs. heavy spruce, 3.51 chs. aspen and cottonwood, 56.50 chs. dense undergrowth.

May 23, 1911.

North bet. secs. 19 & 24.

Over rolling land ascending gradually in aspen and cottonwood timber through dense undergrowth, willows and fallen trees.

32.78 Top of bench, bears E & W, desc. abruptly.

33.00 Foot of descent, bears E & W. Thence over level land.

35.43 Left bank of Nadina Creek, course W.

35.83 Right bank of Nadina Creek, 40 lks. wide, course West. Nadina Creek is a glacial stream frequently shifting its channel among the gravel and boulders through which it flows. The current is swift and the water muddy and about 2 ft. deep.

38.50 Enter heavy growth of willows, bears NE & SW.

39.87 Ascend abruptly about 15 ft.

40.00 Top of bench, bears NE & SW.

Set an iron ~~post~~, ~~3 ft. long~~, 1 ~~in. in diam.~~ 26 ins. in the groung for ¼ sec. cor. mkd. on brass cap ¼ S 24 on W half and S 19 on E half; from which

An aspen, 8 ins. diam. bears N46°30'E 15 lks. dist. mkd. ¼ S 24 BT.

An aspen, 10 ins. diam. bears N82°00'W 5 lks. dist. mkd. ¼ S 19 BT.

Enter aspen timber with dense undergrowth of willows and scattering spruce timber. Nearly level land.

75.00 Enter heavy spruce timber, bears E & W.

80.00 Set an iron post, 3 ft. long, 3 ins. in diam. 24 ins. in the ground for cor. of secs. 13, 18, 19 & 24, mkd. on brass cap T 1 N S 13 in NW

R 2 E S 18 in NE

S 19 in SE and

R 1 E S 24 in SW quadrant; from which

East boundary T. 1 N., R. 1 E.

Chains

A spruce, 6 ins. diam. bears N15°15'W 41 lks. dist. mkd. T 1 N R 2 E S 18 BT.

A spruce, 6 ins. diam. bears S60°00'E 5 lks. dist. mkd. T 1 N R 2 E S 19 BT.

A spruce, 6 ins. diam. bears S77°00'W 26 lks. dist. mkd. T 1 N R 1 E S 24 BT.

A spruce, 6 ins. diam. bears N88°45'W 46 lks. dist. mkd. T 1 N R 1 E S 13 BT.

Land, nearly level.

Soil, 75 chs. vegetable mould, loose and friable, 5 chs. frozen and covered with moss.

Timber, 75 chs. aspen, 5 chs. spruce about 6 ins. diam.

May 24, 1911.

North bet. secs. 13 & 18.

Over level land through scattering spruce, aspen and cottonwood timber and willows, 16 ft. high.

29.70 Enter heavy spruce timber, bears E & W.

34.55 Creek, 4 lks. wide, course W. Clear, 1 ft. deep with muddy bottom.

40.00 Set an iron post, 3 ft. long, 1 in. in diam. 26 ins. in the ground for ¼ sec. cor. mkd. on brass cap ¼ S 13 on W half and S 18 on E half; from which

A spruce, 8 ins. diam. bears N84°00'E 8½ lks. dist. mkd. ¼ S 18 BT.

A spruce, 8 ins. diam. bears S73°30'W 32 lks. dist. mkd. ¼ S 13 BT.

65.00 A circular pond, 2 acres in area bears West 3 chs. dist.

75.00 Leave heavy spruce timber, bears E & W.

Enter willows, 16 ft. high.

80.00 Set an iron post, 3 ft. long, 3 ins. in diam. 24 ins. in the ground for cor. of secs. 7, 12, 13 & 18, mkd. on brass cap T 1 N S 12 in NW
R 2 E S 7 in NE
S 18 in SE and
R 1 E S 13 in SW quadrant; from which

East boundary T. 1 N., R. 1 E.

Chains

A cottonwood, 10 ins. diam. bears N55°45'E 75 lks. dist mkd. T 1 N R 2 E S 7 BT.

A spruce, 4 ins. diam. bears S16°45'E 23 lks. dist. mkd. T 1 N R 2 E S 18 BT.

A spruce, 4 ins. diam. bears S42°15'W 76 lks. dist. mkd. T 1 N R 1 E S 13 BT.

A spruce, 5 ins. diam. bears N34°00'W 20 lks. dist. mkd. T 1 N R 1 E S 12 BT.

Land, level.

Soil, 29.70 chs. in S ½ loose loam, balance frozen moss.

Timber, 29.70 chs. scattering spruce, cottonwood and aspen

45.00 chs. heavy spruce timber, 6-8 ins. diam.

May 25, 1911.

North bet. secs. 7 & 12.

Over level land through scattering cottonwood timber and willows, 15 ft. high.

10.00 Foot of hill, bears E & W. Ascend.

20.00 Top of hill, 100 ft. high, bears E & W. Thence on bench land through scattering spruce and aspen timber.

40.00 Set an iron post, 3 ft. long, 1 in. in diam. 26 ins. in the ground for ¼ sec. cor. mkd. on brass cap ¼ S 12 in W half and S 7 in E half; from which

A spruce, 8 ins. diam. bears S 0°45'E 173 lks. dist. mkd. ¼ S 7 BT.

A spruce, 8 ins. diam. bears S18°00'W 24 lks. dist. mkd. ¼ S 12 BT.

This cor. sets in the extreme edge of a nearly dry lake bed containing about 20 acres of grass land with about ½ acre of water in the center.

80.00 Set an iron post, 3 ft. long, 3 ins. in diam. 24 ins. in the ground for cor. of secs. 1, 6, 7 & 12, mkd. on brass cap T 1 N in N half

R 2 E S 6 in NE

S 7 in SE

R 1 E S 12 in SW and

East boundary T. 1 N, R. 1 E.

Chains

S 1 in NW quadrant; from which

A spruce, 16 ins. diam. bears N29°30'E 25 lks. dist. mkd. T 1 N R 2 E S 6 BT.

A spruce, 8 ins. diam. bears S57°45'E 23 lks. dist. mkd. T 1 N R 2 E S 7 BT.

A spruce, 5 ins. diam. bears S37°40'W 35 lks. dist. mkd. T 1 N R 1 E S 12 BT.

A spruce, 7 ins. diam. bears N75°00'W 15 lks. dist. mkd. T 1 N R 1 E S 1 BT.

Land, level.

Soil, sandy loam of organic formation, 1½ ft. deep.

Timber, scattering spruce, cottonwood and aspen.

North bet. secs. 1 & 6.

Ascend gradually in spruce and aspen timber.

12.00 Top of ascent bears E & W. Thence level land.

Leave spruce and aspen timber. Enter windfalls and dense undergrowth.

40.00 Set a granite stone, 14x12x6 ins. 9 ins. in the ground for ¼ sec. cor. mkd. ¼ on W face; from which

A spruce, 8 ins. diam. bears N24°11'E 297 lks. dist. mkd. ¼ S 6 BT.

A spruce, 7 ins. diam. bears N36°11'W 361 lks. dist. mkd. ¼ S 1 BT.

May 26, 1911.

41.50 Enter heavy green spruce timber, bears NW & SE.

46.30 Leave heavy green spruce timber, bears NW & SE.

Enter willows.

80.00 Set an iron post, 3 ft. long, 3 ins. in diam. 24 ins. in the ground for cor. of Ts 1 & 2 N Rs 1 & 2 E, mkd. on brass cap T 2 N in N half

R 2 E S 31 in NE
S 6 in SE.
T 1 N in S half

R 1 E S 1 in SW and

S 36 in NW quadrant; from which

A spruce, 6 ins. diam. bears N 6°15'E 41 lks. dist.

East boundary T 1 N, R. 1 E.

Chains

mkd. T 2 N R 2 E S 31 BT.

A spruce, 5 ins. diam. bears S39°00'E 23 lks. dist.

mkd. T 1 N R 2 E S 6 BT.

A spruce, 5 ins. diam. bears S40°00'W 19 lks. dist.

mkd. T 1 N R 1 E S 1 BT.

A spruce, 5 ins. diam. bears N17°00'W 32 lks. dist.

mkd. T 2 N R 1 E S 36 BT.

Land, nearly level.

Soil, sandy loam, 2 ft. deep.

Timber, heavy spruce 16.80 chs.

Dense undergrowth, 68.00 chs.

May 27, 1911.

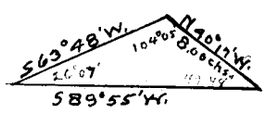
North boundary T 1 N, R 1 E.

Chains

Thence I run

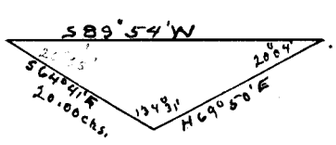
West on a random line, along the N bdy. of T 1 N R 1 E setting temp. ¼ sec. and sec. cors. at intervals of 40.00 and 80.00 chs. tangent method. At 255.44 chs. left bank of Copper River on a bend, course SE. North 19 lks. from tangent to position for temp. meander cor. on gravel bars. To determine the distance across bend I set a flag S89°55'W on tangent line on gravel bar on W side of bend and run a base line N40°17'W 8.00 chs. to a point from which the flag on W side of bend bears S63°48'W which gives for triangulation:-

sin 26°07':sin 104°05'::8.00:dist.



log sin 104° 05'	9.986746
log 8.00	0.903090
sum	10.889836
log sin 26° 07'	9.643650
log. dist.	1.246176 = 17.63 chs.

17.63 chs. added to 255.44 chs. gives 273.07 chs. to flag on gravel bar on W side of bend. Thence chaining on gravel bar to 280.95 chs. North 23 lks. from tangent to position for temp. meander cor. on left bank of river on W side of bend. At 298.50 chs. left bank of Copper River, course SE. North 26 lks. from the tangent to point for temp. meander cor. To determine the distance across river I set a flag S89°54'W on tangent line on right bank of river and leave a flag at point on tangent line on left bank of river. I then cross river and from the flag on right bank run a base line S64°41'E 20.00 chs. to a point from which the flag on tangent on left bank of river bears N69°50'E which gives for triangulation:-



sin 20°04':sin 134°31'::20.00:dist.

log sin 134° 31'	9.853118
log 20.00	1.301030
sum	11.154148
log sin 20° 04'	9.535438
log dist.	1.618710 = 41.56 chs. dst. across River

~~41.56 chs.~~ 41.11 added to 298.50 chs. gives 340.06 chs. to flag on right bank of river. North 34 lks. from tangent to point for temp. meander cor. At 479.30 chs. North

North boundary T. 1 N., R. 1 E.

Chains

68 lks. to parallel. Intersect Principal Meridian 42 lks. South of the cor. of Ts. 1 & 2 N Rs. 1 E & 1 W, which is a granite stone, 10x6 ins. 6 ins. above ground firmly set and marked and witnessed as described by the surveyor general.

The falling answers to a correction of 0°03' or 7 lks. N per mile, counting from the NE cor. of the township.

Therefore I run

S89°57'E bet. secs. 6 & 31.

Over level land in burned timber and dense undergrowth.

26.10 Enter green spruce timber, bears N & S.

39.30 Set an iron post, 3 ft. long, 1 in. in diam. 26 ins. in the ground for ¼ sec. cor. mkd. on brass cap, ¼ S 31 in N half and S 6 in S half; from which

A spruce, 6 ins. diam. bears N34°28'E 22 lks. dist. mkd. ¼ S 31 BT.

A spruce, 6 ins. diam. bears S 5°00'W 29 lks. dist. mkd. ¼ S 6 BT.

62.70 Leave green spruce and enter burned timber, bears N & S.

67.30 Leave burned timber and enter green timber, bears N & S.

70.00 Leave green spruce and enter burned timber, bears N & S.

72.70 Leave burned timber and enter green spruce, bears N & S.

79.30 Set an iron post, 3 ft. long, 3 ins. in diam. 24 ins. in the ground for Cor. of secs. 5, 6, 31 & 32, mkd. on brass cap T 2 N S 32 in NE
R 1 E S 5 in SE
T 1 N S 6 in SW and
R 1 E S 31 in NW quadrant; from which

A spruce, 8 ins. diam. bears N13°18'E 44 lks. dist. mkd. T 2 N R 1 E S 32 BT.

A spruce, 9 ins. diam. bears S.61°10'E 20 lks. dist. mkd. T 1 N R 1 E S 6 BT.

A spruce, 10 ins. diam. bears S68°32'W 74 lks. dist. mkd. T 1 N R 1 E S 5 BT.

A spruce, 8 ins. diam. bears N50°50'W 48 lks. dist. mkd. T 2 N R 1 E S 31 BT.

North boundary T. 1 N., R. 1 E.

Chains

Land, nearly level with slight drain to Eastward.

Soil, vegetable mould, frozen in the green timber.

Timber, 79.30 chs. partly burned but still standing.

S89°57'E bet. secs. 5 & 32.

Descending slightly in burned spruce timber through dense undergrowth.

8.60 Government wagon road from Valdez to Fairbanks, bears N28°W and S28°E.

15.80 Leave burned timber and enter green spruce, bears NW & SE.

35.00 Descend abruptly over East slope.

40.00 Set an iron post, 3 ft. long, 1 in. on diam. 26 ins. in the ground, for ¼ sec. cor. mkd. on brass cap ¼ S 32 in N half and S 5 in S half; from which

A spruce, 6 ins. diam. bears N 9°50'E 45 lks. dist. mkd. ¼ S 32 BT.

A spruce, 8 ins. diam. bears S65°45'E 17 lks. dist. mkd. ¼ S 5 BT.

42.04 Indian trail, bears N10°E & S10°W.

42.30 Descend abruptly from bench land on NE slope of river bluff.

42.90 Creek, 10 lks. wide, course N. Water, clear, 6 ins. deep, stony bottom.

58.32 Falls on a granite stone in place, 3 ft. square, 1 ft. above ground. I cut a cross (+) at the exact point for witness cor. to meander cor. of fracl. secs. 5 & 32, mkd. with 6 grooves on N & S faces and WC MC on E face of stone; from which

A spruce, 6 ins. diam. bears N33°35'E 68 lks. dist. mkd. T 2 N R 1 E S 32 WC MC BT.

A spruce, 6 ins. diam. bears S75°35'E 152 lks. dist. mkd. T 1 N R 1 E S 5 WC MC BT.

59.94 Right bank of Copper River, course SE. Impracticable to establish meander cor. of fracl. secs. 5 & 32 on account of liability of destruction by ice and drift-wood.

North boundary T.1 N.,R.1 E.

Chains.

80.00 Point for Cor. of secs. 4, 5, 31 & 32 falls in Copper River

Land, rolling and broken.

Soil, vegetable mould, 1 ft. deep.

Timber, spruce 59.94 chs.

S89°57'E bet. secs. 4 & 33.

In Copper River.

21.50 Left bank of Copper River, banks 6 ft. high.

Set a granite stone, 14x8x6 ins. 9 ins. in the ground, for meander cor. of fracl. secs. 4 & 33, mkd. MC on W face with 6 grooves on N & S faces; from which

A cottonwood, 6 ins. diam. bears N29°15'E 29 lks. dist. mkd. T 2 N R 1 E S 33 MC BT.

A birch, 6 ins. diam. bears S67°15'E 13 lks. dist. mkd. T 1 N R 1 E S 4 MC BT.

Thence over level land through cottonwood timber and dense undergrowth.

39.05 Left bank of Copper River, course NE , banks 4 ft. high.

Set a granite stone, 18x12x6 ins. 12 ins. in the ground for meander cor. of fracl. secs. 4 & 33, mkd. MC on E face, with 6 grooves on N & S faces; from which

A cottonwood, 6 ins. diam. bears S83°15'W 47 lks. dist. mkd. T 1 N R 1 E S 4 MC BT.

A cottonwood, 6 ins. diam. bears N85°00'W 30 lks. dist. mkd. T 2 N R 1 E S 33 MC BT.

Leave timber and undergrowth, bears NE & SW . Over river bar.

40.00 Point for ¼ sec. cor. falls in Copper River bed. Unsafe.

46.93 Edge of water in Copper River, too deep to chain across.

64.56 Left bank of Copper River, course SE , banks 6 ft. high.

Set a granite stone, 18x12x6 ins. 12 ins. in the ground for meander cor. of fracl. secs. 4 & 33, mkd. MC on W face, with 6 grooves on N & S faces; from which

A spruce, 6 ins. diam. bears S59°30'E 91 lks. dist. mkd. T 1 N R 1 E S 4 MC BT.

A spruce, 4 ins. diam. bears N77°00'W 9 lks. dist.

North boundary T.1 N.,R.1 E.

Chains.

mkd. T 2 N R 1 E S 33 MC BT.

Enter spruce and cottonwood timber with dense undergrowth of alder and willows.

64.80 Indian trail, bears NW & SE.

73.50 Indian house bears South 2 chs. dist.

80.00 Set an iron post, 3 ft. long, 3 ins. in diam. 24 ins. in the ground, for cor. of secs. 3, 4, 33 & 34, mkd. on brass cap T 2 N S 34 in NE
R 1 E S 3 in SE
T 1 N S 4 in SW and
R 1 E S 33 in NW quadrant; from which

A spruce, 6 ins. diam. bears N35°00'E 36 lks. dist. mkd. T 2 N R 1 E S 34 BT.

A spruce, 8 ins. diam. bears S67°00'E 63 lks. dist. mkd. T 1 N R 1 E S 3 BT.

A spruce, 9 ins. diam. bears S82°00'W 2 lks. dist. mkd. T 1 N R 1 E S 4 BT.

A spruce, 9 ins. diam. bears N 7°00'W 27 lks. dist. mkd. T 2 N R 1 E S 33 BT.

Land, level.

Soil, 32.99 chs. river bottom, alluvial deposits.

Timber, 32.99 chs. spruce and cottonwood with dense undergrowth.

S 89°57' E bet. secs. 3 & 34.

Over level land through heavy spruce and cottonwood timber with dense undergrowth.

4.75 Creek, 5 lks. wide, course S. Pure water, 8 ins. deep, rocky bottom. Stream glacial in origin.

Ascend over SW slope.

15.00 Top of bench, bears NW & SE. 100 ft. above cor.

Thence over level land.

27.12 Descend abruptly over E slope of ravine, bears N & S.

27.50 Creek, 3 lks. wide, course S. Pure water, 8 ins. deep, gravel bottom.

North boundary T 1 N, R. 1 E.

Chains.

Ascend.

30.53 Top of bench, bears N & S. Thence over level land through scattering spruce and heavy cottonwood timber.

40.00 Set an iron post, 3 ft. long, 1 in. in diam. 26 ins. in the ground, for ¼ sec. cor. mkd. on brass cap, ¼ S 34 in N half and S 3 in S half; from which

A cottonwood, 8 ins. diam. bears N39°15'E 19 lks. dist. mkd. ¼ S 34 BT.

A cottonwood, 8 ins. diam. bears S66°15'E 16 lks. dist. mkd. ¼ S 3 BT.

56.00 Foot of terrace, bears N & S. Ascend.

59.10 Top of terrace, bears N & S. 100 ft. above ¼ sec. cor. Thence over level land.

80.00 Set an iron post, 3 ft. long, 3 ins. in diam. 24 ins. in the ground, for cor. of secs. 2, 3, 34 & 35, mkd. on brass cap T 2 N S 35 in NE
R 1 E S 2 in SE
T 1 N S 3 in SW and
R 1 E S 34 in NW quadrant; from which

A spruce, 9 ins. diam. bears N57°00'E 85 lks. dist. mkd. T 2 N R 1 E S 35 BT.

An aspen, 6 ins. diam. bears S71°00'E 21 lks. dist. mkd. T 1 N R 1 E S 2 BT.

An aspen, 8 ins. diam. bears S47°00'W 34 lks. dist. mkd. T 1 N R 1 E S 3 BT.

An aspen, 8 ins. diam. bears N28°00'W 71 lks. dist. mkd. T 2 N R 1 E S 34 BT.

Land, level and rolling. Terraces rising from river.

Soil, alluvial river bottom not subject to overflow. On the terraces or bench land the soil is of organic formation and about 1 ft. deep.

Timber, spruce and cottonwood with dense undergrowth, 80.00 chs. This timber is not merchantable.

North boundary T.1 N., R.1 E.

Chains.

S89°57'E bet. secs. 2 & 35.

Over nearly level land through spruce, cottonwood and aspen timber and dense undergrowth.

40.00 Set an iron post, 3 ft. long, 1 in. in diam. 26 ins. in the ground for ¼ sec. cor. mkd. on brass cap ¼ S 35 in N half and S2 in S half; from which

A cottonwood, 8 in. diam. bears N14°30'E 65 lks. dist. mkd. ¼ S 35 BT.

A cottonwood, 5 in. diam. bears S 7°30'W 67 lks. dist. mkd. ¼ S 2 BT.

58.00 A circular pond, containing about 6 acres bears South 4 chs. dist.

61.50 Leave green timber and enter dead timber, bears N & S.

80.00 Set an iron post, 3 ft. long, 3 ins. in diam. 24 ins. in the ground, for cor. of secs. 1, 2, 35 & 36, mkd. on brass cap T 2 N S 36 in NE
R 1 E S 1 in SE
T 1 N S 2 in SW and
R 1 E S 35 in NW quadrant; dig pits, 18x18x12 ins. in each sec. 5½ ft. dist. and raise a mound of earth, 4 ft. base, 2 ft. high W of cor.

Land, level.

Soil, vegetable loam about 1 ft. deep.

Timber, spruce, aspen and cottonwood, 80.00 chs.

S89°57'E bet. secs. 1 & 36.

Over level land through dead standing timber and dense undergrowth.

40.00 Set a sandstone, 12x8x6 ins. 8 ins. in the ground for ¼ sec. cor. mkd. ¼ on N face; from which

An aspen, 4 ins. diam. bears N42°55'E 114 lks. dist. mkd. ¼ S 36 BT.

An aspen, 4 ins. diam. bears S86°30'W 394 lks. dist. mkd. ¼ S 1 BT.

23.50 Enter green spruce timber, bears NW & SE.

North boundary T. 1 N., R. 1 E.

Chains.

46.00 Low ridge, bears NW & SE. Descend gradually.

47.50 Leave green timber, bears N & S. Thence through dense undergrowth.

75.00 Enter scattering spruce and dense undergrowth, bears N. & S.

80.00 The cor. of Ts. 1 & 2 N Rs. 1 & 2 E.

Land, level and rolling.

Soil, vegetable mould, 1 ft. deep.

Timber, spruce 24.00 chs.

Dense undergrowth, 80.00 chs.

June 3, 1911.

Latitudes, departures and closing errors.

Line desig.	Bearing	Dist.	Latitudes N	Latitudes S	Departures E	Departures W
Base Line	West	480.00				480.00
Prin. Mer.	North	480.00	480.00			
N bdy. ~~T1N R1E~~	S89°57'E	479.30		.42	479.30	
E bdy. ~~T1N R1E~~	South	480.00		480.00		
Convergency					1.36	
Totals			480.00	480.42	480.66	480.00
				480.00	480.00	
Errors			in Lat	.42	.66	in Dep

General Description.

This township is level throughout, except the bluffs caused by Copper River which are about 300 ft. high. The township is covered with spruce timber with some cottonwood and aspen in the part on the E side of Copper River. The land in the timbered portion is covered with moss which never thaws out.

Copper River is of glacial origin and muddy in the summer months.

The land along the river flats is alluvial while that on the benches is glacial deposit with about 1 ft. of vegetable mould on top.

J. Frank Wanner,

U. S. Surveyor.

Final Oaths of U.S. Surveyor and Assistants.

LIST OF NAMES

A list of the names of the individuals employed by J. Frank Warner, U.S. Surveyor, to assist in running, measuring and marking the lines and corners described in the foregoing field notes of the survey: East and North bdrs. of T. 1 N., R. 1 E.; the South bdy. of T. 2 N., R. 1 W. and T. 4 N., R. 1 W.; U.S. Military Reservation, Agricultural Sta. and School Reserves of the Copper River Base and Meridian in the District of Alaska, showing the respective capacities in which they acted.

F. R. Easterday,	Chainman,
W. E. Wood,	Chainman,
Alfred Rasmussen,	Moundman,
W. F. O'Neil,	Flagman,
G. C. Haneman,	Axman,
Peter Henry,	Axman.

FINAL OATHS OF ASSISTANTS

I hereby certify that I assisted J. Frank Warner, U.S. Surveyor, in surveying all those parts or portions of the exterior boundaries of T. 1 N., R. 1 E. and the South bdy. of T. 2 N., R. 1 W., U.S. Military Reservation, Agricultural Sta. Res., of the Copper River Base and Meridian in the District of Alaska 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 my knowledge and belief, well and faithfully surveyed, and the corner monuments established according to the instructions furnished by the Commissioner of the General Land Office.

W. F. O'NEILL

Subscrubed and sworn to before me this seventh day of August, 1911.

J. FRANK WARNER,

U.S. Surveyor.

We hereby certify that we assisted J. Frank Warner, U.S. Surveyor, in surveying all those parts or portions of the exterior boundaries of T. 1 N., R. 1 E., South boundary of T. 2 N., R. 1 W. and West bdy. of T. 4 N., R. 1 W., U.S. Military, Agricultural Sta. and School Reserves of the Copper River Base and Meridian, in the District of Alaska, 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 Commissioner of the General Land Office.

F. R. Easterday,	Chainman,
W. E. Wood,	Chainman,
Alfred Rasmussen,	Flagman and Moundman,
G. C. Haneman,	Axman,
Peter Henry,	Axman.

Subscribed and sworn to before me this twenty-first day of August, 1911.

J. FRANK WARNER,
U.S. Surveyor.

CERTIFICATE OF ASSISTANTS.

We, the undersigned, hereby certify upon honor that we assisted, to the best of our skill and ability, J. Frank Warner, U. S. Surveyor, during the periods and in the capacities stated opposite our several signatures, in surveying all those parts or portions of the exterior boundaries of T. 1 N., R. 1 E.; the south boundary of T. 2 N., R. 1 W.; the West boundary of T. 4 N., R. 1 W.; the U.S. Military Reserve, U.S. Agricultural Reserve and School Reserve of the Copper River Base and Meridian, in the District of Alaska

of the Meridian, in the State of

which are represented in the foregoing field notes as having been executed 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 executed.

NAME.	PERIOD OF SERVICE.		CAPACITY.
	BEGUN.	ENDED.	
F. R. Easterday,	May 20, 1911	August 21,1911	Chainman,
W. E. Wood,	May 20, 1911	August 21,1911	Chainman,
Alfred Rasmussen,	May 20, 1911	August 21,1911	Flagman and Moundman,
G. C. Haneman,	May 20, 1911	August 21, 1911	Axman,
Peter Henry,	May 20, 1911	August 21,1911	Axman,
W. F. O'Neill	May 20, 1911	August 7,1911	Flagman.

Subscribed and certified to before me on the dates of the final service as shown above.

6—2764

U. S. Surveyor.

FINAL OATH OF UNITED STATES SURVEYOR.

I, J. Frank Warner, U. S. Surveyor, do solemnly swear that, in pursuance of special instructions received from the ~~U. S. Surveyor General for~~ Commissioner of the General Land Office bearing date of the eighteenth day of April, 1911, I have well, faithfully, and truly, in my own proper person, and in strict conformity with said instructions, the Manual of Surveying Instructions, and the laws of the United States, surveyed all those parts or portions of the Exterior boundaries of Township One North, Range One East; South boundary of Township Two North, Range One West; West boundary of Township Four North, Range One West; U.S. Military Reserve, U.S. Agricultural Station and School Reserve of the Copper River Base and Meridian, in the ~~State of~~ Territory of Alaska, which are represented in the foregoing field notes as having been executed 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 ~~U. S. Surveyor General for~~ Commissioner of the General Land Office and in the specific manner described in the field notes, and that the foregoing are the original field notes of such survey.

J. Frank Warner,
U. S. Surveyor.

Subscribed by said J. Frank Warner, and sworn to before me this ~~twenty-fifth~~ day of March, 1912.

SEAL

Wm. L. Distin,
U.S. Surveyor General.

APPROVAL.

OFFICE OF THE UNITED STATES SURVEYOR GENERAL,

JUNEAU, ALASKA, March 19", 1914.

The foregoing field notes of the survey of the East and North Boundaries of Township No. 1 North, Range No. 1 East, of the Copper River Base and Meridian, in the Territory of Alaska

executed by J. Frank Warner, United States Surveyor, under his special instructions dated April 18, 1911, having been critically examined, and the necessary corrections and explanations made, the said field notes, and the surveys they describe, are hereby approved.

Charles E. Davidson
U. S. 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.~~

ETL 6—2764

~~U. S. Surveyor General.~~

4—679.

RECEIVED
S. G. O.
NOV 20 1905
ANSWERED

392

FIELD NOTES

OF THE SURVEY OF THE

Principal Meridian

through

Townships Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, and 12 North

between

Ranges, No. 1 East and No. 1 West

of the

Copper River Base and Meridian

in the

District of Alaska

RECEIVED
S. G. O.
JUN 19 1906
ANSWERED

Of the ..... *Meridian,*

AS SURVEYED BY

Alfred B. Lewis, *United States Deputy Surveyor,*

Under his Contract No. 3, *dated* March 21, 1904, *189*

Survey commenced April 17, 1905, *189*

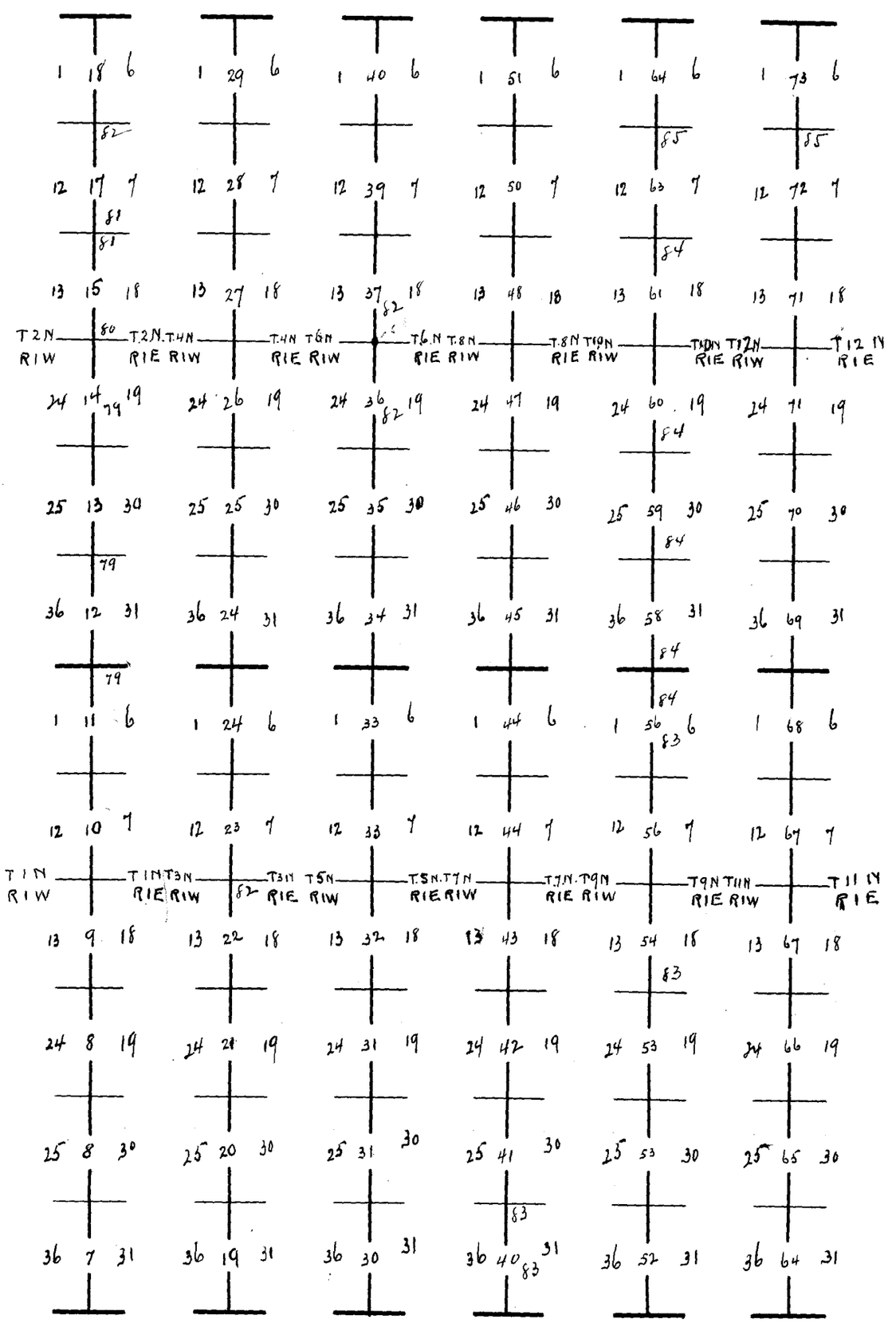
Survey completed June 9, 1905, *189*

6—151

NAMES AND DUTIES OF ASSISTANTS.

F C Bunce	Chainman
Paul Drake	Chainman
J C Drake	Chainman
Dan W Sheehan	Chainman
S C Lewis	Rodman
W H Johnston	Axman
Dan W Sheehan	Axman
F C Bunce	Flagman

INDEX DIAGRAM.



PRELIMINARY OATHS OF ASSISTANTS.

WE, F. C. Bunce, John C. Drake and Paul Drake and Dan Sheehan do solemnly swear that we will well and faithfully execute the duties of chainmen; that we will level the chain over 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 Principal Meridian, through Townships Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 & 12 North, between Ranges 1 E and 1 W, of the Copper River Base and Meridian, in the District of Alaska.

F. C. Bunce, Chainman.

Paul Drake, Chainman.

Subscribed and sworn to before me this 1st day of April, 1895

J. C. Drake
Dan O'Sheehan
Andrew Holman
U.S. Commissioner

SEAL

WE, S. C. Lewis 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 Principal Meridian, through Townships Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 and 12, North, between Ranges 1 E and 1 W, of the Copper River Base and Meridian, in the District of Alaska.

S. C. Lewis, Moundman.

, Moundman.

Subscribed and sworn to before me this 1st day of April, 1895

Andrew Holman
U.S. Commissioner

SEAL

WE, W. H. Johnston and Dan Sheehan, 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 Principal Meridian, through Townships Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 and 12, North, between Ranges 1 E and 1 W, of the Copper River Base and Meridian in the District of Alaska

W. H. Johnston, Axman.

Dan O'Sheehan, Axman.

Subscribed and sworn to before me this 1st day of April, 1895

Andrew Holman
U.S. Commissioner

SEAL

I, F. C. Bunce, 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 Principal Meridian, through Townships Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 & 12, North between Ranges 1 E. & 1 W. of the Copper River Base and Meridian in the District of Alaska

F. C. Bunce, Flagman.

Subscribed and sworn to before me this 1st day of April, 1895

Andrew Holman
U.S. Commissioner

SEAL

My astronomical station for determining the latitude and longitude of the initial point of the Copper River base and prindipal meridian is located 6 feet East of the U. S. Telegraph Station at Copper Center and South 80° E. 17.10 chs. dist from the 1/4 sec. cor. bet. secs. 13 and 18 T 2 N R 1 E and R 1 W or 9.46 miles North and 0.216 miles East of the initial point. I determine my astronomical position as follows:

Aug 26, 1905. My observations were made with an A. Leitz Compound Mining and Solar Transit, the main telescope being provided with a vertical sighting eye piece and a Saegmuller solar attachment. The horizontal and vertical circles read direct to single minutes. The instrument was examined and certificate filed in the office of the Surveyor General for Alaska prior to the begining of this survey. I test all the adjustments of the instrument.

At 9 h p.m. l.m.t. I begin to observe Polaris at Eastern elongation; I follow the star until it reaches its most Easterly position then mark the line thus determined upon a hub firmly set in the ground 3 chains North of my station. I immediately turn the vernier plate 180° in aximuth which reverses the telescope and observe Polaris as above described and mark the line upon the hub 3 chs. North of my station; I find the two lines coincide.

August 26, 1905.

August 27, 1905.

At 11h 45m a.m. l.m.t. I begin to observe the lower limb of the sun for determining the latitude. When it reaches its highest point the altitude is 37° 53' 40" I then reverse the telescope which has a reversion lever and find the altitude to agree with the one previously determined; then 37°53'40" + 15' 52" for semi-dia. - 01' 15" for refraction gives 38° 08' 17" the true altitude of the sun's center; then 90° - 38° 08' 17" = 51° 51' 43", co-alt. + 10° 04' 43", the decl. = 61° 56' 26", the lat. of the astronomical station at Copper Center.

/

I then lay off the azimuth of Polaris 2° 33.1 to the West and mark the meridian by a small copper nail in a hub firmly set in the ground 3 chs. North of my station.

At 9h p.m. l.m.t. I begin to observe Polaris again in the manner described last night and find the resulting meridian coincides with the one already established.

August 29, 1905: I turn 2° 33.1' from the point in line with Polaris and check the meridian I established May 27.

At 11h 45m a.m. l.m.t. with my transit in the meridian above described I begin to observe the sun and note the time as each limb crosses the meridian.

The first limb crosses at 11h 54m 16 s

The second limb crosses at 11h 56m 27s, the mean of which is 11h 55m 21.5s, the apparent time of meridian crossing. I add 51.5s, the equation of time on this date which gives 11h 56m 13s mean time. I observe the upper limb of the sun and find the altitude to be 37° 43' 00" which corrected for semi-dia. and refraction gives a lat. of 61° 56' 25".

Mr. J. E. McGrath, Assistant Astronomer, in the Coast & Geodetic Survey, being stationed at Valdez, at this time and having a chronometer which he is using in determing the exact longitude of the Valdez observatory, consented to exchange time signals with me and give me the reading of his chromometer corrected to Greenwich local mean time; therefore

At 8h p.m. l.m.t. by my watch I begin sending 20 signals 10 seconds apart which were received by his chronograph. I then receive 20 signals the time of which I observe on my watch.

At 8h 14m p.m. by my watch I sent 20 more signals to the Valdez observatory.

August 29, 1905.

August 30: I observed the transit of each limb of the sun across the meridian which I established heretofore; the first limb crosses at 11h 53m 54s, the second limb crosses at 11h 56m 05s, the mean of

which is 11h 54m 59.5s. I add 33.6 seconds the equation of time on this date which gives 11h 55m 33.1s mean time; therefore my watch rate is 40 seconds slow in 24 hours, or 1.66" per hour which multiplied by 8 hours, the time from noon on August 29 until the time of sending signals is 13.28 seconds which added to 11h 56m 13s gives 11h 56m 26.28s. The difference in time between chronometer corrected to Greenwich meridian and my mean solar time, that is my watch time + 3m 33.7s is 9h 41m 29.7 s = 145° 22' 25.5s West of Greenwich.

As the initial point is 16.85 chains or 23.3 seconds in longitude West of my astronomical station then the longitude of the initial point is 145° 22' 48.8",

The mean of the two observations for latitude at my astronomical station is 61° 56' 25.5" . The initial point is 9.46 miles South of my astronomical station or .866 X 9.46= 8.19' or 8' 12", which gives the latitude of the initial point 61° 48' 13.5". The latitude of the initial point as determined by observation on Polaris at upper culmination on April 17, 1905 at my camp 2 miles 53 chains North of the initial point is 61° 50.5' which corrected for the initial point gives 61° 48' 12".

From the means of the above observations the longitude of the initial point is 145° 22' 48.8", The latitude of the initial point is 61° 48' 13.5".

[illegible]

See page [illegible] for [illegible] 31, 1911

Alfred D. Lewis,

U. S. Deputy Surveyor.

¼ Corner Sec. 13 & 18 T. 2N R. 1E - C V.C.S. in 1911
Lat 61° 57' 24.830" N
Long 145° 18' 41.954"
C. R. 13. Lat 61° 49' 10.963"

Chains Survey commenced April 17, 1905, and executed with an A. Leitz Compound Mining and solar transit The horizontal limb is provided with two double verniers reading to single minutes of arc, which is also the least count of the latitude and declination arc.

The instrument was examined and found to be in correct adjustment prior to the begining of this survey, and certificate filed in the office of the Surveyor General for Alaska.

I establish the initial point on the north side of Stuck Mountain near its base.

As there is no solid ledge of rock to be found I select a lavastone 28 ins. long, 23 ins. wide, which is firmly imbeded in the ground and is 18 ins. or more thick, with the top surface 6 ins. above ground, and suitably located to set the transit over. I drill a hole 2 ins. deep in centre of rock and drive into the hole a copper plug 2 1/2 ins. long, 1/2 ins. diam. for the initial point. I mark on the upper surface of the rock the words "Initial Point" on the South; T.1 N. on the North; R. 1 W. on the West and R. 1 E. on the East. from which,

A spruce 6 ins. diam. bears N. 43° 10' W. 22 lks. dist. marked T 1 N R 1 W S 36 B T .

A spruce 6 ins. diam. bears N. 54° E. 17 lks. dist. marked T 1 N R 1 E S 31 B T .

A spruce 6 ins. diam. bears S. 59° 30' W. 23 lks. dist. marked T 1 S R 1 W S 1 B T .

A spruce 6 ins. diam. bears S. 76° 45' E. 30 lks. dist. marked T 1 S R 1 E S 6 B T .

The most Northwestern peak of Stuck Mtn. bears S. 43° W.

Mt. Drum bears N. 43° E.

Roundtop Mtn. bears N. 0° 10' W.

At my camp which is two miles 53 chains North of the initial point at about 11 h. 30 m. p.m. l.m.t. I begin to observe the eastern progress

400 Principal Meridian through T. 1 N. between Rs. 1 E. and 1 W.

Chains of Polaris in accordance with instructions on page 96 of the manual. When Polaris and Delta are in the same vertical plane, I note the time by my watch and continue to follow Polaris for 5 minutes when it is upon the meridian. I mark the true meridian thus found by a cross on a stone firmly set in the ground 3 chs. North of the transit.

The apparent altitude of Polaris at lower culmination is 60° 39',less 31 seconds for refraction gives the true altitude 60° 38' 29" which added to the co-declination of Polaris gives the true latitude 61° 50.5' .

April 17, 1905.

April 18: I examine the adjustments of the transit, 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 my camp above described my latitude is 61° 50.5' N. longitude 145° 22' 25.5" W.

I set off 61° 50' N. on the lat. arc., 10° 49' N. on the decl. arc: and at 9h a.m. l.m.t. determine with the solar a meridian; which coincides with the true meridian established last night.

At 3h p.m. l.m.t. I set off 61° 50' N. on the lat. arc. 10° 54' N. on the decl. arc. and determine the meridian which also coincides with the true meridian established last night, therefore, I conclude the adjustments of the solar are satisfactory. The magnetic bearing of the true meridian is N. 30° 15' W. the angle thus determined gives the mag. decl. 30° 15' E.

I defer the determination of the longitude of the initial point to a more favorable season and a full report of the observations will append the returns of this survey.

April 18, 1905.

Chains April 19, 1905. I commence at the initial point previously described. At 8h a.m. l.m.t. I set off 60° 48' N. on the lat. arc. 11° 09' N. on the decl. arc. and determine the meridian with the solar.

Thence I run North between secs. 31 and 36,

Descending through spruce timber and scattering brush.

20.00 Foot of mountain bears N. 80° W. and S. 80° E. desc. more gradually.

No difference in measurement between the two sets of chainmen.

40.00 Set a lavastone 14 X 8 X 8 ins. 9 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face from which,

A spruce 7 ins. diam. bears S. 30° E. 17 lks. dist. marked 1/4 S. 31 B T .

A spruce 7 ins. diam. bears N. 64° 05' W. 52 lks. dist. marked 1/4 S 36 B T .

No difference in measurement between the two sets of chainmen.

80.00 Set a sandstone 16 X 7 X 6 ins. 12 ins. in the ground for cor. of secs. 25, 30, 31 and 36, marked with one notch on S. and five notches on N. edge, from which,

A spruce 6 ins. diam. bears N. 28° 50' E. 23 lks. dist. marked T 1 N R 1 E S 30 B T .

A spruce 6 ins. diam. bears N. 50° W. 30 lks. dist. marked T 1 N R 1 W S 25 B T .

A spruce 10 ins. diam. bears S. 58° W. 34 lks. dist. marked T 1 N R 1 W S 36 B T .

A spruce 5 ins. diam. bears S. 64° 45' E. 18 lks. dist. marked T 1 N R 1 E S 31 B T .

Land mountainous and level .

Soil clay and stony, 1st and 4th rate.

Timber, spruce. Ground covered with 6 ins. to 1 ft. of moss.

Mountainous or timber land on 80 chains.

April 19: At 12 h. l.m.t. I set off 11° 12' N. on the decl. arc. and observe the sun on a meridian; the resulting latitude is 61° 49' N.

Chains North between secs. 25 and 30.

Over level land through spruce timber.

No difference in measurement between the two sets of chainmen.

40.00 Set a sandstone 12 X 9 X 6 ins. 9 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face from which,

A spruce 10 ins. diam. bears S. 65° 27' W. 274 lks. dist. marked 1/4 S 25 B T .

A spruce 6 ins. diam. bears S. 3° 45' E. 393 lks. dist. marked 1/4 S 30 B T .

No difference in measurement between the two sets of chainmen.

80.00 Set a slatestone 12 X 10 X 6 ins. 9 ins. in the ground for cor. of secs. 19, 24, 25 and 30, marked with two notches on the S. and four notches on the N. edges, from which,

A spruce 10 ins. diam. bears N. 14° 05' E. 23 lks. dist. marked T 1 N R 1 E S 19 B T .

A spruce 10 ins. diam. bears N. 85° 47' W. 47 lks. dist. marked T 1 N R 1 W S 24 B T .

A spruce 5 ins. diam. bears S. 49° 05' W. 35 lks. dist. marked T 1 N R 1 W S 25 B T .

A spruce 7 ins. diam. bears S 45° 20' E. 20 lks. dist. marked T 1 N R 1 E S 30 B T .

Land level.

Soil clay and stony 1st and 4th rate.

Scattering timber on 80 chs.

North between sec. 19 and 24.

Over level land through scattering spruce and aspen.

No difference in measurement between the two sets of chainmen.

40.00 Set a sandstone 14 X 9 X 5 ins. 10 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face from which,

A spruce 6 ins. diam. bears N. 6° W. 241 lks. dist. marked 1/4 S 24 B T .

A spruce 8 ins. diam. bears N. 81° 50' E. 264 lks. dist. marked 1/4 S 19 B T .

Chains

45.00 South edge of wet meadow , bears E. and W.

51.00 North edge of meadow, bears E. and W. asc. grad.

53.00 Deserted mail cabins, one on E. and one on W. of line. No trail to be found.

No difference in measurement between the two sets of chainmen.

80.00 Set a slatestone 12 X 8 X 6 ins. 9 ins. in the ground for cor. of secs. 13, 18, 19 and 24, marked with three notches on N. and S. edges, from which,

A spruce 6 ins. diam. bears N. 35° 20' E. 19 lks. dist. marked T 1 N R 1 E S 18 B T .

A spruce 8 ins. diam. bears N. 73° 35' W. 12 lks. dist. marked T 1 N R 1 W S 13 B T .

A spruce 10 ins. diam. bears S. 38° 15' E. 19 lks. dist. marked T 1 N R 1 E S 19 B T .

A spruce 6 ins. diam. bears S 26° 35' W. 40 lks. dist. marked T 1 N R 1 W S 24 B T .

Land nearly level.

Soil 1st rate. Timber on 74 chs.

April 19, 1905.

April 20, 1905 (omit)

North between secs. 13 and 18.

Over level land through thick spruce timber.

No difference in measurement between the two sets of chainmen.

40.00 Set a slatestone 13 X 8 X 6 ins. 9 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face, from which,

A spruce 16 ins. diam. bears S. 45° E. 14 lks. dist. marked 1/4 S 18 B T .

A spruce 8 ins. diam. bears S. 8° W. 10 lks. dist. marked 1/4 S 13 B T .

No difference in measurement between the two sets of chainmen.

80.00 Set a Slatestone 13 X 7 X 6 ins. 9 ins. in the ground for cor. of secs. 7, 12, 13 and 18, marked with four notches on S. and two notches on N. edges. from which,

Chains A spruce 6 ins. diam. bears N. 8° 20' W. 46 lks. dist. marked T 1 N R 1 W S 12 B T .

A spruce 8 ins. diam. bears N. 14° 30' E. 52 lks. dist. marked T 1 N R 1 E S 7 B T .

A spruce 4 ins. diam. bears S. 77° 35' E. 13 lks. dist. marked T 1 N R 1 E S 18 B T .

A spruce 4 ins. diam. bears S. 30° 30' W. 22 lks. dist. marked T 1 N R 1 W S 13 B T .

Land level.

Soil 1st rate. Spruce timber on 80 chs.

April 20: At this corner I set off 11° 32' N. on the decl. arc. and at 12 h l.m.t. observed the sun on the meridian, the resulting latitude is 61° 51' N.

North between secs. 7 and 12.

Over level land through spruce timber and undergrowth.

No difference in measurement between the two sets of chainmen.

40.00 Set a slatestone 12 X 12 X 6 ins. 9 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face, from which,

A spruce 7 ins. diam. bears N. 79° W. 38 lks. dist. marked 1/4 S 12 B T .

A spruce 7 ins. diam. bears East 32 lks. dist. marked 1/4 S 7 B T .

78.00 The corner of secs. 1,6,7,and 12 falls in the edge of a pond therefore

Set a slatestone 12 X 8 X 7 ins. 9 ins. in the ground for W. C. to cor. of secs. 1, 6, 7, and 12 marked W. C. on northeast face with five notches on S. and one notch on N. edges, from which,

A spruce 10 ins. diam. bears N. 77° 15' E. 108 lks. dist. marked W. C. T 1 N R 1 E S 6 B T .

A spruce 8 ins. diam. bears N. 34° 40' W. 78 lks. dist. marked W. C. T 1 N R 1 W S 1 B T .

A spruce 7 ins. diam. bears S. 43° E. 135 lks. dist. marked W C T 1 N R 1 E S 7 B T .

A spruce 4 ins. diam. bears S. 29° W. 47 lks. dist. marked W C T 1 N R 1 W S 12 B T .

Chains

79.00 East edge of lake , bears N. 45° W. S. 45° E.

No difference in measurement between the two sets of chainmen.

80.00 Corner falls in edge of lake.

Land level.

Soil 1st rate. Spruce timber on 78 chs.

April 20: At 4h. p. m. l.m.t. I set of 61° 52' N. on the lat. arc. 11° 37' N. on the decl. arc. and determined the meridian with the solar at the W. C. of secs. 1, 6, 7, and 12. April 20, 1905.

North between secs. 1 and 6.

Over swampy pond, measuring on the ice, bears N. W. and S. E.

12.80 North edge of pond bears N. W. and S. E. enter timber .

18.32 Intersect U. S. Military Trail which bears N. 45° W. and S. 45° E.

18.46 Intersects U. S. Telegraph Line, bears N. 42° W. and S. 42° E.

No difference in measurement between the two sets of chainmen.

40.00 Set a slatestone 13 X 10 X 6 ins. 9 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face, from which,

A spruce 7 ins. diam. bears N. 72° E. 19 lks. dist. marked 1/4 S 6 B T .

A spruce 12 ins. diam. bears S. 14° 15' W. 48 lks. dist. marked 1/4 S 1 B T .

70.00 Enter burned timber, bears E. and W.

No difference in measurement between the two sets of chainmen.

80.00 ~~Set a lavastone 12 X 8 X 8 ins. 8 ins. in the ground for cor. of Tps. 1 and 2 N. Rs. 1 E. and 1 W. marked T 2 N on northeast , R 1 E on S. E. T 1 N on S. W. and R 1 W on N. W. faces with six notches on each edge; dig pits 24 X 24 X 12 ins. on each line N.,E., and W. four feet and S. of stone 8 ft. dist. and raise a mound of earth 5 ft. base, 2 1/2 ft.~~

See corrected notes, page 79

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Chains ~~high S. of cor.~~ see corrected notes page 79

Land level.

Soil 1st and 2nd rate. Timber, spruce, willow and aspen.

North between secs. 31 and 36,

Over Level land or slightly ascending.

Through spruce timber partly burned.

No difference in measurement between the two sets of chainmen.

40.00 Set a lavastone 12 X 8 X 7 ins. 8 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face, from which,

A spruce 15 ins. diam. bears N. 30° 40' E. 228 lks. dist. marked 1/4 S 31 B T .

A spruce 6 ins. diam. bears N. 6° 15' W. 241 lks. dist. marked 1/4 S 36 B T .

No difference in measurement between the two sets of chainmen.

80.00 Set a lavastone 12 X 8 X 6 ins. 8 ins. in the ground for cor. of secs. 25, 30, 31 and 36, marked with one notch on S. and 5 notches on N. edges, from which, see corrected notes page 79

A spruce 5 ins. diam. bears N. 6° 10' E. 26 lks. dist. marked T 2 N R 1 E S 30 B T .

A spruce 12 ins. diam. bears S. 59° 58' W. 93 lks. dist. marked T 2 N R 1 W S 36 B T .

A spruce 10 ins. diam. bears S. 37° 50' W. 50 lks. dist. marked T 2 N R 1 W S 36 B T

A spruce 5 ins. diam. bears S. 16° 45' W. 27 lks. dist. marked T 2 N R 1 W S 36 B T .

No B. Ts. suitable in secs. 25 and 31.

Land almost level

Soil 1st and 2nd rate.

Timber spruce

April 21: At this cor. I set off 11° 53' N. on the decl. arc. and at 12h l.m.t. observe the sun on the meridian; the resulting lat. is 61° 54' N.

North bet. secs. 25 and 30,

Chains Over slightly desc. land.

Through spruce timber partly burned.

29.00 Desc. abr. into gulch,

31.00 Bottom of gulch, drains easterly as c.

32.00 Top of bank, over level land.

No difference in measurement between the two sets of chainmen.

40.00 Set a slatestone 12 X 8 X 6 ins. 8 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face, dig pits 18 X 18 X 12 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.

48.00 Desc. slightly.

68.30 Head of small gulch, drains easterly.

79.00 Leave burned timber.

No difference in measurement between the two sets of chainmen.

80.00 Set a lavastone 13 X 10 X 5 ins. 9 ins. in the ground for cor. of secs. 19, 24, 25 and 30 marked with 2 notches on S. and 4 notches on N. edges from which,

~~A spruce 10 ins. diam. bears S. 60° 55' W. 26 lks. dist. marked T 2 N R 1 W S 25 B T.~~

~~A spruce 12 ins. diam. bears N. 61° 45' W. 61 lks. dist. marked T 2 N R 1 W S 24 B T.~~

~~A spruce 10 ins. diam. bears S. 22° 50' E. 82 lks. dist. marked T 2 N R 1 E S 30 B T.~~

~~A spruce 6 ins. diam. bears N. 16° 22' W. 79 lks. dist. marked T 2 N R 1 W S 24 B T.~~

See corrected notes, page 79

Land level and rolling

Soil 1st and 2nd rate.

Timber spruce,

April 21: At 3h p.m. l.m.t. I set off 61° 55' N. on the lat. arc. 11°56' N. on the decl. arc. and determined a meridian with the solar at the cor. of secs. 19, 24, 25 and 30.

Chains April 21, 1905: At my camp which is located upon the U. S. Military Trail about 1 mile W. of the cor. of secs. 19, 24, 25 and 30, T. 2 N R 1 E and 1 W I examine the adjustments of my transit and test the levels and collimation; then to test the solar apparatus by comparing its indications resulting from solar observations made during a.m. and p.m. hours with the meridian determined by observations on Polaris, I proceed as follows:

At 5h p.m. l.m.t. I set off 61° 55' N. on the lat. arc. 11° 57' N. on the decl. arc. and determine with the solar a meridian and mark a point on a peg driven in the ground 2 chs. N. of my station.

At about 11h 30m p.m. l.m.t. I begin to observe the Eastern progress of Polaris in accordance with instructions on page 96 of the manual. When Polaris and Delta are in the same vertical plane I note the time by my watch and continue to follow Polaris for 5 minutes when it is upon the meridian and mark the point thus determined on the peg driven in the ground 2 chs. North of my station.

April 21, 1905.

April 22, 1905: At 7 h a.m. l.m.t. I set off 61° 55' N. on the lat. arc. 12° 11' N. on the decl. arc. and determine with the solar a meridian which I also mark on the peg driven 2 chs. North of my station. As the three points marked upon the peg practically coincide, I conclude that the adjustments of the instrument are satisfactory.

April 22,- Thus I run
N. bet. secs. 19 and 24.
Desc. toward the Klutina River.
Over ground which slopes North-Easterly.

Chains Through heavy spruce timber.

No difference in measurement between the two sets of chainmen.

40.00 ~~Set a slatestone 12 X 10 X 5 ins. 8 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face, from which,~~

See corrected notes page 79

~~A spruce 18 ins. diam. bears S. 49° 30' W. 48 lks. dist. marked 1/4 S 24 B T .~~

~~A spruce 16 ins. diam. bears N. 64° 20' E. 29 lks. dist. marked 1/4 S 19 B T .~~

65.95 Cross cutting of survey line bears E. and W.

78.00 Top of cut bank, bears N. 70° E. and S. 70°W.

Desc. abruptly through burned timber .

No difference in measurement between the two sets of chainmen.

80.00 Set a slatestone 14 X 10 X 8 ins. 10 ins. in the ground for cor. of secs. 13, 18, 19 and 24. marked with three 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 .See corrected notes page 80

Land level and mountainous.

Soil 1st and 4th rate. Timber spruce.

~~North between secs. 13 and 18.~~

See corrected notes, page 80

~~Desc. through burned and open ground~~

~~1.00 Bottom of desc., enter Klutina Valley, course N. 70° E. and S. 70° W., and run over level land.~~

~~26.95 Right bank of Klutina River.~~

~~Set a sandstone 16 X 12 X 7 ins. 12 ins. in the ground for meander cor. of fracl. secs. 13, and 18, marked M C on N. face with 3 grooves on S. face, from which,~~

~~A post 8 X 8 ins. by 8 ft. high bears E. 60 lks. dist. marked M C T 2 N R 1 E S 18 B T .~~

~~I raise a mound of stone 2 ft. base 1 1/2 ft. high S. of cor. pits impracticable.~~

~~28.00 Edge of water. Bank of River 8 ft. high.~~

~~As the ice covers the river I measure directly across.~~

~~36.00 Left bank of Klutina River 8 ft. high.~~

~~River flows N. 80° E.~~

Chains See corrected notes,pages 80 and 81

36.44 Set a lavastone 14 X 12 X 11 ins. 11 ins. in the ground for meander cor.of fracl. secs. 13 and 18, marked M. C. on S. face with 3 grooves on N face, from which,

A cottonwood 16 ins. diam. bears S. 75° W. 156 lks. dist. marked T 2 N R 1 W S 13 M C B T .

A cottonwood 8 ins. diam. bears N. 80° E. 204 lks. dist. marked T 2 N R 1 E S 18 M C B T .

Over level bottom land.

No difference in measurement between the two sets of chainmen.

40.00 Set a granitestone 14 X 8 X 6 ins. 10 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face, from which,

A spruce 6 ins. diam. bears S. 43° W. 174 lks. dist. marked 1/4 S 13 B T .

A spruce 8 ins. diam. bears N. 65° 15' E. 130 lks. dist. marked 1/4 S 18 B T .

From this cor. the U. S. Tel. station bears S.80°E. 17.10 chs. dist.

44.00 Foot of bluff. Asc. abruptly, bears N. 80° E. and S. 80° W.

46.50 Top of bluff 75 ft. high bears same.

Over level land through scattering spruce and aspen and burned timber.

69.00 Desc. abrupt. into Copper River valley, land slopes northerly.

Residence of the U. S. Experimental Farm bears N. 60° 50' E.

71.00 Bottom of bluff, desc. more gradual, bears E. and W.

No difference in measurement between the two sets of chainmen.

80.00 Set a lavastone 20 X 9 X 8 ins. 15 ins. in the ground for cor. of secs. 7, 12, 13 and 18. marked with 4 notches on the S. and 2 notches on N. edges, from which

A spruce 6 ins. diam. bears N. 84° 40' W. ~~174~~ 184 lks. See corrected notes,page 81 dist. marked T 2 N R 1 W S 12 B T .

A spruce 8 ins. diam. bears S. 83° 40' W. 161 lks. dist. marked T 2 N R 1 W S 13 B T .

Chains. A spruce 5 ins. diam. bears S. 49° E. 26 lks. dist. marked T 2 N R 1 E S 18 B T.

A spruce 5 ins. diam. bears N. 84° 15' E. 30 lks. dist. marked T 2 N R 1 E S 7 B T.

Land level and mountainous.

Soil 1st and 4th rate. Timber mostly burned spruce and green aspen.

April 22: At 10 h a.m. l.m.t. I set off 61° 57' N. on the lat. arc. 12° 12' N. on the decl. arc. and determined the meridian with the solar at the cor of secs. 7, 12, 13 and 18.

North bet. secs. 7 and 12.

1.00 Enter cultivated field of U. S. Experimental Farm which extends 18 chs. E. and 12 chs. to W. of line the general direction of the field is N. 75° W. and S. 75° E.

15.30 Wire fence on N. edge of field. Desc. bank 20 ft. high.

21.00 Center of Yetna Creek. 10 lks. wide 1 ft. deep flows S. 60° E. into Copper River.

Over level land through spruce timber.

see corrected notes, page 81

~~39.00~~ Set a lavastone 18 X 16 X 7 ins. 15 ins. in the ground for meander cor. of fracl. secs. 7 and 12, ~~marked M C T 2 N on the N. R 1 E on the E. R 1 W on the W. with 4 notches on the S. side from which,~~

A spruce 7 ins. diam. bears N. 50° W. 30 lks. dist. marked T 2 N R 1 W S 12 M C B T.

A cottonwood 9 ins. diam. bears S. 40° W. 86 lks. dist. marked T 2 N R 1 W S 12 M C B T.

39.60 Right bank of Copper River 12 ft. above mean high water. See corrected notes, page 81

As the river is frozen over I measure directly across.

No difference in measurement between the two sets of chainmen.

40.00 The 1/4 sec. cor. falls in river.

Thence across river bed.

51.00 N. edge of river bed. River flows S. 60° E. for 40 chs.

Along edge of river bar on low ground covered at high water. from 1 to 3 feet deep.

Chains.

60.00 Right edge of high water channel, flows S. 40° E.

63.00 Left edge of high water channel,

Continue along edge of river bar.

72.00 Leave river bar and cross main channel of river.

No difference in measurement between the two sets of chainmen. **See corrected notes, apges 81 & 82**

~~80.00 The cor. of secs. 1, 6, 7, and 12 falls in river bed.~~

There is no suitable place to set a witness cor. as the line runs over land covered in the summer with water. from 1 to 3 feet deep.

Land level.

Soil 2nd and 4th rate. Scattering timber on 39 chs.

North bet. secs. 1 and 6.

Over ice in river channel.

6.00 Edge of gravel bar on right side of channel. bears S. 10° W. and N. 10° E.

Thence along the bar over drift-wood and a few scattering alder bruch.

15.00 Leave gravel bar and cross main channel.

At this point the right bank of Copper River is 2 chs. W. and the left bank 10 chs. E.

No difference in measurement between the two sets of chainmen.

40.00 The 1/4 sec. cor. between secs. 1 and 6 falls in river bed. **See corrected notes page 82**

There being no suitable place to set a witness cor on the right bank of the river, I continue the line across the river.

54.00 Edge of bar on left side of river.

As this bar is overflowed in the summer and is not suitable for establishing a cor. upon, I continue the line to higher ground.

59.00 Left bank of Copper River, bears N. 20° W. and S. 20° E.

60.00 Set a slatestone 12 X 10 X 10 ins. 9 ins. in the ground for meander cor. of fracl. secs. 1 and 6, marked M C with 5 grooves on S. T 2 N on N. R 1 E on E. and R 1 W on W. faces from which,

Chains. A spruce 7 ins. diam. bears N.16° 30' W. 7 lks. dist. marked T. 2 N R 1 W S 1 M C B T.

A spruce 5 ins. diam. bears N. 74° 20' E. 18 lks. dist. marked T 2 N R 1 E S 6 M C B T.

A spruce 12 ins. diam. bears S. 4° 40' W. 20 lks. dist. marked T 2 N R 1 W S 1 M C B T.

A spruce 8 ins. diam. bears S. 47° E. 25 lks. dist. marked T 2 N R 1 E S 6 M C B T.

Over ground slightly asc. through spruce timber and undergrowth.

69.00 Asc. abruptly. ground slopes S. 80° W.

71.00 Top of bench 40 ft. high, bears N. 10° W. and S. 10° E.

Over level land.

No difference in measurement between the two sets of chainmen.

80.00 Set a sandstone 12 X 8 X 7 ins. 9 ins. in the ground for cor. of Tps. 2 and 3 N. Rs. 1 E and 1 W. marked T 3 N on N.E., R 1 E on S.E., T 2 N on S.W., and R 1 W on N.W., faces, with 6 notches on each edge from which,

A spruce 6 ins. diam. bears N. 40° 50' W. 17 lks. dist. marked T 3 N R 1 W S 36 B T.

A spruce 8 ins. diam. bears N. 82° 25' E. 22 lks. dist. marked T 3 N R 1 E S 31 B T

A spruce 5 ins. diam. bears S. 35° 50' E. 23 lks. dist. marked T 2 N R 1 E S 6 B T.

A spruce 10 ins. diam. bears S. 32° W. 13 lks dist. marked T 2 N R 1 W S 1 B T.

Land mostly level, Soil 4th rate.

Timber spruce, alder and willows on 20 chs.

I make no observation on the sun for meridian as the sky is overcast in the afternoon.

April 22, 1905.

North bet. secs. 31 and 36.

Desc. abruptly over bank, bears N. 10° E. and S. 10° W. through spruce timber.

1.00 Foot of desc. 30 ft. below top of bench.

Over level land.

Chains.

No difference in measurement between the two sets of chainmen.

40.00 Set a slatestone 12 X 10 X 6 ins. 9 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face, from which,

A spruce 8 ins. diam. bears S. 6° 45' E. 31 lks. dist. marked 1/4 S. 31 B T .

A spruce 10 ins. diam. bears N. 33° 45' W. 16 lks. dist. marked 1/4 S. 36 B T .

At this cor. on April 24, 9h a.m. l.m.t. I set off 61° 59' N. on the lat. arc. 12° 51' N. on the decl. arc. and determine the meridian with the solar.

58.00 Desc. over bank which bears N. 5° E. to lower land, Through dense spruce, cottonwood and willow.

61.00 Foot of desc. 2o ft. high.

64.00 Asc. gradually.

70.00 Top of slope bears N. 10° W. and S. 10° E.

No difference in measurement between the two sets of chainmen.

80.00 Set a slatestone 16 X 10 X 6 ins. 12 ins. in the ground for cor. of secs. 25, 30, 31 and 36. marked with 1 notch on S. and 5 notches on N. edges, from which,

A spruce 18 ins. diam. bears N. 8° W. 64 lks. dist. marked T 3 N R 1 W S 25 B T .

An aspen 8 ins. diam. bears N. 84° 30' E. 54 lks. dist. marked T 3 N R 1 E S 30 B T ?

An aspen 10 ins. diam. bears S. 64° E. 10 lks. dist. marked T 3 N R 1 E S 31 B T .

An aspen 8 ins. diam. bears S. 40° W. 4 lks. dist. marked T 3 N R 1 W S 36 B T .

Land level and mountainous. Soil 1st and 4th rate.

Timber spruce, aspen, cottonwood, willow and alder, on 80 chs.

North bet. secs. 25 and 30.

Over level land through thick timber.

15.39 Asc. abruptly 20° slope.

23.70 Top of ascent. Land slopes S. 80° W. Desc. 10° slope

Chains.

34.00 Bottom of gulch with small creek, drains westerly into Copper River.

Asc. abruptly.

39.85 Top of bluff, 300 ft. above Copper River, bears E. and W.

No difference in measurement between the two sets of chainmen.

40.00 Set a slatestone 12 X 8 X 8 ins. 9 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face from which,

A spruce 8 ins. diam. bears S. 39° 15' E. 11 lks. dist. marked 1/4 S. 30 B T .

A spruce 8 ins. diam. bears N. 78° 20' W. 14 lks. dist. marked 1/4 S. 25 B T .

54.00 Desc. into gulch 30° slope.

55.50 Bottom of gulch drains W. asc. 30° slope.

57.00 Top of asc. bears E. and W. over level land.

No difference in measurement between the two sets of chainmen.

80.00 Set a slatestone 14 X 10 X 9 ins. 10 ins. in the ground for cor. of secs. 19, 24, 25, and 30. marked with 2 notches on S. and 4 notches on N. edges, from which,

A spruce 16 ins. diam. bears S. 62° E. 97 lks. dist. marked T 3 N R 1 E S 30 B T .

A spruce 16 ins. diam. bears S. 36° 50' W. 98 lks. dist. marked T 3 N R 1 W S 25 B T .

A spruce 18 ins. diam. bears N. 76° 20' W. 116 lks. dist. marked T 3 N R 1 W S 24 B T .

A spruce 18 ins. diam. bears N. 58° 35' E. 57 lks. dist. marked T 3 N R 1 E S 19 B T .

Land level and mountainous.

Soil 1st and 4th rate. Timber mostly spruce.

April 24: At this corner I set off 12° 53' N. on the decl. arc. and at 12h l.m.t. observed the sun on the meridian, theresulting lat. is 62° 01' N.

North bet. secs. 19 and 24.

Over level land through sprude timber.

Chains.

14.74 Desc. 20° slope into gulch.

17.70 Bottom of gulch, creek 4 lks. wide, flows N. 60° W. Asc. 25° slope.

20.74 Top of ascent, course N. 60° W. and S. 60° E. over slightly rising land.

33.00 Enter burned timber, bears E. and W.

No difference in measurement between the two sets of chainmen.

40.00 Set a slatestone 14 X 7 X 6 ins. 10 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face, from which,

A spruce 10 ins. diam. bears N. 49° 10' W. 38 lks. dist. marked 1/4 S. 24 B T .

A spruce 12 ins. diam. bears S. 85° E. 10 lks. dist. marked 1/4 S. 19 B T .

Leave burned timber bears E. and W.

45.00 Enter burned timber, bears E. and W.

No difference in measurement between the two sets of chainmen.

80.00 Set a slatestone 12 X 8 X 7 ins. 9 ins. in the ground for cor. of secs. 13, 18, 19, and 24, marked with 3 notches on N. and S. edges; dig pits 18 X 18 X 12 ins. in each sec. 5 1/2 ft. dist. and raise a mound of earth 4 ft. base 2 ft. high W. of cor.

April 24: At this cor. at 3h p.m. l.m.t. I set off 62° 01' N. on the lat. arc. 12° 56' N. on the decl. arc. and determine the meridian with the solar.

Land mostly level and dry.

Soil 1st rate, Timber burned spruce.

North bet. secs. 13 and 18.

Over level land through burned timber.

36.00 Creek bed which is dry most of the year, drains S. 60° W. into Copper River.

No difference in measurement between the two sets of chainmen.

40.00 Set a lavastone 14 X 10 X 5 ins. 10 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face; dig pits 18 X 18X 12 ins. N. and S. of cor. 3 ft. dist and

Chains raise a mound of earth 3 1/2 ft. base 1 1/2 ft. high W. of cor. April 24, 1905.

No difference in measurement between the two sets of chainmen.

80.00 Set a lavastone 12 X 10 X 6 ins. 8 ins. in the ground for cor. of secs. 7, 12, 13 and 18 marked with 4 notches on S. and 2 notches on N. edges, from which, See corrected notes page 82

A spruce 6 ins. diam. bears N. 47° 10' E. 18 lks. dist. marked T 3 N R 1 E S 7 B T .

A spruce 6 ins. diam. bears N. 36° 20' W. 86 lks dist. marked T 3 N R 1 W S 12 B T .

A spruce 6 ins. diam. bears S. 9° 40' E. 57 lks. dist. marked T 3 N R 1 E S 18 B T .

A spruce 8 ins. diam. bears S. 79° 30' E. 18 lks. dist. marked T 3 N R 1 E S 18 B T .

Land level. Soil 1st rate.

Timber scattering spruce, aspen and willow.

April 25: At 8 h a.m. l.m.t. I set off 62°04' N. on the lat. arc. 13° 10' N. on the decl. arc. and determine the meridian with the solar at the cor. of secs. 7, 12, 13 and 18.

North between secs. 7 and 12.

Over level land through scattering spruce and aspen.

No difference in measurement between the two sets of chainmen.

40.00 Set a lavastone 12 X 10 X 10 ins. 8 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face, from which,

A spruce 4 ins. diam. bears N. 49° W. 88 lks. dist. marked 1/4 S. 12 B T .

A spruce 4 ins. diam. bears S. 20° 55' E. 294 lks. dist. marked 1/4 S. 7 B T .

No difference in measurement between the two sets of chainmen.

80.00 Set a lavastone 12 X 8 X 6 ins. 8 ins. in the ground for cor. of secs. 1, 6, 7 and 12 marked with 5 notches on the S. and 1 notch on N. edges; dig pits 18 X 18 X 12 ins. in each sec. 5 1/2 ft. dist. and raise a mound of earth 4 ft. base 2 ft.

Principal Meridian through T. 3 N. bet. Rs. 1 E. and 1 W.

Chains.high west of cor.

Land level. Soil 1st rate.

Timber mostly burned.

T 4 N R 1 E

North bet. secs. 1 and 6

Over level land through scattering spruce and willow.

No difference in measurement between the two sets of chainmen.

40.00 Set a lavastone 12 X 7 X 6 ins. 8 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face; dig pits 18 X 18 X 12 ins. N. and S. of cor. 3 ft. dist. and raise a mound of earth 3 1/2 ft. base 1 1/2 ft. high W. of cor.

43.00 Small depression, drains N. 80° W.

65.00 Enter heavy green timber. bears N. 80° W.

69.00 Leave green timber. Enter burned timber. bears E. and W.

No difference in measurement between the two sets of chainmen.

80.00 Set a lavastone 14 X 10 X 5 ins. 11 ins. in the ground for cor. of Tps. 3 and 4 N. Rs. 1 E. and 1 W. marked T 4 N on N.E., R 1 E on S.E., T 3 N on S.W., and R 1 W on N.W., faces, with 6 notches on each edge, from which,

A spruce 8 ins. diam. bears N. 27° 50' E. 108 lks. dist. marked T 4 N R 1 E S 31 B T .

A spruce 8 ins. diam. bears N. 31° 40' W. 109 lks. dist. marked T 4 N R 1 W S 36 B T .

A spruce 6 ins. diam. bears S. 23° 20' E. 44 lks. dist. marked T 3 N R 1 E S 6 B T .

A spruce 8 ins. diam. bears S. 54° 06' W. 54 lks. dist. marked T 3 N R 1 W S 1 B T .

Land level and rolling.

Soil 1st rate. Timber spruce.

Note:- The sun was partly hidden at noon, making observation for lat. impossible.

North bet. secs. 31 and 36.

Over level land through spruce timber.

Chains.

4.00 Enter meadow, bears E. and W.

21.00 Leave meadow, enter timber, bears E. and W.

28.80 Enter meadow covered with ice, bears E. and W.

36.50 Leave meadow, enter timber, bears E. and W.

No difference in measurement between the two sets of chainmen.

40.00 Set a lavastone 12 X 8 X 7 ins. 8 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face, from which,

A spruce 6 ins. diam. bears S. 16° 20' W. 180 lks. dist. marked 1/4 S. 36 B T .

A spruce 5 ins. diam. bears N. 23° E. 302 lks. dist. marked 1/4 S. 31 B T .

No difference in measurement between the two sets of chainmen.

80.00 Set a lavastone 12 X 8 X 8 ins. 8 ins. in the ground for cor. of secs. 25, 30, 31 and 36. marked with 1 notch on S. and 5 notches on N. edges, from which,

A spruce 5 ins. diam. bears N. 21°10' E. 41 lks. dist. marked T 4 N R 1 E S 30 B T .

A spruce 5 ins. diam. bears N. 26° 35' W. 78 lks. dist. marked T 4 N R 1 W S 25 B T .

A spruce 14 ins. diam. bears S. 29° 16' W. 219 lks. dist. marked T 4 N R 1 W S 36 B T .

A spruce 10 ins. diam. bears S. 5° 20' E. 267 lks. dist. marked T 4 N R 1 E S 31 B T .

Land level. Soil 1st rate.

Timber scattering spruce, partly burned.

April 25, 1905.

North bet. secs. 25 and 30.

Over level land, enter green timber, bears E. and W.

No difference in measurement between the two sets of chainmen.

40.00 Set a lavastone 12 X 9 X 6 ins. 8 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face from which,

Chains A spruce 12 ins. diam. bears N. 67° 50' W. 25 lks. dist. marked 1/4 S. 25 B T .

An aspen 9 ins. diam. bears S. 73° 10' E. 91 lks. dist. marked 1/4 S. 30 B T .

No difference in measurement between the two sets of chainmen.

80.00 Set a slatestone 13 X 8 X 8 ins. 9 ins. in the ground for cor. of secs. 19, 24, 25 and 30. marked with 2 notches on S. and 4 notches on N. edges, from which,

A spruce 8 ins. diam. bears S. 30° 15' W. 181 lks. dist. marked T 4 N R 1 W S 25 B T .

A spruce 8 ins. diam. bears S. 59° E. 30 lks. dist. marked T 4 N R 1 E S 30 B T .

A spruce 10 ins. diam. bears N. 31° 20' W. 13 lks. dist. marked, T 4 N R 1 W S 24 B T .

A spruce 5 ins. diam. bears N. 55°15' E. 17 lks. dist. marked T 4 N R 1 E S 19 B T .

Land level. Soil 1st rate.

Heavy timber on 80 chs.

April 26: At 9h a.m. l.m.t. I set off 62° 06' N. on the lat. arc. 13° 30' N. on the decl. arc. and determine a true meridian with the solar.

North bet. secs. 19 and 24.

Over rolling land and heavy timber.

30.00 Desc. 24° slope into ravine.

34.00 Edge of overflow ice in bottom of ravine.

35.00 Across overflow ice, ravine drains W.

Asc. to bench or flat, bears E. and W.

No difference in measurement between the two sets of chainmen.

40.00 Set a lavastone 12 X 7 X 6 ins. 8 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face, from which,

An aspen 8 ins. diam. bears S. 49° 15' E. 4 lks. dist. marked 1/4 S. 24 B T .

An aspen 6 ins. diam. bears N. 49° 32' E. 32 lks. dist. marked 1/4 S. 19 B T .

Continue to ascend.

43.00 Top of slope, bears E. and W. over level land.

chains.

63.00 South edge of grassy pond, bears E. and W.

68.00 North edge of grassy pond, bears N. E. and S. W.

enter timber.

No difference in measurement between the two sets of chainmen.

80.00 Set a lavastone 12 X 9 X 8 ins. 8 ins. in the ground for cor. of secs. 13, 18, 19 and 24, marked with 3 notches on N. and S. edges, from which,

A spruce 10 ins. diam. bears S. 32° W. 34 lks. dist. marked T 4 N R 1 W S 24 B T .

A spruce 12 ins. diam. bears S. 36° 50' E. 41 lks. dist. marked T 4 N R 1 E S 19 B T .

A spruce 12 ins. diam. bears N. 51° 35' W. 22 lks. dist. marked T 4 N R 1 W S 13 B T .

A spruce 10 ins. diam. bears N. 17° 10' E. 35 lks. dist. marked T 4 N R 1 E S 18 B T .

Land level and rolling. Soil 1st and 4th rate. Timber spruce, aspen and cottonwood.

North bet. secs. 13 and 18.

Over level land through thick timber.

10.00 The mag. variation at this point is 29° E.

18.00 The mag. variation at this point is 29° 30' E.

No difference in measurement between the two sets of chainmen.

40.00 Set a lavastone 12 X 8 X 6 ins. 8 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face, from which,

A spruce 5 ins. diam. bears S. 20° W. 9 lks. dist. marked 1/4 S. 13 B T .

A spruce 5 ins. diam. bears S. 87° E. 39 lks. dist. marked 1/4 S. 18 B T .

No difference in measurement between the two sets of chainmen.

80.00 Set a lavastone 12 X 10 X 8 ins. 8 ins. in the ground for cor. of secs. 7, 12, 13 and 18 marked with 4 notches on S. and 2 notches on N. edges, from which,

A spruce 6 ins. diam. bears S. 23° 20' E. 15 lks. dist. marked T 4 N R 1 E S 18 B T .

Chains A spruce 12 ins. diam. bears S. 54° 45' W. 39 lks. dist. marked T 4 N R 1 W S 13 B T .

A spruce 8 ins. diam. bears N. 30° 45' W. 29 lks. dist. marked T 4 N R 1 W S 12 B T .

A spruce 16 ins. diam. bears N. 54° 15' E. 54 lks. dist. marked T 4 N R 1 E S 7 B T .

Land level. Soil 1st rate.

Timber, Spruce.

North bet. secs. 7 and 12.

Over level land through dense spruce,

39.00 Enter meadow, course N.W. and S. E.

No difference in measurement between the two sets of chainmen.

40.00 Set a lavastone 12 X 7 X 6 ins. 8 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face, from which,

A spruce 8 ins. diam. bears S. 37° 30' E. 149 lks. dist. marked 1/4 S. 7 B T .

A spruce 6 ins. diam. bears S. 50° W. 113 lks. dist. marked 1/4 S. 12 B T .

48.50 Entered timber, course N. W. and S. E.

67.00 Edge of meadow or swamp.

70.00 Enter timber, course E. and W.

No difference in measurement between the two sets of chainmen.

80.00 Set a lavastone 12 X 7 X 6 ins. 8 ins. in the ground for cor. of secs. 1, 6, 7 and 12, marked with 5 notches on S. and 1 notch on N. edges, from which

A spruce 5 ins. diam. bears S. 27° 10' W. 17 lks. dist. marked T 4 N R 1 W S 12 B T .

A spruce 6 ins. diam. bears S. 37° 45' E. 48 lks. dist. marked T 4 N R 1 E S 7 B T .

A spruce 6 ins. diam. bears N. 66° 30' E. 27 lks. dist. marked T 4 N R 1 E S 6 B T .

A spruce 4 ins. diam. bears N. 78° 20' W. 29 lks. dist. marked T 4 N R 1 W S 1 B T .

Land level and covered with patches of open meadow land, generally wet .

Soil clay and loam, 1st rate.

Timber thick spruce and willow. April 26, 1905.

Chains. North bet. secs. 1 and 6.

Over level land, through thick spruce timber.

5.00 Enter W. side of 15 acre meadow, course N. W.

10.50 Leave meadow, enter timber, course S. W.

15.00 Enter meadow, course N. W.

27.00 Leave meadow, enter timber, course N. W.

35.00 Enter meadow, course N. W.

39.00 Enter timber, course N. W.

No difference in measurement between the two sets of chainmen.

40.00 Set a lavastone 12 X 9 X 6 ins. 8 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face, from which,

An aspen 8 ins. diam. bears N. 81° W. 10 lks. dist. marked 1/4 S. 1 B T.

A spruce 6 ins. diam. bears S. 44° 40' E. 27 lks. dist. marked 1/4 S. 6 B T.

56.50 South edge of lake, covered with ice, course N. W.

58.50 North edge of lake, course N. E. enter timber.

67.00 South edge of lake, bears E. and W.

70.00 North edge of lake, bears E. and W. enter timber.

No difference in measurement between the two sets of chainmen.

80.00 Set a sandstone 12 X 10 X 8 ins. 8 ins. in the ground for cor. of Tps. 4 and 5 N. Rs. 1 E. and 1 W. marked T 5 N on N. E., R 1 E on S. E., T 4 N on S. W., R 1 W on N. W., faces with 6 notches on each edge, from which,

An aspen 8 ins. diam. bears S. 8° 50' W. 28 lks. dist. marked T 4 N R 1 W S 1 B T.

A spruce 10 ins. diam. bears S. 33° 45' E. 16 lks. dist. marked T 4 N R 1 E S 6 B T.

A spruce 5 ins. diam. bears N. 36° 35' E. 28 lks. dist. marked T 5 N R 1 E S 31 B T.

An aspen 12 ins. diam. bears N. 86° 35' W. 49 lks. dist. marked T 5 N R 1 W S 36 B T.

Land level and wet in low places.

Soil clay and 1st rate.

Timber spruce and aspen.

April 27: At 10h a.m. l.m.t. I set off 62° 09' N. on the lat. arc. 13° 50' N. on the decl. arc.

Chains. and determine the meridian with the solar at the cor. of Tps. 4 and 5 N. Rs. 1E. and 1 W.

North bet. secs. 31 and 36.

Over level land through dense timber.

2.50 Enter meadow, course E. and W.

11.00 Enter timber, course E. and W.

29.50 Desc. abruptly into gulch , bears N. 60° W. and S. 60° E. 30° slope.

32.00 Foot of descent, edge of overflow ice. 1 to 3 ft. (thick.

32.50 Creek channel 20 lks. wide, flows N. 60° W.

33.00 North edge of overflow ice. Asc. gradually out of gulch.

No difference in measurement between the two sets of chainmen.

40.00 Set a lavastone 12 X 9 X 9 ins. 8 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face, from which,

An aspen 8 ins. diam. bears S. 17° 30' W. 12 lks. dist. marked 1/4 S. 36 B T .

An aspen 8 ins. diam. bears S. 55° 15' E. 22 lks. dist. marked 1/4 S. 31 B T .

45.75 Brook 8 lks. wide, flows N. 75° W.

48.25 Asc. abruptly 25° slope.

54.00 Top of slope, bears N. 75° W. over level land.

68.50 Enter meadow, course E. and W.

74.00 Enter timber, course E. and W.

77.00 Enter burned timber, course E. and W.

No difference in measurement between the two sets of chainmen.

80.00 Set a lavastone 12 X 7 X 6 ins. 8 ins. in the ground for cor. of secs. 25, 30, 31 and 36, marked with 1 notch on S. and 5 notches on N. edges, from which,

A spruce 10 ins. diam. bears N. 61° 25' W. 46 lks. dist. marked T 5 N R 1 W S 25 B T .

A spruce 5 ins. diam. bears S. 53° 50' W. 122 lks. dist. marked T 5 N R 1 W S 36 B T .

An aspen 6 ins. diam. bears N. 63° 30' E. 76 lks. dist. marked T 5 N R 1 E S 30 B T .

Chains. A spruce 6 ins. diam. bears S. 61° 40' E. 65 lks. dist. marked T 5 N R 1 E S 31 B T .

Land level and mountainous.

Soil 1st and 2nd rate.

Timber spruce, aspen and willow.

April 27, At this cor. I set off 13°50 N. on the decl. arc. and at 11h 58 m. L.m.t. I observe the sun on the meridian, the resulting lat. is 62° 10' N. ✓

North bet. secs. 25 and 30.

Over level land through burned timber and willow undergrowth.

13.00 Enter meadow, course N. W.

33.00 Enter timber, course N. W.

No difference in measurement between the two sets of chainmen.

40.00 Set a lavastone 12 X 10 X 6 ins. 8 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face from which,

A spruce 10 ins. diam. bears N. 34° 50' E. 28 lks. dist. marked 1/4 S. 30 B T .

A spruce 10 ins. diam. bears N. 35° 10' W. 8 lks. dist. marked 1/4 S. 25 B T .

Through scattering scrubby spruce.

No difference in measurement between the two sets of chainmen.

80.00 Set a lavastone 12 X 8 X 9 ins. 8 ins. in the ground for cor. of secs. 19, 24, 25 and 30 marked with 2 notches on S. and 4 notches on N. edges, dig pits 18 X 18 X 12 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 level. Soil clay, 1st rate.

Timber, scrubby spruce. ✓

North bet. secs. 19 and 24.

Over level land through spruce timber.

No difference in measurement between the two sets of chainmen.

40.00 Set a lavastone 12 X 9 X 6 ins. 8 ins. in the

Chains. ground for 1/4 sec. cor. marked 1/4 on W. face, from which,

A spruce 7 ins. diam. bears S. 3° 10' W. 32 lks. dist. marked 1/4 S. 24 B T .

A spruce 6 ins. diam. bears S. 8° 40' E. 68 lks. dist. marked 1/4 S. 19 B T .

No difference in measurement between the two sets of chainmen.

80.00 Set a lavastone 15 X 9 X 7 ins. 11 ins. in the ground for cor. of secs. 13, 18, 19 and 24. marked with 3 notches on N. and S. edges, from which,

A spruce 7 ins. diam. bears N. 8° 02' W. 111 lks. dist. marked T 5 N R 1 W S 13 B T .

A spruce 6 ins. diam. bears S. 41° 30' W. 22 lks. dist. marked T 5 N R 1 W S 24 B T .

A spruce 12 ins. diam. bears S. 77° 10' E. 52 lks. dist. marked T 5 N R 1 E S 19 B T .

A spruce 6 ins. diam. bears N. 39° 20' E. 50 lks dist. marked T 5 N R 1 E S 18 B T .

Land level, Soil 1st rate.

Timber spruce.

April 27, 1905.

April 28: At 9h a.m. l.m.t. I set off 62° 12' N. on the lat. arc. 14° 08' N. on the decl. arc. and determine the meridian at cor. of secs. 13, 18, 19, and 24.

North bet. secs. 13 and 18.

Mag. variation 30° 30' E.

Over level land through spruce and cottonwood timber.

No difference in measurement between the two sets of chainmen.

40.00 Set a lavastone 12 X 9 X 8 ins. 8 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face, from which,

A spruce 14 ins. diam. bears S. 44° 10' W. 116 lks. dist. marked 1/4 S. 13 B T .

A spruce 5 ins. diam. bears S. 17° 25' E. 182 lks. dist. marked 1/4 S. 18 B T .

Chains. No difference in measurement between the two sets of chainmen.

80.00 Set a lavastone 12 X 9 X 8 ins. 8 ins. in the ground for cor. of secs. 7, 12, 13 and 18, marked with 4 notches on S. and 2 notches on N. edges, dig pits 18 X 18 X 12 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 level; Soil 1st rate.

Timber spruce and cottonwood.

April 28: At 11h 57m l.m.t. I set off 14° 09' N. on the decl. arc. and observe the sun on the meridian, the resulting lat. is 62° 13' N.

North bet. secs. 7 and 12.

Over level land through spruce and cottonwood.

26.00 Enter burned timber, bears N. W.

No difference in measurement between the two sets of chainmen.

40.00 Set a lavastone 12 X 9 X 7 ins. 8 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face, from which ,

A spruce 6 ins. diam. bears N. 35° W. 90 lks. dist. marked 1/4 S. 12 B T .

A spruce 10 ins. diam. bears S. 55° 20' E. 50 lks. dist. marked 1/4 S. 7 B T .

No difference in measurement between the two sets of chainmen.

80.00 Set a lavastone 13 X 9 X 6 ins. 9 ins. in the ground for cor. of secs. 1, 6, 7, and 12, marked with 5 notches on S. and 1 notch on N. edges,- dig pits 18 X 18 X 12 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 level, Soil 1st rate.

Timber spruce mostly burned.

April 28, 1905.

North bet. secs. 1 and 6.

Over level land through burned spruce timber.

Chains. No difference in measurement between the two sets of chainmen.

40.00 Set a lavastone 13 X 9 X 7 ins. 9 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face from which,

A spruce 9 ins. diam. bears N. 27° 20' W. 228 lks. dist. marked 1/4 S. 1 B T .

A spruce 6 ins. diam. bears N. 30° 32' E. 192 lks. dist. marked 1/4 S. 6 B T .

April 29: At 9h a.m. l.m.t. I set off 62° 14' N. on the lat. arc. 14° 27' N. on the decl. arc. and determine the meridian with the solar at 1/4 sec. cor. bet. secs. 1 and 6.

The mag. variation is 30° 30' E.

42.00 Enter thick green spruce timber, bears N. W.

No difference in measurement between the two sets of chainmen.

80.00 Set a lavastone 12 X 11 X 6 ins. 8 ins. in the ground for cor. of Tps. 5 and 6 N. Rs. 1 E. and 1 W. marked T 6 N on N. E., R 1 E on S. E., T 5 N on S. W., and R 1 W on N. W., faces with 6 notches on each edge from which,

A spruce 4 ins. diam. bears N. 23° W. 10 lks. dist. marked T 6 N R 1 W S 36 B T .

A spruce 4 ins. diam. bears S. 53° 10' E. 33 lks. dist. marked T 5 N R 1 E S 6 B T .

A spruce 4 ins. diam. bears N. 43° 15' E. 27 lks. dist. marked T 6 N R 1 E S 31 B T .

A spruce 4 ins. diam. bears S. 44° 50' W. 23 lks. dist. marked T 5 N R 1 W S 1 B T .

Land level Soil 1st rate.

Timber spruce.

North bet. secs. 31 and 36.

Over level land through spruce timber.

3.00 Enter burned timber, bears E and W.

No difference in measurement between the two sets of chainmen.

40.00 Set a lavastone 12 X 7 X 6 ins. 8 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face, from which,

A spruce 10 ins. diam. bears S. 51° 45' W. 15 lks.

Chains. dist. marked 1/4 S. 36 B T .

A spruce 10 ins. diam. bears S. 81° 30' E. 167 lks. dist. marked 1/4 S. 31 B T .

April 29: At 11h 57m 1.m.t. I set off 14° 28' N. on the decl. arc. and determine the lat. to be 62° 15' N.

49.00 Enter meadow bears E. and W.

53.00 Enter timber, bears E. and W.

No difference in measurement between the two sets of chainmen.

80.00 Set a lavastone 13 X 7 X 6 ins. 9 ins. in the ground for cor. of secs. 25, 30, 31 and 36, marked with 1 notch on S. and 5 notches on N. edges; dig pits 18 X 18 X 12 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 level; Soil 1st rate.

Timber spruce partly burned.

North bet. secs. 25 and 30.

Over level land through spruce timber.

12.00 Desc. 10° slope.

15.55 Desc. 30° slope

19.35 Center of creek 20 lks. wide 1 ft. deep, flows W. Asc. 35° slope.

22.55 Top of ascent, course E. and W., over level land.

33.50 Desc. 14° slope into ravine.

36.50 Creek 10 lks. wide in bottom of ravine, drains Westerly. asc.

38.00 Top of bench, bears E. and W. over level land.

No difference in measurement between the two sets of chainmen.

40.00 Set a lavastone 14 X 7 X 6 ins. 10 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face; dig pits 18 X 18 X 12 ins. N. and S. 3 ft. dist.- and raise a mound of earth 3 1/2 ft. base 1 1/2 ft. high W. of cor. April 29, 1905.

41.00 Desc. 10° slope.

42.50 Bottom gulley drains S. W. asc. 10° slope.

43.75 Top of slope, course S. W. and N. E.

Chains.

49.00 Desc. 12° slope.

51.00 Bottom of gulley, drains S. W.

52.50 Top of ridge, bears N. E. and S. W. Desc. into Copper Riber bottom.

78.00 Enter level bottom land.

No difference in measurement between the two sets of chainmen.

80.00 Set a lavastone 14 X 8 X 6 ins. 10 ins. in the ground for cor. of secs. 19, 24, 25 and 30, marked with 2 notches on S. and 4 notches on N. edges, from which,

A spruce 16 ins. diam. bears S. 40° 30' W. 193 lks. dist. marked T 6 N R 1 W S 25 B T .

No other trees within 3 chs.: dig pits 18 X 18 X 12 ins. in each sec. 5 1/2 ft. dist. and raise a mound of earth 4 ft. base and 2 ft. high W. of cor.

Land mountainous and level.

Soil 1st and 4th rate. Timber spruce.

May 1, 1905: at 10h a.m. l.m.t. I set off 62° 16' N. on the lat. arc. 15° 04' N. on the decl. arc. and determine the meridian with the solar.

North bet. secs. 19 and 24.

Over level river bottom through spruce and alder timber.

No difference in measurement between the two sets of chainmen.

40.00 Set a lavastone 14 X 8 X 6 ins. 10 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face, from which,

A spruce 9 ins. diam. bears N. 63° 20' E. 34 lks. dist. marked 1/4 S. 19 B T .

A spruce 9 ins. diam. bears N. 25° W. 75 lks. dist. marked 1/4 S. 24 B T .

48.00 South edge of old channel of Copper River, bears S. E. and N. W.

49.50 North edge of same channel,

Through dense growth of alder and cottonwood.

66.70 Left bank of Copper River. bears N. E. and S. W.

Chains Set a slatestone 14 X 9 X 6 ins. 10 ins. in the ground for meander cor. of fracl. secs. 19 and 24, ~~marked M C on N. R 1 E on E. R 1 W on W., T 6 N with 2 grooves on S. faces, from which~~, See corrected notes page 82

A cottonwood 6 ins. diam. bears N. 61° 15' E. 3 lks. dist. marked T 6 N R 1 E S 19 M C B T.

A cottonwood 6 ins. diam. bears S. 42° 30' W. 31 lks. dist. marked T 6 N R 1 W S 24 M C B T.

74.00 Point on river bar for triangulation, and S. edge of main channel, bears N. E. and S. W.

No difference in measurement between the two sets of chainmen.

80.00 The point for cor. of secs. 13, 18, 19 and 24, falls in the main channel of river. To determine the distance across I set a point on line on right bank of river. As there is not a suitable place for a base line on the left bank, I leave a flag at 74 chs. and from the point on right side of the river I measure a base line S. 72° 30' W. 19 chs. From the W. end of the base the flag bears S. 27° 58' E. By separate measurements of each angle they are found to be respectively 72° 30', 27° 58' and 79° 32' their sum being 180°. I compute the distance across the river as follows,

$$\frac{\text{Sin } 79° 32'}{\text{Sin } 27° 58'} \text{ X base or } \frac{.98336 \text{ X } 19.00}{.46896} = 39.84 \text{ chs.}$$

also 74.00 + 39.84 = 113.84 chs.

From cor. of secs. 19, 24, 25 and 30 to cor. of secs. 13, 18, 19 and 24.

Land level; Soil 1st to 4th rate.

Timber spruce, cottonwood, alder and willow.

North bet. secs. 13 and 18.

Over channels of Copper River which flow S. 80° W.

19.00 North side of main channel of river, course S. 80° W.; thence over gravel bar at confluence of Copper River and the Gakona River.

29.00 South side of channel of Gakona River which flows S. 45° W. into the Copper River. See corrected notes page 83

32.84 ~~33.00~~ North side of channel of Gakona River.

33.84 Triangulation point at E. end of base line on right bank of Gakona, 30 ft. above river bottom.

Chains Set a lavastone 14 X 10 X 8 ins. 10 ins in the ground for meander cor. for fracl. secs. 13, and 18, ~~marked M C on S., T 6 N on N., R 1 E on E., and R 1 W on W., faces, from which,~~ see corrected notes page 83

~~A spruce 8 ins. diam. bears N. 7° 30' W. 66 lks. dist. marked M C T 6 N R 1 W S 13 B T .~~

~~A spruce 5 ins. diam. bears N. 85° 30' E. 104 lks. dist. marked M C T 6 N R 1 E S 18 B T .~~

Enter spruce timber, bears N. 45° E. and S. 45° W. and run over level land.

37.78 Intersect U. S. Military Road and Tel. line which bears N. 57° E. and S. 57° W.

No difference in measurement between the two sets of chainmen.

40.00 Set a granitestone 12 X 8 X 8 ins. 8 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face, from which,

A spruce 4 ins. diam. bears S. 86° 30' W. 16 lks. dist. marked 1/4 S. 13 B T .

A spruce 5 ins. diam. bears S. 80° 30' E. 24 lks. dist. marked 1/4 S. 18 B T .

45.00 Foot of bluff, bears N. E. and S. W. asc. 35° Slope, out of valley.

53.00 Top of bluff, 300 ft. above river, bears N. 45° E. and S. 45° E. enter dense willow brush.

George Rorers Trading Post bears S. 69° 25' E. about 25 chs. dist.

Indian Stickman's cabin bears E. 15 chs. dist.

74.00 Enter spruce timber, bears E. and W.

No difference in measurement between the two sets of chainmen.

80.00 Set a granite stone 14 X 9 X 5 ins. 10 ins in the ground for cor. of secs. 7, 12, 13 and 18, marked with 4 notches on S. and 2 notches on N. edges, from which

A spruce 8 ins. diam. bears N. 6° E. 30 lks. dist. marked T 6 N R 1 E S 7 B T .

A spruce 6 ins. diam. bears S. 40° 30' E. 11 lks. dist. marked T 6 N R 1 E S 18 B T .

A spruce 10 ins. diam. bears S. 12° 45' W. 36 lks. dist. marked T 6 N R 1 W S 13 B T .

Chains A spruce 8 ins. diam. bears N. 2° W. 36 lks. dist. marked T 6 N R 1 W S 12 B T .

Land level and mountainous.

Soil 1st to 4th rate.

Timber spruce, willow and cottonwood.

Observation for testing solar apparatus appended this book of notes. May 1, 1905.

May 25, 1905. At 8 h a.m. l.m.t. I set off 62° 18' N. on the lat. arc. 20° 57' N. on the decl. arc. and determine the meridian with the solar at the cor. of secs. 7, 12, 13 and 18 established on May 1, 1905. North bet. secs. 7 and 12.

Over level land through spruce and aspen timber.

No difference in measurement between the two sets of chainmen.

40.00 Set a slatestone 12 X 9 X 5 ins. 8 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face, from which ,

A spruce 8 ins. diam. bears N. 70° E. 13 lks. dist. marked 1/4 S. 7 B T .

A spruce 6 ins. diam. bears S. 22° 10' W. 13 lks. dist. marked 1/4 S. 12 B T .

No difference in measurement between the two sets of chainmen.

80.00 Set a slatestone 12 X 11 X 5 ins. 8 ins. in the ground for cor. of secs. 1, 6, 7, and 12, marked with 5 notches on S. and 1 notch on N. edges, from which,

A spruce 4 ins. diam. bears N. 13° E. 4 lks. dist. marked T 6 N R 1 E S 6 B T .

A spruce 10 ins. diam. bears S. 63° E. 27 lks. dist. marked T 6 N R 1 E S 7 B T .

A spruce 6 ins. diam. bears N. 43° 45' W. 42 lks. dist. marked T 6 N R 1 W S 1 B T .

A spruce 6 ins. diam. bears S. 34° 20' W. 39 lks. dist. marked T 6 N R 1 W S 12 B T .

Land level: Soil 1st rate.

Timber spruce, aspen and willow.

May 25: At this cor. I set off 20° 58' N. on the decl. arc. and at 11h 57m a.m. l.m.t. observed the sun on the meridian, the resulting lat is 62° 19' N.

Chains. North bet. secs. 1 and 6.

Over level land through spruce timber.

No difference in measurement between the two sets of chainmen.

40.00 Set a slatestone 12 X 12 X 7 ins. 8 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face, from which,

A spruce 6 ins. diam. bears S. 48 ° W. 14 lks. dist. marked 1/4 S. 1 B T .

A spruce 4 ins. diam. bears S. 86° 20' E. 9 lks. dist. marked 1/4 S. 6 B T .

No difference in measurement between the two sets of chainmen.

80.00 Set a granite stone 12 X 9 X 8 ins. 8 ins. in the ground for cor. of Tps. 6 and 7 N. Rs. 1 E. and 1 W. marked T 7 N on N. E., R 1 E on S. E., T 6 N on S. W., and R 1 W on N. W., faces, with 6 notches on each edge, from which,

A spruce 5 ins. diam. bears N. 32° 20' E. 17 lks. dist. marked T 7 N R 1 E S 31 B T .

A spruce 4 ins. diam. bears N. 24° 15' W. 17 lks. dist. marked T 7 N R 1 W S 36 B T .

A spruce 6 ins. diam. bears S. 38° 50' W. 15 lks. dist. marked T 6 N R 1 W S 1 B T .

A spruce 5 ins. diam. bears S. 55° 10' E. 14 lks. dist. marked T 6 N R 1 E S 6 B T .

Land level, Soil 1st rate.

Timber spruce.

May 25 1905.

North bet. secs. 31 and 36.

Over level land through spruce timbet.

No difference in measurement between the two sets of chainmen.

40.00 Set a greenstone 13 X 9 X 7 ins. 9 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face, from which, see corrected notes page 83

A spruce 5 ins. diam. bears ~~N. 85° 30' E.~~ 26 lks. dist. marked 1/4 S. 31 B T .

A spruce 5 ins. diam. bears S. 75° 50' W. 22 lks. dist. marked 1/4 S. 36 B T .

Chains No difference in measurement between the two sets of chainmen.

80.00 Set a granite stone 14 X 6 X 6 ins. 10 ins. in the ground for cor. of secs. 25, 30, 31 and 36, marked with 1 groove on S. and 5 grooves on N. edges, from which,

A spruce 10 ins. diam. bears N. 55° 30' E. 20 lks. dist. marked T 7 N R 1 E S 30 B T .

A spruce 6 ins. diam. bears S. 11° 10' E. 38 lks. dist. marked T 7 N R 1 E S 31 B T .

A spruce 8 ins. diam. bears S. 27° 30' W. 15 lks. dist. marked T 7 N R 1 W S 36 B T .

~~A spruce 8 ins. diam. bears N. 90° W. 6 lks. dist. marked T 7 N R 1 W S 25 B T .~~ See corrected notes page 83

Land level, Soil 1st rate.

Timber, spruce.

May 26: At this cor. I set off 21° 09' N. on the decl. arc. and at 11h 57m a.m. l.m.t. observe the sun upon the meridian, the resulting lat. is 62°21'N.

North bet. secs. 25 and 30.

Over level land through spruce and aspen timber.

30.00 Enter thick grove of aspen, bears E. and W.

No difference in measurement between the two sets of chainmen

40.00 Set a slatestone 16 X 8 X 5 ins. 11 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face, from which,

An aspen 8 ins. diam. bears N. 10° 45' W. 23 lks. dist. marked 1/4 S. 25 B T .

An aspen 8 ins. diam. bears S. 29° 30' E. 22 lks. dist. marked 1/4 S. 30 B T .

63.00 Enter meadow, bears E. and W.

70.00 Enter spruce timber, bears E. and W.

No difference in measurement between the two sets (of chainmen

80.00 Set a slatestone 17 X 8 X 6 ins. 12 ins. in the ground for cor. of secs. 19, 24, 25 and 30, marked with two notches on S. and 4 notches on N. edges, from which,

A spruce 4 inc. diam. bears N. 72° 20' E. 10 lks. dist. marked T 7 N R 1 E S 19 B T .

A spruce 4 ins. diam. bears S. 79° 50' E. 34 lks. dist. marked T 7 N R 1 E S 30 B T .

Chains. A spruce 4 ins. diam. bears S. 28° 40' W. 4 lks. dist. marked T 7 N R 1 W S 25 B T .

A spruce 4 ins. diam. bears N. 40° 15' W. 19 lks. dist. marked T 7 N R 1 W S 24 B T .

Land level. Soil 1st rate.

Timber, spruce and aspen.

May 26: At 4h p.m. l.m.t. I set off 62° 21' N. on the lat. arc. 21° 11' N. on the decl. arc. and determine the meridian with the solar.

May 26, 1905.

North bet. secs. 19 and 24.

Over level land through spruce timber.

No difference in measurement between the two sets of chainmen.

40.00 Set a granitestone 12 X 7 X 6 ins. 8 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face, from which,

A spruce 5 ins. diam. bears N. 76° 15' W. 15 lks. dist. marked 1/4 S. 24 B T .

A spruce 4 ins. diam. bears N. 54° 15' E. 20 lks. dist. marked 1/4 S. 19 B T .

71.00 Enter wet meadow land, bears E. and W.

76.00 Enter Spruce timber, bears E. and W.

No difference in measurement between thetwo sets of chainmen.

80.00 Set a slatestone 16 X 12 X 5 ins. 11 ins. in the ground for cor. of secs. 13, 18, 19 and 24, marked with 3 notches on N. and S. edges, from which

A spruce 16 ins. diam. bears S. 71° W. 31 lks. dist. marked T. 7 N R 1 W S 24 B T .

A willow 5 ins. diam. bears N. 54° 30' W. 8 lks. dist. marked T 7 N R 1 W S 13 B T .

An aspen 10 ins. diam. bears S. 55° E. 3 lks. dist. marked T 7 N R 1 E S 19 B T .

A spruce 8 ins. diam. bears N. 23° 20' E. 20 lks. dist. marked T 7 N R 1 E S 18 B T .

Land level. Soil 1st rate.

Timber, spruce, aspen and willow.

May 27: At this point I set off 21° 19' N. on the decl. arc. and at 11h 57m a.m. l.m.t. observe the sun on the meridian, the resulting lat. is 62°22' N.

Chains. North bet. secs. 13 and 18.

Over level land through spruce and aspen timber.

12.00 Edge of swampy meadow and lake, bears N. 30° E.

In order to get the dist. across the lake, I set a flag on line on N. side, then measure a base N. 24° 44' E. along the margin of lake 9 chs. dist. to a point from which, the flag bears N. 16° 53' W. By separate measurement of each angle they are found to be respectively 24° 44' , 16° 53', and 138° 23' their sum being 180°. I compute the distance as follows: $\frac{\text{Sin } 138° \ 23'}{\text{Sin } 16° \ 53'} \times$ base or $\frac{.66414 \times 9.00}{.29042}$ = 20.58 chs. which added to 12.00 chs. makes

32.58 North edge of swamp and lake. Enter timber, bears S. 45° E.

No difference in measurement between the two sets of chainmen.

40.00 Set a slatestone 18 X 10 X 6 ins. 12 ins. in the ground for 1/4 sec. cor.marked 1/4 on W. face, from which,

A spruce 12 ins. diam. bears N. 50° E. 35 lks. dist. marked 1/4 S. 18 B T .

A spruce 4 ins. diam. bears S. 75° W. 14 lks. dist. marked 1/4 S. 13 B T .

41.00 West edge of 10 acre lake, bears N. and S.

No difference in measurement between the two sets of chainmen.

80.00 Set a slatestone 16 X 8 X 7 ins. 12 ins. in the ground for cor. of secs. 7, 12, 13, and 18, marked with 4 notches on S. and 2 notches on N. edges, from which,

A spruce 4 ins. diam. bears N. 39° E. 17 lks. dist. marked T 7 N R 1 E S 7 B T .

A spruce 4 ins. diam. bears S. 62° 20' E. 26 lks. dist. marked T 7 N R 1 E S 18 B T .

A spruce 4 ins. diam. bears S. 32° 30' W. 20 lks. dist. marked T 7 N R 1 W S 13 B T .

A spruce 4 ins. diam. bears N. 82° W. 19 lks. dist. marked T 7 N R 1 W S 12 B T .

Land level. Soil 1st rate.

Timber, spruce.

May 27, 1905.

Chains. May 29: At 7 h 30m a.m. l.m.t. I set off 62°23' N. on the lat. arc. 21° 37' N. on the decl. arc. and determine the meridian with the solar.

North bet. secs. 7 and 12.

Over level land through spruce timber.

15.00 South edge of meadow, bears E. and W.

23.00 North edge of meadow, bears E. and W. Enter timber.

No difference in measurement between the two sets of chainmen.

40.00 Set a slatestone 14 X 8 X 7 ins. 10 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face, from which

A spruce 5 ins. diam. bears S. 70° E. 10 lks. dist. marked 1/4 S. 7 B T .

A spruce 4 ins. diam. bears N. 81° W. 12 lks. dist. marked 1/4 S. 12 B T .

No difference in measurement between thetwo sets of chainmen.

80.00 Set a slatestone 22 X 8 X 5 ins. 16 1/2 ins. in the ground for cor. of secs. 1, 6, 7 and 12, marked with 5 notches on S. and 1 notch on N. edges, from which,

A spruce 7 ins. diam. bears N. 64° 45' E. 13 lks. dist. marked T 7 N R 1 E S 6 B T .

A spruce 5 ins. diam. bears S. 66° E. 19 lks. dist. marked T 7 N R 1 E S 7 B T .

A spruce 4 ins. diam. bears S. 21° 20' W. 40 lks. dist. marked T 7 N R 1 W S 12 B T .

A spruce 5 ins. diam. bears N. 38° 40' W. 57 lks. dist. marked T 7 N R 1 W S 1 B T .

Land level. Soil 1st rate.

Timber, spruce.

May 29: At this cor. I set off 21° 38' N. on the decl. arc. and at 11h 57m a.m. l.m.t. observe the sun on the meridian, the resulting lat. is 62° 24' N.

The mag. variation is 30° 10' E.

North bet. secs. 1 and 6.

Over level land through spruce timber.

No difference in measurement between the two sets of chainmen.

Chains.

40.00 Set a slatestone 16 X 9 X 6 ins. 12 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face, from which,

A spruce 5 ins. diam. bears N. 44° E. 17 lks. dist. marked 1/4 S. 6 B T .

A spruce 5 ins. diam. bears S. 43° 20' W. 25 lks. dist. marked 1/4 S. 1 B T .

No difference in measurement between the two sets of chainmen.

80.00 Set a slatestone 15 X 11 X 8 ins. 10 ins. in the ground for cor. of Tps. 7 and 8 N. Rs. 1 E. and 1 W. marked T 8 N on N. E., R 1 E on S. E., T 7 N on S. W., and R 1 W on N. W., faces with 6 notches on each edge, from which,

A spruce 6 ins. diam. bears N. 31° 20' E. 17 lks. dist. marked T 8 N R 1 E S 31 B T .

A spruce 6 ins. diam. bears S. 40° E. 10 lks. dist. marked T 7 N R 1 E S 6 B T .

A spruce 6 ins. diam. bears S. 31° 30' W. 22 lks. dist. marked T 7 N R 1 W S 1 B T .

A spruce 9 ins. diam. bears West, 11 lks. dist. marked T 8/N R 1 W S 36 B T .

Land level. Soil 1st rate.

Timber, spruce.

May 29, 1905.

May 30: At this cor. at 8h a.m. l.m.t. I set off 62° 25' N. on the lat. arc. 21° 46' N. on the decl. arc. and determine the meridian with the solar.

North bet. secs. 31 and 36.

Over level land through spruce timber.

32.00 Enter swampy meadow, bears Easterly and Westerly.

No difference in measurement between the two sets of chainmen.

40.00 Set a slatestone 14 X 8 X 6 ins. 10 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face, from which,

A spruce 5 ins. diam. bears N. 75° 30' W. 75 lks. dist. marked 1/4 S. 36 B T .

Principal Meridian through T 8 N bet. Rs. 1 E. and 1 W.

Chains A spruce 4 ins. diam. bears S. 9° 30' E. 75 lks. dist. marked 1/4 S. 31 B T .

48.00 Leave meadow, enter timber, bears Easterly and Westerly.

70.00 Asc. slightly.

75.00 Top of ascent. course E. and W. over level land. No difference in measurement between the two sets of chainmen.

80.00 Set a slatestone 17 X 9 X 7 ins. 12 ins. in the ground for cor. of secs. 25, 30, 31 and 36, marked with 1 notch on S. and 5 notches on N. edges, from which,

A spruce 8 ins. diam. bears N. 45° E. 25 lks. dist. marked T 8 N R 1 E S 30 B T .

A spruce 6 ins. diam. bears S. 36° E. 7 lks. dist. marked T 8 N R 1 E S 31 B T .

A spruce 4 ins. diam. bears S. 60° W. 5 lks. dist. marked T 8 N R 1 W S 36 B T .

A spruce 10 ins. diam. bears N. 30° W. 9 lks. dist. marked T 8 N R 1 W S 25 B T .

Land level. Soil 1st rate.

Timber, spruce.

May 30: At this cor. I set off 21° 47' N. on the decl. arc. and at 11h 57m a.m. l.m.t. I observe the sun on the meridian, the resulting lat. is 62° 26' N.

North bet. Secs. 25 and 30.

Over level land, through spruce timber.

11.00 South edge of 10 acre lake, bears N. 50° E.

I set a flag on N. side of lake. I then establish a base line N. 47° 41' E. 5 chs. dist. from which point the flag bears N. 32° 48' W. I measure each angle and find them to be respectively 47° 41', 99° 31', and 32° 48', their sum being 180°, I calculate the dist. across the lake as follows:

$$\frac{\text{Sin } 80° \ 29'}{\text{Sin } 32° \ 48'} \text{ X base or } \frac{.9862 \text{ X } 5.00}{.5417} = 9.10 \text{ chs.}$$

also 11 chs. + 9.10 chs. =

20.10 Triangulation point on N. bank of lake, bears S. 30° E. Bank of lake 5 ft. high

~~33.00 Bears E. and W.~~

Chains. No difference in measurement between the two sets of chainmen.

40.00 Set a slatestone 16 X 8 X 5 ins. 12 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face, from which,

A spruce 8 ins. diam. bears N. 53° 30' E. 10 lks. dist. marked 1/4 S. 30 B T .

A spruce 8 ins. diam. bears N. 86° 30' W. 8 lks. dist. marked 1/4 S. 25 B T .

No difference in measurement between the two sets of chainmen.

80.00 Set a slatetsont 14 X 12 X 10 ins. 10 ins. in the ground for cor. of secs. 19, 24, 25, and 30, marked with 2 notches on S. and 4 notches on N. edges, from which,

A spruce 8 ins. diam. bears N. 17° 10' W. 44 lks. dist. marked T 8 N R 1 W S 24 B T .

A spruce 5 ins. diam. bears N. 51° E. 12 lks. dist. marked T 8 N R 1 E S 19 B T .

A spruce 5 ins. diam. bears S. 81° E. 10 lks. dist. marked T 8 N R 1 E S 30 B T .

A spruce 4 ins. diam. bears S. 45° W. 29 lks. dist. marked T 8 N R 1 W S 25 B T .

Land level. Soil 1st rate.

Timber, spruce. May 30, 1905.

North bet. secs. 19 and 24.

Over legel land through spruce timber.

30.00 Enter burned timber, course E. and W.

No difference in measurement between the two sets of chainmen.

40.00 Set a slatestone 14 X 6 X 6 ins. 10 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face, from which,

A spruce 8 ins. diam. bears N. 31° 50' W. 130 lks. dist. marked 1/4 S. 24 B T .

A spruce 4 ins. diam. bears N. 1° 08' E. 137 lks. dist. marked 1/4 S. 19 B T .

No difference in measurement between the two sets of chainmen.

Principal Meridian through T. 8 N. bet. Rs. 1 E. and 1 W.

Chains.

80.00 Set a slatestone 16 X 9 X 5 ins. 12 ins. in the ground for cor. of secs. 13, 18, 19 and 24, marked with 3 notches on N. and S. edges, from which,

A spruce 4 ins. diam. bears N. 17° W. 10 lks. dist. marked T 8 N R 1 W S 13 B T .

A spruce 5 ins. diam. bears S. 64° 40' W. 28 lks. dist. marked T 8 N R 1 W S 24 B T .

A spruce 4 ins. diam. bears N. 84° 50' E. 16 lks. dist. marked T 8 N R 1 E S 18 B T .

A spruce 4 ins. diam. bears S. 56° 20' E. 10 lks. dist. marked T 8 N R 1 E S 19 B T .

Land level. Soil 1st rate.

Timber, spruce.

May 31: At this cor. I set off 21° 56' N. on the decl. arc. and at 11h 57m a.m. l.m.t. observe the sun on the meridian, the resulting lat. is 62° 27' N.

North bet. secs. 13 and 18.

Over level land, enter spruce timber.

10.00 Enter meadow, bears N.E. and S.W.

No difference in measurement between the two sets of chainmen.

40.00 Set a slatestone 14 X 11 X 9 ins. 10 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face, from which,

A spruce 10 ins. diam. bears S. 10° 15' W. 349 lks. dist. marked 1/4 S. 13 B T .

A spruce 7 ins. diam. bears N. 3° 36' W. 362 lks. dist. marked 1/4 S. 13 B T .

50.00 Leave meadow, enter thick spruce timber, bears N. E. and S. W.

70.00 An old trail blazed N. W. and S. E.

No difference in measurement between the two sets of chainmen.

80.00 Set a slatestone 15 X 8 X 6 ins. 10 ins. in the ground for cor. of secs. 7, 12, 13 and 18, marked with 4 notches on S. and 2 notches on N. edges, from which,

A spruce 4 ins. diam. bears N. 7° E. 11 lks. dist. marked T 8 N R 1 E S 7 B T .

Chains A spruce 4 ins. diam. bears N. 40° 45' W. 36 lks. dist. marked T 8 N R 1 W S 12 B T .

A spruce 4 ins. diam. bears S. 68° 45' W. 31 lks. dist. marked T 8 N R 1 W S 13 B T .

A spruce 14 ins. diam. bears S. 9° 30' E. 11 lks. dist. marked T 8 N R 1 E S 18 B T .

Land level. Soil 1st rate.

Timber, small spruce.

Polaris not being visible at this season of the year, in order to test the solar apparatus by comparing results of observations on the sun made during a.m. and p.m. hours with the true meridian determined by the direct observations made on the sun, I proceed as follows:

I set my instrument over the corner of secs. 7, 12, 13 and 18, last described .

May 31: At about 3h p.m. l.m.t. I make a direct observation on the sun, theobserved altitude of the sun's lower limb is 36° 11' + 16' for semi-dia. = 36° 27' - 01' for refraction = 36° 26', true alt. of the sun's center. I calculate the azimuth by the following formula

$$\text{Cos. } 1/2 \text{ Az.} = \sqrt{\frac{\text{Cos. S. Cos. (S-P D)}}{\text{Cos. L. Cos. h.}}}$$

P. D.	68° 04'		
Lat	62° 28'	A. C. Log Cos	0.33510
Alt	36° 26'	" " " "	0.09444
2 S =2)	166° 58'		
S. =	83° 29'	Log Cos.	9.05497
S - P D=	15° 25'	" "	9.98409
Square Root			2)19.46860
Gives Log Cos 1/2 Az.		(57° 09')	9.73430
Az.		114° 18'	

I turn an angle of 114° 18' toward the North and mark the meridian thus determined upon a peg driven in the ground.

I then set off 62° 28' N. on the lat. arc. 21° 57' N. on the decl. arc. and determine the meridian with the solar which falls on the North line determined by direct observation. May 31, 1905.

Chains June 1, 1905. At 8h a.m. l.m.t. I set off 62° 28' N. on the lat. arc. 22° 03' N. on the decl. arc. and determine the meridian which coincides with those marked yesterday, therefore I conclude the adjustments of the instrument are satisfactory.

N. bet. secs. 7 and 12

Over level land through thick spruce.-

10.00 Enter wet meadow, bears N. E. and S. W.

No difference in measurement between the two sets of chainmen.

40.00 Set a granitestone 14 X 12 X 10 ins. 10 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face ; dig pits 18 X 18 X 12 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.

Over wet meadow land

60.00 Enter timber, bears N. E. and S. W.

No difference in measurement between the two sets of chainmen.

80.00 Set a slatestone 15 X 10 X 6 ins. 10 ins. in the ground for cor of secs. 1, 6, 7 and 12, marked with 5 notches on S. and 1 notch on N. edges, from which,

A spruce 10 ins. diam. bears N. 71° 30' E. 110 lks. dist. marked T 8 N R 1 E S 6 B T .

Chains. A spruce 16 ins. diam. bears S. 39° 50' E. 30 lks. dist. marked T 8 N R 1 E S 7 B T .

A spruce 4 ins. diam. bears N. 57° 50' W. 52 lks. dist. marked T 8 N R 1 W S 1 B T .

A spruce 16 ins. diam. bears S. 12° 45' W. 46 lks. dist. marked T 8 N R 1 W S 12 B T .

Land level . Soil 1st rate.

Timber, spruce.

June 1; At 10h a.m. l.m.t. I set off 62° 29' N. on the lat. arc. 22° 04' N. on the decl. and determine the meridian with the solar at the cor. of secs. 1, 6, 7 and 12.

North bet. secs. 1 and 6.

Over level land, through spruce timber.

7.50 East shore of 4 acre lake, bears S. W. and N.

9.50 Leave shore of lake, enter timber, bears N. W. and S.

20.50 South shore of 5 acre lake, bears E. and W.

Note: I provide myself with steel tape 10 chs. long for measuring across small ponds, lakes and gulches.

24.00 North shore of lake, enter timber, bears E. and W.

No difference in measurement between the two sets of chainmen.

40.00 Set a slatestone 14 X 8 X 5 ins. 10 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face, from which,

A spruce 4 ins. diam. bears S. 15° E. 114 lks. dist. marked 1/4 S. 6 B T .

A spruce 4 ins. diam. bears S. 55° W. 85 lks. dist. marked 1/4 S. 1 B T .

No difference in measurement between the two sets of chainmen.

80.00 Set a slatestone 15 X 9 X 9 ins. 10 ins. in the ground for cor. of Tps. 8 and 9 N. Rs. 1 E. and 1 W., marked T 9 N on N. E., R 1 E on S. E., T 8 N on S. W. and R 1 W on N. W., faces with 6 notches on each edge, from which,

A spruce 4 ins. diam. bears N. 67° 30' W. 47 lks. dist. marked T 9 N R 1 W S 36 B T .

Principal Meridian through T 9 N bet. Rs. 1 E. and 1 W.

Chains. A sprude 5 ins. diam. bears N. 51° E. 15 lks. dist. marked T 9 N R 1 E S 31 B T .

A spruce 5 ins. diam. bears S. 81° E. 15 lks. dist. marked T 8 N R 1 E S 6 B T .

A spruce 4 ins. diam. bears S. 25° 30' W. 17 lks. dist. marked T 8 N R 1 W S 1 B T .

Land level Soil 1st rate.

Timber, spruce.

June 1: At this cor. I set of 22° 04' N. on the decl. arc. and at 11h 58m a.m. l.m.t. observe the sun on the meridian, the resulting lat. is 62° 30' N.

North bet. secs. 31 and 36.

Over level land through spruce timber.

No difference in measurement between the two sets of chainmen.

40.00 Set a greenstone 15 X 7 X 5 ins. 10 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face, from which,

A spruce 5 ins. diam. bears S. 75° 45' W. 20 lks. dist. marked 1/4 S. 36 B T .

A spruce 8 ins. diam. bears S. 40° 40' E. 11 lks. dist. marked 1/4 S. 31 B T .

No difference in measurement between the two sets of chainmen.

80.00 Set a greenstone 16 X 7 X 5 ins. 12 ins. in the ground for cor. of secs. 25, 30, 31 and 36, marked with 1 notch on S. and 5 notches on N. edges, from which,

A spruce 6 ins. diam. bears N. 49° 49' E. 22 lks. dist. marked T 9 N R 1 E S 30 B T .

A spruce 6 ins. diam. bears N. 22° 40' W. 14 lks. dist. marked T 9 N R 1 W S 25 B T .

A spruce 6 ins. diam. bears S. 68° 30' E. 9 lks. dist. marked T 9 N R 1 E S 31 B T .

A spruce 4 ins. diam. bears S. 18° W. 12 lks. dist. marked T 9 N R 1 W S 36 B T .

Land level. Soil 1st rate.

Timber, spruce.

June 1, 1905.

Chains. North bet. secs. 25 and 30.

Over level land, through dense timber.

8.00 Enter meadow, bears E. and W.

10.00 Leave meadow, enter timber, bears E. and W.

No difference in measurement between the two sets of chainmen.

40.00 Set a greenstone 14 X 8 X 6 ins. 10 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face, from which,

An aspen 4 ins. diam. bears N. 13° 30' E. 26 lks. dist. marked 1/4 S. 30 B T .

A spruce 4 ins. diam. bears N. 40° W. 31 lks. dist. marked 1/4 S. 25 B T .

No difference in measurement between the two sets of chainmen.

80.00 Set a greenstone 15 X 12 X 8 ins. 10 ins. in the ground for cor. secs. 19, 24, 25 and 30, marked with 2 notches on S. and 4 notches on N. edges, from which

A spruce 4 ins. diam. bears N. 33° E. 38 lks. dist. marked T 9 N R 1 E S 19 B T .

A spruce 4 ins. diam. bears S. 9° 30' E. 26 lks. dist. marked T 9 N R 1 E S 30 B T .

A spruce 4 ins. diam. bears S. 62° 50' W. 46 lks. dist. marked T 9 N R 1 W S 25 B T .

A spruce 4 ins. diam. bears N. 33° W. 64 lks. dist. marked T 9 N R 1 W S 24 B T .

Land level. Soil 1st rate.

Timber , small dense spruce.

North bet. secs. 19 and 24.

Over land slightly rolling, through thick spruce timber.

10.00 Southeast edge 4 acre lake, bears S. W. and N.W.

38.00 East edge of 2 acre lake, bears S. W. and N. W.

No difference in measurement between the two sets of chainmen.

40.00 Set a greenstone 14 X 7 X 6 ins. 10 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face, from which,

Principal Meridian through T. 9 N. bet. Rs. 1 E. and 1 W.

Chains. A spruce 5 ins. diam. bears S. 45° 30' W. 24 lks. dist. marked 1/4 S 24 B T .

A spruce 4 ins. diam. bears N. 38° 20' E. 53 lks. dist. marked 1/4 S. 19 B T .

49.00 South shore of 4 acre pond, bears E. and W.

52.00 North shore of same pond, bears E. and W.

65.00 Southeast shore of lake. Along edge of lake .

72.00 Leave shore of lake, bears . W. and S.

No differance in measurement between the two sets of chainmen.

80.00 The point for cor. of secs. 13, 18, 19 and 24, falls in slough which drains W. and the ground on S. side of cor. is not suitable for witness cor.

Land level and rolling . Soil 1st rate.

Timber, spruce and willow.

Northbet. secs. 13 and 18.

Over rolling land covered with ponds, sloughs and wet meadows.

1.00 Set a granite stone 16 X 12 X 6 ins. 12 ins. in the ground for witness corner to cor. of secs. 13, 18, 19 and 24, marked W C on N. E. face with 3 grooves on N. and S. edges, from which,

A spruce 4 ins. diam. bears N. 46° E. 5 lks. dist marked W C T 9 N R 1 E S 18 B T .

A spruce 4 ins. diam. bears S. 16° E. 23 lks. dist. marked W C T 9 N R 1 E S 19 B T .

A spruce 5 ins. diam. bears S. 9° W. 30 lks. dist. marked W C T 9 N R 1 W S 24 B T .

A spruce 5 ins. diam. bears N. 56° W. 16 lks. dist. marked W C T 9 N R 1 W S 13 B T .

13.00 South bank of 40acre lake. Bears E. and W.

Set a lavastone 18 X 10 X 6 ins. 12 ins. in the ground for meander cor. for fracl. secs. 13 and 18,

See corrected notes page 83

~~marked M C on N. face, from which~~,

A spruce 8 ins. diam. bears S. 5° E. 34 lks. dist. marked M C T 9 N R 1 E S 18 B T .

A birch 10 ins. diam. bears S. 77° W. 31 lks. dist. marked M C T 9 N R 1 W S 13 B T .

In order to determine the dist. across the lake,

Chains I set a point on the N. bank of the lake. From this point I measure a base S. 68° 18' W. 10 chs. to a point from which the triangulation point on S. bank of lake bears S. 20° 18' E. I measure each angle separately and determine them to be respectively 68° 18' , 20° 18' and 91° 24', their sum being 180° I calculate the dist. across the lake as follows:

$$\frac{\text{Sin } 91° \ 24'}{\text{Sin } 20° \ 18'} \text{ X base or } \frac{.9997 \text{ X } 10.00}{.3469} = 28.82 \text{ chs.}$$

also 13.00 chs. + 28.82 chs. = 41.82 chs.

No difference in measurement between the two sets of chainmen.

40.00 The 1/4 sec. cor. falls in lake.

41.00 North shore of lake, bears S. 70° W. and E.

41.82 Triangulation point on N. bank of lake.

42.00 Set a slatestone 15 X 10 X 10 ins. 10 ins in the ground for meander cor. for fracl secs. 13 and 18, see corrected notes, page 83 ~~marked M C on S. face, from which,~~

A spruce 5 ins. diam. bears N. 46° 40' E . 52 lks. dist. marked M C T 9 N R 1 E S 18 B T .

A spruce 4 ins. diam. bears N. 40° 50' W. 45 lks. dist. marked M C T 9 N R 1 W S 13 B T .

No difference in measurement between the two sets of chainmen.

80.00 Set a lavastone 13 X 7 X 7 ins. 9 ins. in the ground for cor. of secs. 7, 12, 13, and 18, marked with 4 notches on S. and 2 notches on N. edges, from which,

A spruce 5 ins. diam. bears N. 84° 45' E. 25 lks. dist. marked T 9 N R 1 E S 7 B T .

A spruce 6 ins. diam. bears S. 37° 30' E. 32 lks. dist. marked T 9 N R 1 E S 18 B T .

A spruce 5 ins. diam. bears S. 61° 40' W. 56 lks. dist. marked T 9 N R 1 W S 13 B T .

A spruce 5 ins. diam. bears N. 69° 45' W. 43 lks. dist. marked T 9 N R 1 W S 12 B T .

Land level and rolling. Soil 1st rate.

Timber, spruce.

June 1, 1905.

Note: Clouds prevented observation on sun, June 1.

Chains. June 3: At 7h a.m. l.m.t. I set off 62° 34' N. on the lat. arc. 22° 19' N. on the decl. arc. and determine the meridian with the solar at the cor. of secs. 7, 12, 13 and 18.

The mag. variation is 32° E.

North bet. secs. 7 and 12.

Over level land, through spruce timber.

No difference in measurement between the two sets of chainmen.

40.00 Set a granitestone 16 X 14 X 7 ins. 12 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face from which,

A spruce 5 ins. diam. bears N. 45° E. 5 lks. dist. marked 1/4 S. 7 B T .

A spruce 5 ins. diam. bears S. 89° W. 9 lks. dist. marked 1/4 S. 12 B T .

No difference in measurement between the two sets of chainmen.

80.00 Set a greenstone 16 X 8 X 6 ins. 12 ins. in the ground for cor. of secs. 1, 6, 7 and 12, marked with 5 notches on the S. and 1 notch on the N. edges, from which,

A spruce 6 ins. diam. bears N. 19° E. 30 lks. dist. marked T 9 N R 1 E S 6 B T .

A spruce 5 ins. diam. bears S. 86° E. 40 lks. dist. marked T 9 N R 1 E S 7 B T .

A spruce 4 ins. diam. bears S. 14° 30' W. 31 lks. dist. marked T 9 N R 1 W S 12 B T .

A spruce 5 ins. diam. bears N. 39° 30' W. 45 lks. dist. marked T 9 N R 1 W S 1 B T .

Land level . Soil 1st rate.

Timber, spruce.

North bet. secs. 1 and 6.

Over level land, through spruce.

4.65 South bank of lake bears N. 55° W. and S. 55° E.

Set a granitestone 18 X 8 X 6 ins. 12 ins. in the ground for meander cor. for fracl. secs. 1 and 6, ~~marked M C on N. face, from which,~~

see corrected notes page 83

A spruce 6 ins. diam. bears S. 50° W. 19 lks. dist. marked M C T 9 N R 1 W S 1 B T .

Chains. A spruce 6 ins. diam. bears S. 60° E. 13 lks, dist. marked M C T 9 N R 1 E S 6 B T .

In order to determine the dist. across the lake, I proceed as follows: I set a flag on N. side of lake on line, then measure a base N. 55° 11' W. 9 chs. dist. to a point from which the flag bears N. 18° 51' E. I cannot get a longer base on account of the character of the shore line being swampy. I measure each angle carefully , and the angles are respectively 55° 11', 18° 51' and 105° 58' their sum being 180°. I compute the dist. across the lake as follows: $\frac{\text{Sin } 105° 58'}{\text{Sin } 18° 51'}$ X base or $\frac{.9614 \text{ X } 9.00}{.323}$ = 26.78 chs. and 4.65 chs. + 26.78 chs. = 31.43 chs.

31.43 North bank of lake, bears E. and W.

Set a granitestone 15 X 14 X 8 ins. 10 ins. in the ground for meander cor. for fracl. secs. 1 and 6, See corrected notes page 84 ~~marked M C on S. face from which~~,

A spruce 4 ins. diam. bears N. 45° E. 6 lks. dist. marked M C T 9 N R 1 E S 6 B T .

A spruce 5 ins. diam. bears S. 30° W. 6 lks. dist. marked M C T 9 N R 1 W S 1 B T .

Over level land, through timber.

No difference in measurement between the two sets of chainmen.

40.00 Set a granitestone 15 X 7 X 6 ins. 10 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face, from which,

A spruce 6 ins. diam. bears N. 11° W. 62 lks. dist. marked 1/4 S. 1 B T .

A spruce 4 ins. diam. bears S. 61° 45' E. 35 lks. dist. marked 1/4 S. 6 B T .

June 3: I set off 22° 20' N. on the decl. arc. and at 11h 58m a.m. l.m.t. observe the sun on the meridian, the resulting lat. is 62° 35' N.

No difference in measurement between the two sets of chainmen.

80.00 Set a granitestone 14 X 10 X 7 ins. 10 ins. in the ground for cor. of Tps. 9 and 10 N. Rs. 1 E. and 1 W. marked T 10 N on N. E., R 1 E on S. E., T 9 N on S. W., and R 1 W on N. W., with 6 notches on each edge, from which,

 Principal Meridian through T. 10 N. bet. Rs. 1 E. and 1 W.

Chains. A spruce 4 ins. diam. bears N. 21° E. 18 lks. dist. marked T 10 N R 1 E S 31 B T .

A spruce 5 ins. diam. bears S. 29° 30' E 51 lks. dist. marked T 9 N R 1 E S 6 B T .

A spruce 5 ins. diam. bears S. 43° W. 36 lks. dist. marked T 9 N R 1 W S 1 B T .

A spruce 5 ins. diam. bears N. 62° 40' W. 25 lks. dist. marked T 10 N R 1 W S 36 B T .

Land level. Soil 1st rate.

Timber, spruce.

North bet. secs. 31 and 36.

Over level land, through timber.

34.45 South edge of pond, bears E. and W.

No difference in measurement between the two sets of chainmen.

40.00 The 1/4 sec. cor. point falls in pond.

43.00 North bank of pond, bears E. and W.

Set a granitestone 14 X 6 X 6 ins. 10 ins. in the ground for witness cor. to the 1/4 sec. cor. marked W C 1/4 on W. face from which,

A spruce 6 ins. diam. bears N. 57° W. 59 lks. dist. marked W C 1/4 S. 36 B T .

A spruce 5 ins. diam. bears N. 14° E. 64 lks. dist. marked W C 1/4 S 31 B T .

73.66 South bank of 40 acre lake, bears N. Easterly.

Set a granitestone 14 X 7 X 6 ins. 10 ins. in the ground for meander cor. for fracl. secs. 31 and 36, see corrected notes page 84 ~~marked M C on N. face, from which,~~

A spruce 6 ins. diam. bears N. 85° E. 85 lks. dist. marked M C T 10 N R 1 E S 31 B T .

A spruce 5 ins. diam. bears N. 35° W. 14 lks. dist. marked M C T 10 N R 1 W S 36 B T .

No difference in measurement between the two sets of chainmen.

80.00 The point for cor. of secs. 25, 30, 31 and 36 falls in lake.

Land level. Soil 1st rate.

Timber, spruce.

June 3, 1905.

Principal Meridian through T. 10 N. bet. Rs. 1 E. and 1 W.

Chains. North bet. secs. 25 and 30.

In order to determine the dist. across the lake, I proceed as follows: I set a flag on line on N. shore of lake, then measure a base N. 56° 43' E. 10 chs. to a point from which the flag bears N. 38° 01' W. I measure the angles separately and find them to be respectively 56° 43' , 38° 01' and 85° 16', their sum being 180°. I calculate the dist. across the lake as follows:

$\frac{\text{Sin } 85° 16'}{\text{Sin } 38° 01'}$ X base or $\frac{.9966 \text{ X } 10.00}{.6159}$ = 16.18 chs.

and 73.66 chs. + 16.18 chs. = 89.84 chs. or 9.84 chs. N. of cor.

9.84 North shore of lake, bears N. Westerly.

Set a granite stone 15 X 8 X 6 ins. 10 ins. in the ground for meander cor. of fracl. secs. 25 and 30

see corrected notes page 84

~~marked M C on S. face, from which,~~

A spruce 12 ins. diam. bears S. 10° W. 15 lks. dist. marked M C T 10 N R 1 W S 25 B T .

A spruce 4 ins. diam. bears N. 85° E. 45 lks. dist. marked M C T 10 N R 1 E S 30 B T .

32.00 East edge of 4 acre lake, bears S. W. and N. W.

No difference in measurement between the two sets of chainmen.

40.00 Set a granitestone 18 X 8 X 8 ins. 12 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face, from which,

A spruce 5 ins. diam. bears N. 2° E. 80 lks. dist. marked 1/4 S 30 B T .

A spruce 5 ins. diam. bears N. 46° 30' W. 35 lks. dist. marked 1/4 S 25 B T .

June 5: At 10h a.m. l.m.t. I set off 62° 36' N. on the lat. arc. 22° 34' N. on the decl. arc. and determine the meridian with the solar.

76.25 South shore of large lake, bears N. 40° W. and S. 40° E.

Set a lavastone 14 X 8 X 7 ins. 10 ins. in the ground for meander cor. of fracl. secs. 25 and 30

see corrected notes page 84

~~marked M C on N. face, from which,~~

A spruce 5 ins. diam. bears N. 12° 15' E. 21 lks. dist. marked M C T 10 N R 1 E S 30 B T .

A spruce 4 ins. diam. bears N. 71° 20' E. 18 lks.

Chains. dist. marked M C T 10 N R 1 E S 30 B T .

A spruce 4 ins. diam. bears N. 26° W. 37 lks. dist. marked M C T 10 N R 1 W S 25 B T .

A spruce 4 ins. diam. bears N. 64° W. 58 lks. dist. marked M C T 10 N R 1 W S 25 B T .

No difference in measurement between the two sets of chainmen.

80.00 The point for cor. of secs. 19, 24, 25 and 30, falls in lake.

Land level. Soil 1st rate.

Timber, spruce.

North bet. secs. 19 and 24.

Over lake.

To determine the dist. across the lake, I proceed as follows: from the meander cor. on S. shore of lake I set a flag on line on N. shore. I then lay off base N. 41° 42' W. 19 chs. to a point from which, the flag bears N. 33° 22' E. I measure each angle separately and find them to be respectively 41° 42', 33° 22' and 104° 56', their sum being 180°. I calculate the dist. as follows: $\frac{\text{Sin } 104° 56'}{\text{Sin } 33° 22'}$ X base or $\frac{.9662 \times 19.00}{.55}$ = 33.38 chs. Also 76.25 chs. + 33.38 chs. = 109.63 chs. - 80 chs. gives

29.63 Triangulation point on N. shore of lake, bears E. and W.

Set a granitestone 15 X 10 X 9 ins. 10 ins. in the ground for Meander cor. of fracl. secs. 19 and 24
See corrected notes page 84
~~marked M C on S. face from which,~~

A spruce 4 ins. diam. bears S. 54° E. 15 lks. dist. marked M C T 10 N R 1 E S 19 B T .

A spruce 6 ins. diam. bears S. 70° W. 10 lks. dist. marked M C T 10 N R 1 W S 24 B T .

38.05 South shore of 100 acre lake, bears N. 35° E. and S. 35° W.

Set a lavastone 14 X 6 X 6 ins. 10 ins. in the ground for meander cor. for fracl. secs. 19 and 24
See corrected notes page 84
~~marked M C on N. face, from which,~~

A spruce 9 ins. diam. bears S. 34° E. 24 lks. dist. marked M C T 10 N R 1 E S 19 B T .

A spruce 4 ins. diam. bears S. 25° W. 25 lks.

Chains. dist. marked M C T 10 N R 1 W S 24 B T .

No difference in measurement between the two sets of chainmen.

40.00 The point for 1/4 sec. cor. falls in lake. I determine the dist. across the lake as follows: from my station on South shore of lake, I set a flag on line on the N. shore then measure a base N. 37° 45' E. 8 chs. to a point from which the flag bears ~~S.~~ N 21° 39' ~~W~~ E. I can not measure a longer base on account of the swampy nature of the land. I measure each angle separately and the resulting angles are respectively 37° 45', 21° 39' and 120° 36' their sum being 180°. I calculate the dist. as follows: $\frac{\text{Sin } 120° \ 36'}{\text{Sin } 21° \ 39'}$ X base or $\frac{.8607 \text{ X } 8.00}{.3689}$ = 18.66 chs. Also 38.05 chs. + 18.66 chs. =

56.71 Triangulation point on N. shore of lake, bears E. and W.

Set a lavastone 14 X 10 X 7 ins. 10 ins. in the ground for meander cor. for fracl. secs. 19 and 24

See corrected notes page 84

~~marked M C on S. face, from which,~~

A spruce 4 ins. diam. bears S. 42° W. 29 lks. dist. marked M C T 10 N R 1 W S 24 B T .

A spruce 4 ins. diam. bears N. 86° E. 30 lks. dist. marked M C T 10 N R 1 E S 19 B T .

73.00 Enter swampy meadow, bears E. and W.

No difference in measurement between the two sets of chainmen.

80.00 The point for cor. of secs. 13, 18, 19 and 24 falls in shallow pond and cannot be set.

Land level and covered with many wet meadows, ponds and lakes.

Soil 1st rate. Timber, spruce.

North bet. secs. 13 and 18.

I measure the dist. across pond with long steel tape.

1.00 North side swampy meadow, bears E. and W.

Set a lavastone 14 X 12 X 9 ins. 10 ins. in the ground for witness cor. to cor. of secs. 13, 18, 19 and 24, marked W C on N. E. face with 3 notches on N. and S. edges, from which,

Principal Meridian through T. 10 N. bet. Rs. 1 E. and 1 W.

Chains A spruce 5 ins. diam. bears N. 82° E. 26 lks. dist. marked W C T 10 N R 1 E S 18 B T .

A spruce 6 ins. diam. bears S 55° 30' E. 24 lks. dist. marked W C T 10 N R 1 E S 19 B T .

A spruce 4 ins. diam. bears S. 15° W. 32 lks. dist. marked, W C T 10 N R 1 W S 24 B T .

A spruce 5 ins. diam. bears N. 17° 20' W. 42 lks. dist. marked W C T 10 N R 1 W S 13 B T .

June 5: At the last described Witness cor. I set off 22° 34' N. on the decl. arc. and at 11h 59m a.m. l.m.t. observe the sun on the meridian, the resulting lat. is 63° 38' N.

Over level land.

No difference in measurement between the two sets of chainmen.

40.00 Set a lavastone 16 X 12 X 10 ins. 11 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face, from which,

A spruce 6 ins. diam. bears N. 78° E. 22 lks. dist. marked 1/4 S. 18 B T .

A spruce 5ins. diam. bears N. 67° 15' W. 23 lks. dist. marked 1/4 S 13 B T .

60.00 Enter scattering dead timber, bears E. and W.

No difference in measurement between the two sets of chainmen.

80.00 Set a granitestone 16 X 14 X 11 ins. 11 ins. in the ground for cor. of secs. 7, 12, 13 and 18, marked with 4 notches on S. and 2 notches on N. edges, from which,

A spruce 10 ins. diam. bears N. 56° 40' E. 101 lks. dist. marked T 10 N R 1 E S 7 B T .

See corrected notes page 84

A spruce 4 ins. diam. bears S. 63° 45' W. 82 lks. dist. marked T 10 N R 1 W S 13 B T .

A spruce 8 ins. diam. bears N. 89° 40' E 110 lks. dist. marked T 10 N R 1 E S 7 B T .

A spruce 6 ins. diam. bears N. 86° W. 63 lks. dist. marked T 10 N R 1 W S 12 B T .

Land level and slightly rolling.

Soil 1st rate. Timber, spruce.

June 5, 1905.

Chains. North bet. secs. 7 and 12.

Over level land, through spruce timber.

24.60 Center of Clear Water Creek, 30 lks. wide, 3 ft. deep, flowing E. Banks of creek 6 ft. high.

32.00 Line crosses same creek and follows left bank of creek.

35.00 Line crosses same creek, creek flows E. asc. to top of bank.

Over level land.

No difference in measurement between the two sets of chainmen.

40.00 Set a granitestone 15 X 14 X 4 ins. 10 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face, from which,

A spruce 10 ins. diam. bears N. 73° 20' W. 36 lks. dist. marked 1/4 S 12 B T .

A spruce 10 ins. diam. bears East 16 lks. dist. marked 1/4 S 7 B T .

June 6: At 9h a.m. l.m.t. I set off 62° 39' N. on the lat. arc. 22° 40' N. on the decl. arc. and determine the meridian with the solar.

50.00 Enter burned timber, bears E. and W.

60.00 Enter scattering green timber, bears E. and W.

No difference in measurement between the two sets of chainmen.

80.00 Set a lavastone 18 X 8 X 6 ins. 12 ins. in the ground for cor. of secs. 1, 6, 7 and 12, marked with 5 notches on S. and 1 notch on N. edges, from which,

see corrected notes page 85

A spruce 8 ins. diam. bears N. 53° 30' E 34 lks. dist. marked T 10 N R 1 E S 6 B T .

A spruce 8 ins. diam. bears N. 86° 35' W. 44 lks. dist. marked T 10 N R 1 W S 1 B T .

A spruce 5 ins. diam. bears N. 30° 15' W. 22 lks. dist. marked T 10 N R 1 W S 1 B T .

A spruce 4 ins. diam. bears N. 23° 20' W. 41 lks. dist. marked T 10 N R 1 W S 1 B T .

Land level, but containing many low wet sloughs. Soil 1st rate. Timber, spruce.

Chains North bet. secs. 1 and 6.

Over rolling land, through scattering timber.

6.00 Enter meadow, bears N. 70° W.

24.00 Leave meadow, enter timber, bears E. and W.

No difference in measurement between the two sets of chainmen.

40.00 Set a lavastone 14 X 12 X 4 ins. 10 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face from which,

A spruce 6 ins. diam. bears N. 41° E. 22 lks. dist. marked 1/4 S. 6 B T .

A spruce 10 ins. diam. bears N. 6° 30' W. 65 lks. dist. marked 1/4 S. 1 B T .

No difference in measurement between the two sets of chainmen.

80.00 Set a sandstone 14 X 8 X 6 ins. 10 ins. in the ground for cor. of Tps. 10 and 11 N. Rs. 1E. and 1 W. marked T 11 N. on N. E., R 1 E on S. E., T 10 N on S. W., and R 1 W on N. W., faces, with 6 notches on each edge, from which,

A spruce 5 ins. diam. bears N. 22° E. 10 lks. dist. marked T 11 N R 1 E S 31 B T .

A spruce 4 ins. diam. bears S. 68° E. 11 lks. dist. marked T 10 N R 1 E S 6 B T .

A spruce 6 ins. diam. bears S. 75° W. 15 lks. dist. marked T 10 N R 1 W S 1 B T .

A spruce 5 ins. diam. bears N. 62° W. 29 lks. dist. marked T 11 N R 1 W S 36 B T .

Land level and rolling.

Soil 1st rate.

Timber, spruce.

June 6: I set off 22° 40' N. on the decl. arc. and at 11h 58m a.m. l.m.t. observe the sun on the meridian, the resulting lat. is 62° 41' N.

North bet. secs. 31 and 36.

Over level land, through spruce timber.

No difference in measurement between the two sets of chainmen .

40.00 Set a lavastone 14 X 8 X 5 ins. 10 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face, from

Chains which,

A spruce 4 ins. diam. bears N. 39° 40' E. 24 lks. dist. marked 1/4 S 31 B T .

A spruce 5 ins. diam. bears N. 82° W 14 lks. dist. marked 1/4 S 36 B T .

No difference in measurement between the two sets of chainmen.

80.00 Set a lavastone 13 X 8 X 7 ins. 9 ins. in the ground for cor. of secs. 25, 30, 31 and 36, marked with 1 notch on S. and 5 notches on N. edges, from which,

A spruce 4 ins. diam. bears N. 8° 30' E. 20 lks. dist. marked T 11 N R 1 E S 30 B T .

A spruce 4 ins. diam. bears S. 55° E. 22 lks. dist. marked T 11 N R 1 E S 31 B T .

A spruce 4 ins. diam. bears S. 67° 30' W. 31 lks. dist. marked T 11 N R 1 W S 36 B T .

A spruce 5 ins. diam. bears N. 77° 40' W. 32 lks. dist. marked T 11 N R 1 W S 25 B T .

Land level. Soil 1st rate.

Timber, spruce.

June 6, 1905.

North bet. secs. 25 and 30.

Over level land through spruce timber.

No difference in measurement between the two sets of chainmen.

40.00 Set a lavastone 16 X 12 X 9 ins. 11 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face, from which,

A spruce 8 ins. diam. bears N. 66° 45' E. 52 lks. dist. marked 1/4 S 30 B T .

A spruce 8 ins. diam. bears N. 15° 30' W. 41 lks. dist. marked 1/4 S 25 B T .

No difference in measurement between the two sets of chainmen.

80.00 Set a lavastone 16 X 8 X 6 ins. 11 ins. in the ground for cor. of secs. 19, 24, 25 and 30 marked with 2 notches on S. and 4 notches on N. edges, from which,

Chains. A spruce 5 ins. diam. bears N. 31° 40' E. 38 lks. dist. marked T 11 N R 1 E S 19 B T .

A spruce 5 ins. diam. bears S. 24° 15' E. 36 lks. dist. marked T 11 N R 1 E S 30 B T .

A spruce 4 ins. diam. bears S. 37° 20' W. 12 lks. dist. marked T 11 N R 1 W S 25 B T .

A spruce 6 ins. diam. bears N. 61° W. 22 lks. dist. marked T 11 N R 1 W S 24 B T .

Land level. Soil 1st rate.

Timber, spruce.

June 7: I set off 62° 42' N. on the lat. arc. 22° 46' N. on the decl. arc. and determine the meridian at 10h a.m. l.m.t.

North bet. secs. 19 and 24.

Over level land, through spruce timber.

No difference in measurement between the two sets of chainmen.

40.00 Set a lavastone 14 X 12 X 5 ins. 10 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face from which,

A spruce 6 ins. diam. bears S. 40° E. 15 lks. dist. marked 1/4 S 19 B T .

A spruce 5 ins. diam. bears N. 21° 30' W. 15 lks. dist. marked 1/4 S 24 B T .

No difference in measurement between the two sets of chainmen.

80.00 Set a greenstone 14 X 7 X 6 ins. 10 ins. in the ground for cor. of secs. 13, 18, 19 and 24, marked with 3 notches on N. and S. edges, from which,

A spruce 6 ins. diam. bears N. 32° E. 28 lks. dist. marked T 11 N R 1 E S 18 B T .

A spruce 5 ins. diam. bears S. 10° 30' E. 50 lks. dist. marked T 11 N R 1 E S 19 B T .

A spruce 6 ins. diam. bears S. 30° 10' W. 41 lks. dist. marked T 11 N R 1 W S 24 B T .

A spruce 4 ins. diam. bears N. 19° W. 41 lks. dist. marked T 11 N R 1 W S 13 B T .

Land level. Soil 1st rate.

Timber, spruce.

Principal Meridian through T. 11 N. bet. Rs. 1 E. and 1 W.

Chains. June 7: I set off 22° 46' N. on the decl. arc. and at 11h 58m a.m. l.m.t. observe the sun on the meridian, the resulting lat. is 62° 43' N.

North bet. secs. 13 and 18.

Over level land, through spruce timber.

No difference in measurement between the two sets of chainmen.

40.00 Set a greenstone 17 X 6 X 5 ins. 12 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face from which,

A spruce 6 ins. diam. bears N. 73° 30' W. 29 lks. dist. marked 1/4 S. 13 B T .

A spruce 5 ins. diam. bears N. 66° 15' E. 26 lks. dist. marked 1/4 S 18 B T .

No difference in measurement between the two sets of chainmen.

80.00 Set a lavastone 18 X 7 X 6 ins. 12 ins. in the ground for cor. of secs. 7, 12, 13 and 18 marked with 4 notches on S. and 2 notches on N. edges, from which,

A spruce 5 ins. diam. bears N. 38° 30' E. 26 lks. dist. marked T 11 N R 1 E S 7 B T .

A spruce 4 ins. diam. bears S. 6° 20' E. 23 lks. dist. marked T 11 N R 1 E S 18 B T .

A spruce 5 ins. diam. bears S. 61° 15' W. 27 lks. dist. marked T 11 N R 1W S 13 B T .

A spruce 4 ins. diam. bears N. 21° 30' W. 19 lks. dist. marked T 11 N R 1 W S 12 B T .

Land level and slightly asc. to the N.

Soil 1st rate. Timber, spruce.

North bet. secs. 7 and 12.

Over rolling land, through spruce timber.

8.00 Center of gully, drains Westerly.

No differance in measurement between the two sets of chainmen.

40.00 Set a lavastone 14 X 7 X 6 ins. 10 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face from which,

A spruce 4 ins. diam. bears S. 11° 30' W. 11 lks. dist. marked 1/4 S 12 B T .

Chains. A spruce 6 ins. diam. bears S. 27° E. 21 lks. dist. marked 1/4 S 7 B T .

Desc. abruptly into gulch, bears N. E. and S. W.

42.50 Bottom of gulch, Creek 15 lks. wide 2 ft. deep, flows S. 40° W. asc. abruptly.

47.00 Top of bluff, bears N. E. and S. W. over level land.

50.00 Desc. into gulch, bears S. 40° E. and N. 40° W.

52.50 Same creek as above, drains S. 70° E. asc.

55.00 Top of ascent, bears S. 70° E. over level land.

76.00 Small creek, 5 lks. wide, flows S. W.

No difference in measurement between the two sets of chainmen.

80.00 Set a slatestone 14 X 8 X 6 ins. 10 ins. in the ground for cor. of secs. 1, 6, 7 and 12, marked with 5 notches on S. and 1 notch on N. edged, from which,

A spruce 4 ins. diam. bears N. 77° E. 114 lks dist. marked T 11 N R 1 E S 6 B T .

A spruce 4 ins. diam. bears S. 23° E. 75 lks. dist. marked T 11 N R 1 E S 7 B T .

A spruce 4 ins. diam. bears S. 63° 15' W. 38 lks. dist. marked T 11 N R 1 W S 12 B T .

A spruce 4 ins. diam. bears N. 74° 15' W. 46 lks. dist. marked T 11 N R 1 W S 1 B T .

Land level and rolling. Soil 1st rate.

Timber, spruce. June 7, 1905.

North bet. secs. 1 and 6.

Over level land, through spruce timber.

10.00 Asc.

14.00 Top of ascent, bears E. and W. over level land.

No difference in measurement between the two sets of chainmen.

40.00 Set a lavastone 14 X 8 X 5 ins. 10 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face, from which,

A spruce 4 ins. diam. bears S. 5 ° E. 21 lks. dist. marked 1/4 S 6 B T .

A spruce 4 ins. diam. bears S. 23° W. 25 lks. dist. marked 1/4 S. 1 B T .

June 8: At this cor. I set off 62° 45' N. on the

Chains. lat. arc. 22° 51' N. on the decl. arc. and at 9h a.m. l.m.t. determine the meridian with the solar.

The mag. variation is 32° E.

No difference in measurement between the two sets of chainmen.

80.00 Set a lavastone 18 X 8 X 6 ins. 12 ins. in the ground for cor. of Tps. 11 and 12 N. Rs. 1 E. and 1 W. marked T 12 N on N. E., R 1 E on S. E., T 11 N on S. W., and R 1 W on N. W., faces, with 6 notches on each edge, from which,

A spruce 5 ins. diam. bears N. 12° 15' E. 28 lks. dist. marked T 12 N R 1 E S 31 B T .

A spruce 4 ins. diam. bears S. 66° 44' E. 33 lks. dist. marked T 11 N R 1 E S 6 B T .

A spruce 5 ins. diam. bears S. 43° W. 9 lks. dist. marked T 11 N R 1 W S 1 B T .

A spruce 5 ins. diam. bears N. 62° 40' W. 38 lks. dist. marked T 12 N R 1 W S 36 B T .

Land level and rolling. Soil 1st rate.

Timber, spruce.

North bet. secs. 31 and 36.

Over level land, through spruce timber.

6.00 Over swampy meadow, bears E. and W.

18.00 Leave meadow, enter timber, bears E. and W.

No difference in measurement between the two sets of chainmen.

40.00 Set a lavastone 16 X 12 X 9 ins. 11 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face, from which,

A spruce 4 ins. diam. bears S. 18° E. 20 lks. dist. marked 1/4 S. 31 B T .

A spruce 4 ins. diam. bears S. 7° W. 17 lks. dist. marked 1/4 S. 36 B T .

No difference in measurement between the two sets of chainmen.

80.00 Set a lavastone 18 X 16 X 12 ins. 12 ins. in the ground for cor. of secs. 25, 30, 31 and 36, marked with 1 notch on S. and 5 notches on N. edges, from which,

Principal Meridian through T. 12 N. bet. Rs. 1 E. and 1 W.

Chains. A spruce 7 ins. diam. bears N. 19° 30' E. 112 lks. dist. marked T 12 N R 1 E S 30 B T .

A spruce 20 ins. diam. bears S. 20° E. 79 lks. dist. marked T 12 N R 1 E S 31 B T .

A spruce 6 ins. diam. bears S. 31° 20' W. 116 lks. dist. marked T 12 N R 1 W S 36 B T .

A willow 4 ins. diam. bears N. 35° 15' W. 39 lks. dist. marked T 12 N R 1 W S 25 B T .

Land level. Soil 1st rate.

Timber, spruce.

June 8: At this cor. I set off 22° 52' N. on the decl. arc. and at 11h 59m a.m. l.m.t. observe the sum on the meridian, the resulting lat. is 62° 47' N.

North bet. secs. 25 and 30.

Over rolling land, through spruce timber.

28.00 Creek 8 lks. wide, flows W. asc. gradually.

No difference in measurement between the two sets of chainmen.

40.00 Set a lavastone 12 X 11 X 9 ins. 8 ins. in the ground for 1/ 4 sec. cor. marked 1/4 on W. face, from which,

A birch 12 ins. diam. bears S. 38° 30' W. 10 lks. dist. marked 1/4 S 25 B T .

A spruce 12 ins. diam. bears N. 56° 45' E. 31 lks. dist. marked 1/4 S. 30 B T .

Asc. slope of Roundtop Mtn. bears E. and W.

Through dense brush and timber.

65.00 Leave timber, course E. and W.

Difference between measurements of 80 chs. by two sets of chainmen is 4 lks: position of middle point

By 1st set 79.98 chs.

By 2nd set 80.02 chs. the mean of which is

80.00 Set a lavastone 12 X 10 X 8 ins. 8 ins. in the ground for cor. of secs. 19, 24, 25 and 30, marked with 2 notches on S. and 4 notches on N. edges, and raise a mound of stone 2 ft. base 1 1/2 ft. high W. of cor., pits impracticable.

Land level and mountainous.

Soil 1st to 4th rate.

Timber, spruce, alder, birch and dense undergrowth.

Principal Meridian through T. 12 N. bet. Rs. 1 E. and 1 W.

Chains. North bet. secs. 19 and 24.

Asc. over mountain.

15.22 Highest point on E. slope of mtn. about 15 chs. E. of peak. desc.

Difference in measurement of 40 chs. by two sets of chainmen is 2 lks: position of middle point

By 1st set 39.99 chs.

By 2nd set 40.01 chs. the mean of which is

40.00 Set a lavastone 14 X 12 X 5 ins. 10 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.

Through dense brush and scattering spruce timber.

Foot of mtn.

No difference in measurement between two sets of chainmen.

80.00 Set a lavastone 16 X 10 X 9 ins. 12 ins. in the ground for cor. of secs. 13, 18, 19 and 24, marked with 3 notches on N. and S. edges, from which,

A spruce 12 ins. diam. bears N. 87° W. 14 lks. dist. marked T 12 N R 1 W S 13 B T .

A spruce 4 ins. diam. bears S. 28° 30' W. 30 lks. dist. marked T 12 N R 1 W S 24 B T .

A spruce 10 ins. diam. bears S. 32° E. 29 lks. dist. marked T 12 N R 1 E S 19 B T .

A spruce 4 ins. diam. bears N. 49° E. 19 lks. dist. marked T 12 N R 1 E S 18 B T .

Land mountainous. Soil 4th rate.

Timber, spruce, alder and dense brush.

June 8, 1905.

North bet. secs. 13 and 18.

Over rolling land, through scattering spruce and dense brush.

16.00 Creek 5 lks. wide 1 1/2 ft. deep, flows East.

19.00 Creek 12 lks. wide 1 1/2 ft. deep, flows East.

No difference in measurement between the two sets of chainmen.

40.00 Set a lavastone 14 X 8 X 5 ins. 10 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face, from which,

Chains. A spruce 10 ins. diam. bears S. 37° 15' E. 16 lks. dist. marked 1/4 S 18 B T .

A spruce 14 ins. diam. bears S. 35° 30' W. 39 lks. dist. marked 1/4 S 13 B T .

Asc. gradually.

43.00 Top of ascent, bears N. W. and S. E.

Over rolling land.

No difference in measurement between the two sets of chainmen.

80.00 Set a lavastone 13 X 9 X 6 ins. 9 ins. in the ground for cor. of secs. 7, 12, 13 and 18, marked with 4 notches on S. and 2 notches on N. edges, from which,

A spruce 12 ins. diam. bears N. 15° 15' E. 20 lks. dist. marked T 12 N R 1 E S 7 B T .

A spruce 12 ins. diam. bears S. 15° 45' E. 71 lks. dist. marked T 12 N R 1 E S 18 B T .

A spruce 10 ins. diam. bears S. 77° 40' W. 27 lks. dist. marked T 12 N R 1 W S 13 B T .

A spruce 6 ins. diam. bears N. 33° 15' W. 80 lks. dist. marked T 12 N R 1 W S 12 B T .

Land level and rolling. Soil 1st to 4th rate.

Timber, spruce and dense underbrush.

June 9: At 10h a.m. l.m.t. I set off 62° 49' N. on the lat. arc. 22° 57' N. on the decl. arc. and determine the meridian with the solar.

Mag variation 31° 10' East.

North bet. secs. 7 and 12.

Over rolling land through scattering spruce and dense undergrowth.

No difference in measurement between the two sets of chainmen.

40.00 Set a granitestone 16 X 10 X 6 ins. 11 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face from which,

A spruce 6 ins. diam. bears N. 78° E. 34 lks. dist. marked 1/4 S 7 B T .

A spruce 6 ins. diam. bears S. 81° W. 77 lks. dist. marked 1/4 S 12 B T .

68.00 South edge of small lake, bears E. and W.

Chains.

70.00 North edge of lake, bears E. and W.

No difference in measurement between the two sets of chainmen.

80.00 Set a granitestone 13 X 11 X 9 ins. 9 ins. in the ground for cor. of secs. 1, 6, 7 and 12, marked with 5 notches on S. and 1 notch on N. edges, from which, see corrected notes page 85

A spruce 20 ins. diam. bears N. 25° W. 32 lks. dist. marked T 12 N R 1 W S 1 B T .

A spruce 4 ins. diam. bears S. 70° W. 17 lks. dist. marked T 12 N R 1 W S 12 B T .

A spruce 5 ins. diam. bears S. 30° E. 17 lks. dist. marked T 12 N R 1 E S 7 B T .

A spruce 14 ins. diam. bears S. 14° E. 43 lks. dist. marked T 12 N R 1 E S 7 B T .

Land rolling. Soil 1st to 4th rate.

Timber, spruce and dense underbrush.

June 9: I set off 22° 57' N. on the decl. arc. and at 11h 59m a.m. l.m.t. observe the sun on the meridian, the resulting lat. is 62° 15' N.

North bet. secs. 1 and 6.

Over rolling land, through scattering spruce, and dense brush.

No difference in measurement between the two sets of chainmen.

40.00 Set a granitestone 13 X 12 X 9 ins. 9 ins. in the ground for 1/4 sec. cor. marked 1/4 on W. face, from which,

A spruce 13 ins. diam. bears N. 48° W. 50 lks. dist. marked 1/4 S 1 B T .

A spruce 6 ins. diam. bears N. 68° E. 125 lks. dist. marked 1/4 S 6 B T .

66.00 Asc. gradually.

74.00 Top of ridge, bears S. 60° E. and N. 60° W. desc.

No difference in measurement between the two sets of chainmen.

80.00 Set a granitestone 20 X 14 X 8 ins. 15 ins. in the ground for cor. of Tps. 12 and 13 N. Rs. 1 E. and 1 W.

Chains. marked S C T 13 N on N. E., R 1 E on S. E., T 12 N on S. W., and R 1 W on N. W., faces, with 6 notches on each edge, from which,

A spruce 6 ins. diam. bears N. 63° W. 9 lks. dist. marked T 13 N R 1 W S 36 B T.

A spruce 4 ins. diam. bears S. 29° 30' W. 31 lks. dist. marked T 12 N R 1 W S 1 B T.

A spruce 8 ins. diam. bears N. 52° E. 50 lks. dist. marked T 13 N R 1 E S 31 B T.

A spruce 12 ins. diam. bears S. 34° 45' E. 75 lks. dist. marked T 12 N R 1 E S 6 B T.

Land rolling. Soil 1st to 4th rate.

Timber, spruce and dense underbrush.

General Description.

The land on both sides of this line from T 1 N to T 12 N in generally level. Near the water courses the land is well drained, but back on the flat table lands there are numerous swamps, wet meadows, ponds and lakes laying from 1 to 6 feet above the level land.

The soil is generally a gray or blue clay with gravel and boulders in places and is generally 1st rate. The entire country is covered with a bed of moss and lichen from 1 to 12 ins. in depth, except where it has been burned away by forest fires. This covering of moss holds the moisture and also prevents the thawing of the soil until late in the summer,- thus stunting the growth of all vegetation. Where the land is not well drained, the only timber which can grow is scrubby spruce, but along the water courses and on rolling land, spruce, cottonwood, aspen, birch, willow and alder grow to a size suitable for commercial purposes.

Settlements have been made in Tps. 1, 2, and 6 N., R. 1 E., Tps. 2, 3, 4 and 5 N. R. 1 W., and these Tps. should be surveyed.

Alfred B. Lewis

U. S. Deputy Surveyor.

Chains. Polaris not being visible at this season of the year, in order to test the solar apparatus by comparing results of observations on the sun made during a.m. and p.m. hours with the true meridian determined by direct observation made on the sun I proceed as follows: My instrument is 6.54 ft. S. of Tp. cor. 12 and 13 N. Rs. 1 E. and 1 W.

June 9: At 4 h p.m. l.m.t. I set off 62° 51' N. on the lat. arc. 22° 58' N. on the decl. arc. and mark the meridian thus determined with the solar by a cross on a stone firmly set in the ground 3.00 chs. N. of my station. I then unclamp my vernier plate and observe the sun direct; the observed altitude of the lower limb of the sun is 27° 24' + 16' for semi-diam. = 27° 40' - 02' for refraction = 27° 38' the true altitude of the sun's center. The azimuth of the sun's center by the vernier plate is 93° 13'. I calculate the true azimuth by the formula

$$\text{Cos } 1/2 \text{ Az} = \sqrt{\frac{\text{Cos. S. Cos. (S-P D)}}{\text{Cos. L. Cos. h.}}}$$

P.D. = 67°03'			
Lat. = 62°51'	A.C. Log. Cos.		0.34072
Alt. = 27°38'	" " " "		0.05259
2 S 2)157°32'			
S = 78°46'		Log Cos.	9.28960
S-P D= 11°43'		" "	9.99086
Square Root =		2)	19.67377
Gives Log Cos. 1/2 Az (46°37')		=	9.83688
Az =	93°14'		

June 9, 1905.

June 10, 1905. At 7h a.m. l.m.t. I set the telescope on the meridian established yesterday, then unclamp the vernier plate and observe the sun direct; the observed alt. of the lower limb of the sun is 25°20' + 16' for semi-dia. = 25° 36' - 02' for refraction = 25° 34' the true alt. of the sun's center. The azimuth of the center of the sun by the vernier plate is 89° 02'. I calculate the true azimuth as follows:

Chains. P.D. = 67° 00'			
Lat. = 62° 51'	A. C. Log Cos.		0.34072
Alt. = 25° 34'	" " " "		0.04474
2 S=2)155° 25'			
S = 77° 42'	Log. Cos.		9.32844
S-P D= 10° 42'	" "		9.99238
Square Root		2)	19.70628
Gives Log. Cos. 1/2 Az. (44°31')			9.85314
Az =	89°02'		

At 8h a.m. l.m.t. I set off 62° 51' N. on the lat. arc. 23° 02' N. on the decl. arc. and determine the meridian with the solar which coincides with the meridian established yesterday, therefore I conclude the adjustments of the solar are satisfactory.

May 1, 1905: At my camp which is situated on the West side of the Gakona River across the river from George Rorers' Trading Post, I examine the adjustments of my transit, 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:

I set my transit over a tack in ahub firmly driven in the ground. At 5h p.m. l.m.t. I set off 62° 18' N. on the lat. arc. 15° 11' N. on the decl. arc. and determine with the solar a meridian which I mark on a peg driven in the ground 3 chs. N. of my station.

At 11h 30m p.m. l.m.t. I begin to observe the Eastern progress of Polaris in accordance with instrustions on page 96 of the manual. When Polaris and Delta are in the same vertical plane I note the time by my watch and continue to follow Polaris for five minutes when it is upon the meridian, and mark the point thus determined on the peg 3 chs. N. of my station.

May 1, 1905.

May 2, 1905: At 7h a.m. l.m.t. I set off 62° 18' N. on the lat. arc. 15° 21' N. on the decl. arc. and determine the meridian with the solar and mark a

Chains. point on the peg 3 chs. N. of my station, which practically coincides with the two points marked yesterday; therefore I conclude the adjustments of the instrument are satisfactory.

May 24: At my camp above described under date of May 1, 1905 I test the solar apparatus by an a.m. and p.m. observation on the meridian established by observations on Polaris May 1, 1905.

At 4h p.m. l.m.t. I set off 62° 18' N. on the lat. arc. 20° 49' N. on the decl. arc. and determine a meridian with the solar which coincides with the one heretofore established.

May 24, 1905.

May 25: At 7h a.m. l.m.t. I set off 62° 18' N. on the lat. arc. 20° 57' N. on the decl. arc. and determine a meridian which also coincides with the ones heretofore described, therefore I conclude the adjustments of the instrument are correct.

May 25, 1905

Alfred B. Lewis.
U.S. Deputy Surveyor

I establish the Cor.of Tps.1 and 2 N.Rs.1 E.and 1 W.as follows;-

Set a granite stone 24 x 14 x 4 ins.18 ins,in the ground forCor.,marked T 2 N on NE.R 1 E on SE., T 1 N on SW.,and R 1 W on NW.faces,with 6 notches on each edge,dig pits 24 x 24 x 12 ins.on each line N.E.and W.4 ft.dist.and south of stone 8 ft. dist. and raise a mound of earth 5 ft.base 2 1/2 ft. high S.of corner.

At the corner of sections 25,30,31 and 36, T.2 N.Rs.1 E & 1 w. in addition to the bearing trees,I dig pits 18 x 18 x 12 ins.in each section 5 1/2 ft.dist.and raise a mound of earth 4 ft.base 2 ft.high W.of Cor.

At the corner of sections 19,24,25 and 30,T.2 N. Rs.1 E.and 1 W.

A spruce 10 ins.diam.bears N.83°W.22 lks.dist. marked T 2 N R 1 W S 24 B T.

A spruce 12 ins.diam.bears N.49°30'W. 70 lks.dist. marked T 2 N R 1 W S 24 B T.

A spruce 10 ins.diam.bears S.28°45'E.67 lks.dist. marked T 2 N R 1 E S 30 B T.

A spruce 6 ins.diam.bears N.14°W.94 lks.dist. marked T 2 N R 1 W S 24 B T.

dig pits 18 x 18 x 12 ins.in each section 5 1/2 ft. dist.and raise a mound of earth 4 ft.base 2 ft. high W.of corner.

At the 1/4 section cornerbetween sections 19 and 24,T.2 N.Rs.1 E.and 1 W.

A slatestone 12 x 10 x 5 ins.set 8 ins.in the ground marked 1/4 on W.face,from which,

A spruce 18 ins.diam.bears S.33°30'W. 66 lks.dist. marked 1/4 S 24 B T.

Chains. A spruce 16 ins.diam.bears S.67°E.28 lks.dist. marked 1/4 S 19 B.T.

The corner of sections 13,18,19 and 24 T.2.N. Rs.1 E.&W.M.W ,a slate-stone 14 x 10 x 8 ins.set 10 ins.in the ground and witnessed as described in the fieldnotes.

North between sections 13 and 18. T.2.N. Rs.1 E.&W.M.W

Descending through burned and open ground.

1.00 Bottom of descent.Enter Klutina Valley,course N.20° E.and S.20° W.and run over level land.

27.04 Set a slatestone 16 x 12 x 7 ins.12 ins.in the ground for witness corner to meander corner of fracl.secs.13 and 18,marked W C M C on N.T 2 N on S.S 18 R 1 E on E.and S 13 R 1 W on west faces, from which a post 8 x 8 ins.8 ft.high bears East 60 lks.dist.marked W C M C T 2 N R 1 E S 18 B O. and raise a mound of stone 2 ft.base 1 1/2 ft. high S.of corner. Pits impracticable.

27.60 Edge of river bank 8 ft.high.True point for M.C. Impracticable to set.

27.80 Center branch of river 20 lks.wide flows S.80° E.

29.00 Edge of main stream.

36.07 Edge of water on left bank Klutina river flows S.80° E.

36.23 Set a slatestone 24 x 8 x 5 ins. 16 ins.in the ground for meander corner of fracl.secs.13 and 18 marked M C on S.T 2 N on N.S 18 R 1 E on E.S 13 R 1 W on W.faces,and raise a mound of stone 2 ft.base 1 1/2 ft.high N.of corner.

36.53 Set a lavastone 14 x 12 x 11 ins.11 ins.in the ground for witness corner to meander corner of fracl.secs.13 and 18 marked W C M C on S.T 2 N on N.,S 18 R 1 E on E. S 13 R 1 W on W.faces, from which a cotton wood 16 ins.diam.bears S.61° 30'W 156 lks.dist.marked W C M C T 2 N R 1 W S 13 B T. A cottonwood 8 ins.diam.bears N.28° 30'E.204 lks.dist. marked W C M C T 2 N R 1 E S 18 B T.

Chains.

40.00 Set a grahite stone 14 x 8 x 6 ins.10 ins.in the ground for 1/4 sec.cor.marked 1/4 on W.face from which a spruce 6 ins.diam.bears S.80° W.132 lks.dist marked 1/4 S 13 B T.

A spruce 8 ins.diam.bears N.67° E.186 lks.dist. marked 1/4 S.18 B.T.

The distance to NW.bearing tree at the corner of sections 7,12 13 and 18 T.2 N. R.1 E. and 1 NW is 1.84 Chs.dist.instead of 1.74 Chs.

The distance to the meander corner off fracl.secs. 7 and 12 T.2 N. R.1 E. and 1 NW on right bank of Copper Riveris 39.29 Chs. I mark M C on N. T 2 N on S.S 7 R 1 E on E.S 12 R 1 W on W.and raise a mound of stone 2 ft.base 1 1/2 ft.high S.of corner.in addition to the bearing trees.

40.00 The 1/4 sec.cor.between secs.7 and 12 falls in river.

51.00 North edge of river at extreme low water.

51.50 North edge of river at High water.

51.85 Set a quartz rock 16 x 8 x 7 ins.12 ins.in the ground for meander corner to fracl.secs.7 and 12 marked M C on S.T 2 N on N. R 1 E S 7 on E.and S 12 R 1 W on W.faces,and raise a mound of stone 2 ft.base 1 1/2 ft.high N. of corner.

Over gravel bar covered with alder brush,

60.00 Right edge high water channel flows S.40° E.

63.00 Left edge of high water channel flows same,

71.30 Set a slatestone 14 x 8 x 5 ins. 10 ins.in the ground for meander corner of fracl.secs.7 and 12 marked M C on N.,T 2 N on S.,S 7 R 1 E on E.and S 12 R 1 W on W.faces,from which

A spruce 6 ins.diam.bears S 0°.30'W.101 lks.dist. marked M C T 2 N R 1 W S 12 B T.

A spruce 6 ins.diam.bears S.45° E.65 lks.dist. marked M C T 2 N R 1 E S 7 B T.

Chains. A spruce 7 ins.diam.bears S.84° E.81 lks.dist. marked M C T 2 N R 1 E S 7 B T.

71.50 Descend to river,

71.80 Edge of high water.

80.00 Cor.of secs.1,6,7 and 12,falls in river.

North between secs.1 and 6, T.2 N.

40.00 1/4 sec.cor.falls in river.

54.00 Edge of bank at low water.

54.26 Top of bank .

54.32 Set a granitestone 16 x 10 x 8 ins.12 ins.in the ground for meamder corner of fracl.secs.1 and 6 marked M C on S.,T 2 N on N.,S 6 R 1 E on E.,and S 1 R 1 W on W.facesfrom which,

A spruce 8 ins.diam.bears S.36° E.166 lks.dist. marked M C T 2 N R 1 E S 6 B T.

A spruce 8 ins.diam.bears S.44 E.189 lks.dist. marked M C T 2 N R 1 E S 6 B T. and raise a mound of stone 2 ft.base 1 1/2 ft.high N.of Corner.

59.00 Old bank of river bears N.20° W. and S.20° E.

60.00 I obliterate this meander corner.

Insert description

At corner of secs.7,12,13 and 18,T 3 N R 1 E.and R.1 W.in addition to trees I dig pits 18 x 18 x 12 ins.in each section 5 1/2 ft.dist.and raise a mound of earth 4 ft.base 2 ft.high W.of Cor.

The meander corner to fracl.secs .19 and 24,T 6 N. between Rs,1E. and 1 W.on left bank of Copper River I mark M C on N.,T 6 N on S.,S 19 R 1 E.on E.and S.24 R 1 W on W.faces.

The meander corner to fracl.secs.13 and 18,T.6 N. Rs.1 E.and 1 W.on right bank of Gakona River I re-establish as follows:-

North between secs.13 and 18,

32.84 North side of channel of Gakona River

Chains.
32.84 Set a slatestone 12 x 10 x 8 ins.8 ins.in the ground meander Cor.to fracl.secs 13 and 18 , marked M C on S.,T 6 N on N.,S 18 R 1 E on E. and S 13 R 1 W on W.faces,and raise a mound of stone 2 ft.base 1 1/2 ft.high N.of Corner.

33.84 Set a lavastone 14 x 10 x 8 ins.10 ins.in the ground for witness corner to meander corner of fracl.secs.13 and 18,marked W C M C on S.,T 6 N on N.,S 18 R 1 E on E.and S 13 R 1 W on W.faces, from which a spruce 8 ins.diam.bears N.7°30'W. 66 lks.dist.marked W C M C T 6 N R 1 W S 13, B T. A spruce 5 ins.diam.bears N.25°30'E.104 lks.dist. marked W C M C T 6 N R 1 E S 18 B T.

The NE.bearing tree to 1/4 sec.cor.between Secs. 31 and 36 ,T. 7 N. R. 1 E. and R. 1 W. is a spruce 5 ins.diam.and bears N.75°30'E.26 lks.dist.

At the corner of sections 25,30,31 and 36,T.7 N. R.1 E.and R.1 W. I obliterate the bearing tree which is N.90°W.and mark another as follows:- A spruce 8 ins.diam.bears N.58°40'W.42 lks.dist. marked T 7 N R 1 W S 25 B T.

The meander corner to fracl.secs.13 and 18 T. 9 N. Rs.1 E.and 1 W.on S.side of lake I mark M C on N. T 9 N on S.,S 18 R 1 E on E.,and S 13 R 1 W on W. faces.

The meander corner for fracl.secs.13 and 18 ,T. 9 N, R. 1 E. and R.1 W. on N.side of lake I mark M C on S.,T 9 N on N., S 18 R.1 E on E. and S 13 R 1 W on W.faces.

The meander corner to fracl.secs.1 and 6,T.9 N. R.1 E.and R.1 W.on S.side of lake I mark M C on N, T 9 N on S.,S 6 R 1 E on E.and S 1 R 1 W on W.faces.

The meander corner to fracl.sees.1 and 6 T.9 N. R.1 E.and R.1 W.on north side of lake I mark M C on S.,T 9 N on N.,S 6 R 1 E on E.and S 1 R 1 W on W.faces.

The meander corner to fracl.secs.31 and 36,on south side of lake T.10 N.,R.1 E.and R.1 W.,I mark M C on N. T 10 N on S.,S 31 R 1 E on E.,and S 36 R 1 W on W. faces.

The meander corner to fracl.secs.25 and 30 T.10 N. between Rs.1 E.and 1 W.,on north side of lake I mark M C On S., T 10 N on N., S 30 R 1 E on E.and S 25 R 1 W on W.faces.

The meander corner to fracl.secs.25 and 30,T 10 N. Between Rs.1 E.and 1 W.on S.side of lake I mark M C On N.,T 10 N on S.,S 30 R 1 E on E. and S 25 R 1 W on W.faces.

The meander corner to fracl.secs.19 and 24 ,T.10 N. Rs.1 E.and 1 W. on N.side of lake I mark M C on S., T 10 N on N., S 19 R 1 E on E.and S 24 R 1 W on W.faces.

The meander corner to fracl.secs.19 and 24 T.10 N. Rs.1 E.and 1 W.on S.side of lake I mark M C on N., T 10 N on S.,S 19 R 1 E on E.and S 24 R 1 W on W. faces.

The meander corner to fracl.secs.19 and 24 T.10 N. Rs.1 E.and 1 W. on north side of lake I mark M C on S.T 10 N on N.,S 19 R 1 E on E.and S 24 R 1 W on W.faces.

At the corner of sections 7,12 13 and 18 ,T.10 N. Rs.1 E.and 1 W. in addition to bearing trees I dig pits 18 x 18 x 12 ins.in each section 5 1/2 ft.dist. and raise a mound of earth 4 ft.base 2 ft.high W.of corner.

At the corner of sections 1,6,7,and 12,T 10 N. Rs.1 E.and 1 W. in addition to bearing trees I dig pits 18 x 18 x 12 ins in each section 5 1/2 ft dist. and raise a mound of earth 4 ft.base 2 ft.high W.of corner.

At the corner of sections 1,6,7,and 12 ,T.12 N. Rs.1 E.and 1 W. in addition to bearing trees I dig pits 18 x 18 x 12 ins.in each section 5 1/2 ft. dist.and raise a mound of earth 4 ft.base 2 ft.high W.of corner.

Preliminary Oaths of Assistants.

I, S. C. Lewis, do solemnly swear that I will well and faithfully execute the duties of chainman, that I will level the chain upon even and uneven ground, and plumb the tally pins, either by sticking or dropping the same, that I will report the true distances to all notable objects, and the true lengths of all lines that I assist in measuring, to the best of my skill and ability, and in accordance with instructions given me in the survey of the Copper River Base Line, Principal Meridian, Third Standard Parallel North, and Third Guide Meridian East.

S. C. Lewis, Chainman.

Subscribed and sworn to before me
this First day of October, 1907.

J. H. Murray,
(SEAL) Notary Public.

Final Oaths of Assistants.

List of Names.

A list of the names of the individuals employed by Alfred B. Lewis, 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 Copper River Base Line, Principal Meridian, Third Standard Parallel North, and Third Guide Meridian East, in the District of Alaska, showing the respective capacities in which he acted.

S. C. Lewis, Chainman.

++++++++++++++++++++++++

Final Oaths of Assistants.

I hereby certify that I assisted Alfred B. Lewis, United States Deputy Surveyor, in surveying Copper River Base Line, Principal Meridian, Third Standard Parallel North, and Third Guide Meridian East, which is 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 my knowledge and belief, well and faithfully surveyed, and the corner monuments established according to the instructions furnished by the United States Surveyor General for Alaska.

S. C. Lewis, Chainman.

Subscribed and sworn to before me
this First day of October, 1907.

J. H. Murray,
Notary Public,

(SEAL)

Final Oath of U. S. Deputy Surveyor.

I, Alfred E. Lewis, United States Deputy Surveyor, do solemnly swear that the attached supplemental field notes of the survey of the Copper River Base Line, Principal Meridian, Third Standard Parallel North, and the Third Guide Meridian East, are true and correct, and are a part of the field notes filed by me under Contract No. 3.

Alfred E. Lewis,

U. S. Deputy Surveyor.

Subscribed and sworn to before me
this Twenty-sixth day of September,
1907.

Edward J. Stier,

Clerk, U. S. District Court for the
District of Alaska, Third Division.

by S. A. Crandall, Deputy.

FINAL OATHS OF DEPUTY SURVEYOR AND HIS ASSISTANTS.

LIST OF NAMES.

A list of the names of the individuals employed by Alfred B Lewis, 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 Principal Meridian through Townships Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 and 12 North between Ranges 1 E. and 1 W. of the Copper River Base and Meridian in the District of Alaska, showing the respective capacities in which they acted:

J. C. Bruce, J. C. Drake, Chainman.
Paul Drake, Dan Sheehan, Chainman.
S. C. Lewis, Moundman.
, Moundman.
W. H. Johnston, Axman.
Dan Sheehan, Axman.
Fred C Bruce, Flagman.

FINAL OATH OF ASSISTANTS.

We hereby certify that we assisted Alfred B Lewis, United States Deputy Surveyor, in surveying all those parts or portions of the Principal Meridian, through Townships Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 and 12, of the Copper River Base and Meridian in the District of Alaska ~~of the~~ ~~meridian,~~ ~~of~~, 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 Alaska

Fred Bruce, Paul Drake, Chainman.
J. C. Drake, Daniel W. Sheehan, Chainman.
S C Lewis, Moundman.
, Moundman.
W H Johnston, Axman.
Daniel W. Sheehan, Axman.
Fred Bruce, Flagman.

Subscribed and sworn to before me this 30th day of September 1905, 189

SEAL

John Lyons
U.S. Commissioner for Alaska

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FINAL OATH OF UNITED STATES DEPUTY SURVEYOR.

I, Alfred B. Lewis, United States Deputy Surveyor, do solemnly swear that, in pursuance of a contract received from Wm L. Dustin United States Surveyor General for Alaska, bearing date of the twenty-first day of March 1904, ~~189~~, 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 Alaska, the Manual of Surveying Instructions, and the laws of the United States, surveyed all those parts or portions of the Principal Meridian through Townships Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 and 12 North, between Ranges No. 1 E. and No. 1 W. of the Copper River Base and Meridian in the District of Alaska ~~of the meridian, in the~~ ~~of~~, 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 Alaska and in the specific manner described in the field notes, and that the foregoing are the original field notes of such survey; and should any fraud be detected, I will suffer the penalty of perjury under the provisions of an Act of Congress approved August 8, 1846.

Alfred B. Lewis
United States Deputy Surveyor.

Subscribed by said Alfred B. Lewis, and sworn to before me this 30th day of September 1905 ~~189~~

John Sood
U.S. Commissioner for Alaska

SEAL

APPROVAL.

OFFICE OF THE UNITED STATES SURVEYOR GENERAL,
Juneau, Alaska,
January 28, 1908, ~~189~~

The foregoing field notes of the survey of the Principal Meridian through Townships Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 and 12 North, between Ranges No. 1 East and No. 1 West of the Copper River Base and Meridian in the District of Alaska

executed by Alfred B. Lewis under his contract No. 3, dated March 21, 1904, ~~189~~, having been critically examined, and the necessary corrections and explanations made, the said field notes, and the surveys they describe, are hereby approved.

Wm L. Dustin
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.

4—679.

RECEIVED
S. G. O.
NOV 20 1905
ANSWERED
484
Returned Feb 19 1906
RECEIVED
S. G. O.
JUN 19 1906
ANSWERED

FIELD NOTES

OF THE SURVEY OF THE

Principal Base
through
Ranges, No. 1 W. and Nos. 1 and 2 E
of the
Copper River Base and Meridian
in the
District of Alaska

Of the ..... *Meridian,*

AS SURVEYED BY

Alfred B. Lewis, *United States Deputy Surveyor,*

Under his Contract No. 3, *dated* March 21, 1904, *189*

Survey commenced May 8, 1905, *189*

Survey completed May 19, 1905, *189*

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NAMES AND DUTIES OF ASSISTANTS.

L. C. Bunce	Chainman
J. C. Drake	Chainman
Paul Drake	Chainman
Dan W. Sheehan	Chainman
S. C. Lewis	Mounderman
W. H. Johnston	Axman
Dan W. Sheehan	Axman
F. C. Bunce	Flagman

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T. 1. N. R. 1 W.

31	32	33	34	35	36
5	4	4	3	2	1 19

T. 1. N. R 1 E.

31	32	33	34	35	36
6	7	7	8 19	9	10

T. 1. N R. 2. E.

31	32	33	34	35	36
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Meanders Page.....

PRELIMINARY OATHS OF ASSISTANTS.

WE, F. C. Bunce Paul Drake and J. O. Drake & Dan W. Sheehan do solemnly swear that we will well and faithfully execute the duties of chainmen; that we will level the chain over 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 principal Base through Ranges No. 1 W and Nos. 1 and 2 E of the Copper River Base and Meridian in the District of Alaska

F. C. Bunce, Chainman.

Paul Drake, Chainman.

J. O. Drake

Dan W. Sheehan

Subscribed and sworn to before me this 1st day of April, 1895

SEAL

Andrew Holman
U.S. Commissioner

WE, S. C. Lewis 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 Principal Base through Ranges Nos. 1 W. and 1 and 2 E. of the Copper River Base and Meridian in the District of Alaska.

S. C. Lewis, Moundman.

, Moundman.

Subscribed and sworn to before me this 1st day of April, 1895

SEAL

Andrew Holman
U.S. Commissioner

WE, W. H. Johnston and Dan W. Sheehan 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 Principal Base through Ranges Nos. 1 W and 1 and 2 E. of the Copper River Base and Meridian, in the District of Alaska.

W. H. Johnston, Axman.

Dan W. Sheehan, Axman.

Subscribed and sworn to before me this 1st day of April, 189

SEAL

Andrew Holman
U.S. Commissioner

I, F. C. Bunce, 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 Principal Base through Ranges Nos. 1 W and 1 and 2 E of the Copper River Base and Meridian, in the district of Alaska.

F. C. Bunce, Flagman.

Subscribed and sworn to before me this 1st day of April, 189

SEAL

Andrew Holman
U.S. Commissioner

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Chains. Survey commenced May 8, 1905 and executed with an A. Leitz Compound Mining and Solar Transit. The horizontal limb is provided with two double verniers reading to single minutes of arc which is also the least count of the lat. and decl. arc. The instrument was examined and found to be in correct adjustment prior to the begining of this survey and certificate filed in the office of the Surveyor General for Alaska.

I begin at the initial point which is the cor. of Tps. 1 N. and 1 S. Rs. 1 E. and 1 W. established by me on April 17, 1905.

At a point 6.27 ft. S. of said cor. in lat. 61° 48' 13.5" N. long/ 145° 22' 48.8" W., at 10h p.m. l.m.t. I begin to observe the Eastern progress of Polaris in accordance with instructions on page 96 of the manual.

When Polaris and Delta are in the same vertical plane I note the time by my watch and continue to follow Polaris for 5 minutes when it is upon the meridian. I mark the true meridian thus found by a cross on a stone firmly set in the ground 5 chs. N. of my station.

The mag. bearing of the true meridian is N. 30° 15' W. which gives the mag. decl. N. 30° 15' E.

May 8, 1905.

May 9, 1905. at this station i.e. the point 6.27 ft. S. of the cor. I turn off an angle of 89° 55.1' to the W. and run

N. 89° 55' W. on the secant S. of sec. 36.

Over rolling and mountainous land, through thick spruce and birch timber. Asc.

No difference in measurement between the two sets of chainmen.

40.00 N. 2.83 ft. from secant.

Set a lavastone 16 X 10 X 6 ins. 12 ins. in the ground for standard 1/4 sec. cor. marked S C 1/4 on N., face from which, as corrected notes page 19

A birch 12 ins. diam. bears N. 65° 15' W. 26 lks. dist. marked S C 1/4 S 36 B T .

A birch 6 ins. diam. bears N. 85° 25' E. 46 lks. dist. marked S C 1/4 S 36 B T .

Chains.

43.00 Asc. abruptly to top of spur of mountain, slopes N. 60° W.

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48.00 Desc. from spur.

65.00 Foot of descent, bears S. 60° W. and N. 60° E.

No difference in measurement between the two sets of chainmen.

80.00 Set a greenstone 16 X 10 X 8 ins. 12 ins. in the ground for standard cor. of secs. 35 and 36, marked S C on N., with 1 groove on E. and 5 grooves on W. face, from which,

A spruce 6 ins. diam. bears N. 82° 10' E. 125 lks. dist. marked T 1 N R 1 W S 36 B T .

A spruce 7 ins. diam. bears N. 77° 10' W. 66 lks. dist. marked T 1 N R 1 W S 35 B T .

Land mountainous and rolling.

Soil 4th rate.

Timber, spruce, birch and alder.

North 89° 57' W. on the secant through sec. 35.

Over rolling land, through spruce timber.

34.50 Desc. abruptly into gulch.

35.75 Willow Creek 8 lks. wide, drains N. 10° E. Asc.

38.00 Top of W. side of gulch, over rolling land.

No difference in measurement between the two sets of chainmen.

40.00 S. 2.19 ft. from secant.

Set a lavastone 16 X 8 X 6 ins. 12 ins. in the ground for standard 1/4 sec. cor. marked S C 1/4 on N. face, from which,

A spruce 6 ins. diam. bears N. 71° 40' E. 113 lks. dist. marked S C 1/4 S 35 B T .

A spruce 7 ins. diam. bears N. 22° W. 62 lks. dist. marked S C 1/4 S 35 B T .

Asc. gradually.

48.00 Top of ascent, bears N. and S. over level land.

No difference in measurement between two sets of chainmen.

80.00 S. 3.76 ft. from secant.

Set a lavastone 15 X 8 X 6 ins. 12 ins. in the ground for standard cor. of secs. 34 and 35, marked

Base Line through R. 1 W.

Chains. S C on N. face, with 2 grooves on E. and 4 grooves on W. face, from which,

A spruce 5 ins. diam. bears N. 72° 20' E. 50 lks. dist. marked T 1 N R 1 W S 35 B T .

A spruce 5 ins. diam. bears N. 42° W. 32 lks. dist. marked T 1 N R 1 W S 34 B T .

Land rolling and level.

Soil, 1st and 4th rate.

Timber, spruce.

N. 89° 58' W. on secant through sec. 34.

Over rolling land, through spruce timber.

1.00 Desc. into gulch.

7.50 Creek 10 lks. wide 1 ft. deep, flows N. 10° E.

Asc. abruptly.

11.00 Top of bank, bears N. 10° E. and S. 10° W.

Over level land.

21.19 Cross old trail, bears N. E. and S. W.

No difference in measurement between the two sets of chainmen.

40.00 S. 4.70 ft. from secant.

Set a lavastone 16 X 14 X 5 ins. 12 ins. in the ground for standard 1/4 sec. cor. marked S C 1/4 on N. face, from which,

A spruce 5 ins. diam. bears N. 52° 50' W. 60 lks. dist. marked S C 1/4 S 34 B T .

A spruce 5 ins. diam. bears N. 41° 50' E. 45 lks. dist. marked S C 1/4 S 34 B T .

No difference in measurement between the two sets of chainmen.

80.00 S. 5.01 ft. from secant.

Set a lavastone 16 X 15 X 12 ins . 12 ins. in the ground for standard cor. of secs. 33 and 34, marked S C on N., with 3 grooves on E. and W. faces; dig pits 24 X 18 X 12 ins. crosswise on each line E. and W. 3 ft. and N. of stone 7 ft. dist. and raise a mound of earth 4 ft. base 2 ft. high N. of cor.

Land rolling. Soil, 1st and 2nd rate.

Timber, spruce.

May 9, 1905.

Chains. W. on secant, through sec. 33.

Over rolling land, through spruce timber.

29.00 Desc. gradually, bears N. and S.

No difference in measurement between the two sets of chainmen.

40.00 S. 4.70 ft. from secant.

Set a lavastone 14 X 8 X 7 ins. 10 ins. in the ground for standard 1/4 sec. cor. marked S C 1/4 on N. face, from which,

A spruce 11 ins. diam. bears N. 42° 20' W. 11 lks. dist. marked S C 1/4 S 33 B T .

A spruce 14 ins. diam. bears N. 72° 45' E. 42 lks. dist. marked S C 1/4 S 33 B T .

No difference in measurement between the two sets of chainmen.

80.00 S. 3.76 ft. from secant.

Set a granitestone 16 X 8 X 6 ins. 12 ins. in the ground for standard cor. of secs. 32 and 33, marked S C on N., with 4 grooves on E. and 2 grooves on W. faces, from which,

A spruce 16 ins. diam. bears N. 51° W. 43 lks. dist. marked T 1 N R 1 W S 32 B T .

A spruce 8 ins. diam. bears N. 43° E. 32 lks. dist. marked T 1 N R 1 W S 33 B T .

Land rolling Soil, 1st and 2nd rate.

Timber, spruce.

S. 89° 58' W. on secant through sec. 32.

Desc. over rolling land, through scattering spruce and aspen.

No difference in measurement between the two sets of chainmen.

40.00 S. 2.19 ft. from secant.

Set a lavastone 16 X 12 X 8 ins. 12 ins. in the ground for standard 1/4 sec. cor. marked S C 1/4 on N. face, from which,

A spruce 5 ins. diam. bears N. 25° 40' W. 54 lks. dist. marked S C 1/4 S 32 B T .

A spruce 10 ins. diam. bears N. 59° 55' E. 38 lks. dist. marked S C 1/4 S 32 B T .

Chains. No difference in measurement between the two sets of chainmen.

80.00 Set a granitestone 16 X 12 X 10 ins. 12 ins. in the ground for standard cor. for secs. 31 and 32, marked S C on N., with 5 grooves on E. and 1 groove on W. face, from which,

A spruce 4 ins. diam. bears N. 9° E. 123 lks. dist. marked T 1 N R 1 W S 32 B T .

A spruce 5 ins. diam. bears N. 44° 50' E. 178 lks. dist. marked T 1 N R 1 W S 32 B T .

Land level and rolling.

Soil, 1st and 4th rate.

Timber, spruce, partly burned.

S. 89° 57' W. on secant S. of sec. 31.

Over rolling land, through burned timber.

No difference in measurement between the two sets of chainmen.

40.00 N. 2.83 ft. from secant.

Set a lavastone 15 X 9 X 6 ins. 12 ins. in the ground for standard 1/4 sec. cor. marked S C 1/4 on N. face; and raise a mound of stone 2 ft. base 1 1/2 ft. high N. of cor. Pits impracticable.

No difference in measurement between the two sets of chainmen.

80.00 N. 6.27 ft. from secant.

Set a lavastone 16 X 14 X 12 ins. 12 ins. in the ground for standard cor. of Tp. 1 N. Rs. 1 and 2 W. marked S C T 1 N on N., R 1 W on E., R 2 W on W., with 6 grooves on N. , E., and W., faces; and raise a mound of stone 2 ft. base 1 1/2 ft. high N. of cor. Pits impracticable.

Land rolling.

Soil, 1st and 4th rate.

Timber, spruce, mostly burned.

May 10, 1905, I set up the instrument 6.27 ft. S. of the last described Tp. cor. and at 7h p.m. l.m.t. direct the telescope to my back sight at the standard cor. of secs. 31 and 32, which is on the secant. At 10h p.m. l.m.t. I unclamp the vernier plate and begin to observe Polaris in accordance with in-

Chains. structions on page 96 of the manual. The angle between the meridian thus determined and my back sight is 89° 55', making the observed bearing of the back sight N. 89° 55' E. which it should be; therefore I deem the base line satisfactorily established.

May 10, 1905.

May 12, 1905. I return to my station 6.27 ft. S. of the initial point and cor. of T 1 N and 1 S Rs. 1 E. and 1 W., and from the meridian which I established on May 9, I turn 89° 55.1' E. and run

N. 89° 55' E. on the secant S. of sec. 31.

Over rolling land, through spruce timber.

16.95 Center of mountain stream 40 lks. wide, flows N. 10° W.

21.00 Desc. gradually.

No difference in measurement between the two sets of chainmen.

40.00 North 2.83 ft. from secant.

Set a lavastone 12 X 12 X 10 ins. 8 ins. in the ground for standard 1/4 sec. cor. marked S C 1/4 on N. face, from which,

A spruce 5 ins. diam. bears N. 88° 15' W. 38 lks. dist. marked S C 1/4 S 31 B T .

A spruce 5 ins. diam. bears N. 72° E. 49 lks. dist. marked S C 1/4 S 31 B T .

56.50 Creek 10 lks. wide, flows N. Asc. slightly.

58.00 Desc. gradually, bears N. and S.

No difference in measurement between the two sets of chainmen.

80.00 Set a greenstone 12 X 12 X 7 ins. 8 ins. in the ground for standard cor. for secs. 31 and 32, marked S C on N., with 1 groove on W. and 5 grooves on E. face, from which,

A spruce 4 ins. diam. bears N. 28° 20' W. 54 lks. dist. marked T 1 N R 1 E S 31 B T .

A spruce 4 ins. diam. bears N. 31° 15' E. 59 lks. dist. marked T 1 N R 1 E S 32 B T .

Land rolling. Soil, 4th rate.

Timber, spruce.

Chains. N. 89° 57' E. on the secant through sec. 32.

Desc. gradually over rolling land, through thick spruce and aspen.

No difference in measurement between the two sets of chainmen.

40.00 S. 2.19 ft. from secant.

Set a greenstone 12 X 10 X 7 ins. 8 ins. in the ground for standard 1/4 sec. cor. marked S C 1/4 on N. face, from which,

A spruce 8 ins. diam. bears N. 82° E. 69 lks. dist. marked S C 1/4 S 32 B T .

A spruce 5 ins. diam. bears N. 85° 40' W. 99 lks. dist. marked S C 1/4 S 32 B T .

70.00 Creek 10 lks. wide flows N. 35° E.

72.00 Creek 6 lks. wide, flows N. 60° E.

No difference in measurement between the two sets of chainmen

80.00 S. 3.76 from secant

Set a lavastone 15 X 10 X 10 ins. 10 ins. in the ground for standard cor. of secs. 32 and 33, marked S C on N., with 2 grooves on W. and 4 grooves on E. face, from which,

A spruce 9 ins. diam. bears N. 72° 20' W. 32 lks. dist. marked T 1 N R 1 E S 32 B T .

A spruce 5 ins. diam. bears N. 57° 05' E. 25 lks. dist. marked T 1 N R 1 E S 33 B T .

Land rolling

Soil, 1st and 2nd rate.

Timber, spruce and aspen.

N. 89° 58' E. on the secant, through sec. 33.

Over level land through spruce and aspen timber.

No difference in measurement between the two sets of chainmen.

40.00 S. 4.70 ft. from secant.

Set a granitestone 15 X 10 X 8 ins. 10 ins. in the ground for standard 1/4 sec. cor. marked S C 1/4 on N. face, from which,

A spruce 8 ins. diam. bears N. 86° E. 349 lks. dist. marked S C 1/4 S 33 B T .

Chains. A spruce 6 ins. diam. bears N. 73° 45' W. 196 lks. dist. marked S C 1/4 S 33 B T .

Enter burned timber, bears N. W. and S. E.

46.00 Enter green timber, bears N. W. and S. E.

No difference in measurement between the two sets of chainmen.

80.00 S. 5.01 ft. from secant.

Set a layastone 12 X 10 X 8 ins. 8 ins. in the ground for standard cor. of secs. 33 and 34. marked S C on N., with 3 grooves on E. and W. faces, from which,

A spruce 5 ins. diam. bears N. 5° 50' W. 157 lks. dist. marked T 1 N R 1 E S 33 B T .

A spruce 6 ins. diam. bears N. 33° 45' E. 162 lks. dist. marked T 1 N R 1 E S 34 B T .

Land level. Soil 1st rate.

Timber, spruce and aspen.

May 12. At my transit point which is 5.01 ft. S. of standard cor. of secs. 33 and 34, at 10h p.m. l.m.t. I begin to observe the Eastern progress of Polaris in accordance with instructions on Page 96 of the manual. 5 minutes after Polaris and Delta are in a vertical plane I set the telescope on Polaris and mark the meridian thus found upon the ground. The altitude of Polaris is 60° 36.5' which corrected for a refraction gives the true altitude 60° 36' and this added to the co-dcl of Polaris gives the lat. 61° 48' N. May 12, 1905.

As my line through sec. 33 agrees with the meridian established last night I deem it satisfactory. I run East on the secant through sec. 34.

Over level, open ground. See corrected notes page 19

11.50 Center of Willow Creek 10 lks. wide, flows S. 80° E. Enter timber.

12.00 J. Bingham's tent and log stable, bears N. 7° 30' W. 11.00 chs. dist.

12.85 The U. S. Military Wagon Road & Telegraph Line, bears N. and S.

Along S. side of J. Bingham's clearing .

Chains.

See corrected notes page 19

20.00 ~~East edge of J. Bingham's clearing, bears N.~~

No difference in measurement ~~between the~~ two sets of chainmen.

40.00 S. 4.70 ft. from secant.

Set a lavastone 12 X 10 X 10 ins. 10 ins. in the ground for standard 1/4 sec. cor. marked S C 1/4 on N. face, from which

A spruce 5 ins. diam. bears N. 42° 30' W. 35 lks. dist. marked S C 1/4 S 34 B T .

An aspen 10 ins. diam. bears N. 38° 20' E. 16 lks. dist. marked S C 1/4 S 34 B T .

60.00 Enter flat country covered with lakes and ponds.

A 40 acre lake lies 300 ft. to the N. of line.

Leave green timber.

No difference in measurement between the two sets of chainmen.

80.00 S. 3.76 ft. from secant.

Set a granitestone 16 X 10 X 8 ins. 11 ins. in the ground for standard cor. of secs. 34 and 35 marked S C on N., with 4 grooves on W. and 2 grooves on E. face, from which,

A spruce 6 ins. diam. bears N. 66° 35' E. 234 lks. dist. marked T 1 N R 1 E S 35 B T .

A spruce 4 ins. diam. bears N. 45° 20' W. 141 lks. dist. marked T 1 N R 1 E S 34 B T .

Land level and rolling.

Soil, 1st rate.

Timber, spruce, aspen and willow.

S. 89° 58' E. on sedant through sec. 35.

Over level land, through willow brush.

17.61 West edge of 20 acre lake, bears S. 45° W. and N. 70° E.

To get the dist. across the lake I set a point on secant line on E. side of lake. From my station at 17.61 chs. I run

N. 53° 30' E. 2.60 chs. the easting of which is 2.09 chs.

S. 67° 14' E. 4.00 chs. " " " " " 3.69 "

The sum of the Eastings is 5.78 "

which added to 17.61 chs. gives

Chains.

23.39 Point on E. side of lake, bears N. 70° W. and S. 45° E. This lake lies 8 ft. below level of surrounding land. And the water is clear and fresh.

27.30 Intersect summer trail between Tonsina and Copper Center, bears N and S.

No difference in measurement between the two sets of chainmen.

40.00 S. 2.19 ft. from secant.

Set a slatestone 13 X 12 X 5 ins. 9 ins. in the ground for standard 1/4 sec. cor. marked S C 1/4 on N. face; from which,

A spruce 12 ins..diam. bears N. 34° 55' E. 152 lks. dist. marked S C 1/4 S 35 B T .

A spruce 10 ins. diam. bears N. 4° 55' E. 195 lks. dist. marked S C 1/4 S 35 B T .

41.00 West edge of slough which drains S. 85° E. into large shallow pond, of fresh water.

45.00 East edge of main body of slough, bears S. 85° E. Over wet meadow land on N. side of pond.

72.00 Leave wet meadow land, enter timber, bears S. 85° E.

No difference in measurement between the two sets of chainmen.

80.00 Set a lavastone 15 X 10 X 11 ins. 10 ins. in the ground for standard cor. of secs. 35 and 36, marked S C on N., with 5 grooves on W. and 1 groove on E. faces, from which,

A spruce 7 ins. diam. bears N. 48° 40' W. 15 lks. dist. marked T 1 N R 1 E S 35 B T .

A spruce 5 ins. diam. bears N. 74° 50' E. 17 lks. dist. marked T 1 N R 1 E S 36 B T .

Land level.and swampy.

Soil 1st rate.

Timber, spruce, aspen and willow.

S. 89° 56' E. on secant S. of sec. 36.

Over level land, through willow, aspen and spruce.

No difference in measurement between the two sets of chainmen.

40.00 N. 2.83 ft. from secant.

Chains. Set a granitestone 13 X 10 X 6 ins. 9 ins. in the ground for standard 1/4 sec. cor. marked S C 1/4 on N. face, from which,

An aspen 6 ins. diam. bears N. 81° W. 32 lks. dist. marked S C 1/4 S 36 B T .

An aspen 6 ins. diam. bears N. 65° E. 54 lks. dist. marked S C 1/4 S 36 B T .

No difference in measurement between the two sets of chainmen.

80.00 N. 6.27 ft. from secant.

Set a granitestone 12 X 10 X 8 ins. 8 ins. in the ground for standard cor. of Tp. 1 N. Rs. 1 and 2 E. marked S C T 1 N on N., R 2 E on E., R 1 E on W., with 6 grooves on N., E., and W., faces, from which,

A spruce 10 ins. diam. bears N. 42° 03' W. 298 lks. dist. marked T 1 N R 1 E S 36 B T .

No other tree within 3 chs. I dig pits 30 x 24 X 12 ins. crosswise on each line, E. and W. 4 ft. and N. of stone 8 ft. dist. and raise a mound of earth 5 ft. base 2 1/2 ft. high N. of cor.

Land level. Soil 1st rate.

Timber, aspen, willow and spruce.

May 13, 1905: As Polaris will soon be invisible on account of continous daylight, I examine the adjustments of the transit, then to test the adjustments of 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: I set my transit on secant 6.27 ft. S. of cor. of T 1 N Rs. 1 and 2 E. At 4h p.m. l.m.t. I set off 61° 48' N. on the lat. arc. 18° 27' N. on the decl. arc. and mark the meridian thus determined with the solar by a cross on a stone firmly set in the ground 2.00 chs. N. of the instrument. At 10h p.m. l.m.t I begin to observe Polaris in accordance with instructions on Page 96 of the manual and determine the meridian, which conincides with the meridian obtained by the solar.

May 13, 1905.

Chains. May 15, 1905: At 7h a.m. l.m.t. I set off 61° 48' N. on the lat. arc. 18° 51' N. on the decl. arc. and determine the meridian which also coincides with the ones determined May 13; therefore I conclude the adjustments of the solar apparatus are correct. I measure the angle between the meridian thus established and the secant S. of sec. 36 and find it to be 89° 55' , making its direction S. 89° 55' E. which it should be. Thence I run,

N 89° 55'. E. on secant S. of sec. 31.

Over rolling land, through scattering timber.

6.50 West edge of meadow, bears N. and S.

13.00 East edge of meadow, bears N. and S.

17.14 Top of high bluff, bears N. 10° W. and S. 40° E. Desc. abruptly through heavy timber. 300 ft. in elev.

33.00 Foot of abrupt descent. Bears N. 10° W. and S. 40° E. Desc. more gradually.

No difference in measurement between the two sets of chainmen.

40.00 N. 2.83 ft. from secant.

Set a lavastone 18 X 8 X 6 ins. 12 ins. in the ground for standard 1/4 sec. cor. marked S C 1/4 on N. face, from which

A spruce 6 ins. diam. bears N. 17° 50' W. 13 lks. dist. marked S C 1/4 S 31 B T .

A spruce 6 ins. diam. bears N. 63° 05' E. 11 lks. dist. marked S C 1/4 S 31 B T .

No difference in measurement between the two sets of chainmen.

80.00 Set a lavastone 14 X 8 X 6 ins. 10 ins. in the ground for standard cor. of secs. 31 and 32 marked S C on N., with 1 groove on W., and 5 grooves on E. face, from which,

A spruce 9 ins. diam. bears N. 31° 40' E. 24 lks. dist. marked T 1 N R 2 E S 32 B T .

A spruce 10 ins. diam. bears N. 76° 10' W. 7 lks. dist. marked T 1 N R 2 E S 31 B T .

Land level and mountainous.

Soil, 1st to 4th rate.

Timber, spruce.

Chains. N. 89° 57' E. on secant through sec. 32

Over bottom land through heavy timber.

36.00 Right bank of Copper River, bears N. 30° W. and S. 30° E.

S. 1.97 ft. from secant.

Set a lavastone 16 X 10 X 8 ins. 12 ins. in the ground for meander cor. on S. boundary of sec. 32, ~~marked S C T 1 N on N., M C on E., R 2 E on W., faces,~~ from which, See corrected notes page

A spruce 16 ins. diam. bears N. 64° 30' W. 20 lks. dist. marked S C M C T 1 N R 2 E S 32 B T .

A spruce 18 ins. diam. bears N. 25° W. 66 lks. dist. marked S C M C T 1 N R 2 E S 32 B T .

36.82 Point for triangulation on secant.

To determine the dist. across the river, I set a point on the E. side of the main channel, from which I establish a base S. 18° 58' E. 10.00 chs. dist. to a flag from which the point on the right bank bears N. 76° 01' W. I measure each angle and find them to be respectively 14° 02', 108° 55' and 57° 03' their sum being 180° I compute the dist. as follows:

$$\frac{\text{Sin } 57° 03'}{\text{Sin } 14° 02'} \text{ X Base or } \frac{.8391 \text{ X } 10.00}{.2425} = 34.60 \text{ chs.}$$

Also 36.82 + 34.60 = 71.42 chs.

37.00 Foot of bank, 20 ft. high and edge of water, bears N. 30° W. and S. 30° E.

No difference in measurement between the two sets of chainmen.

40.00 The 1/4 sec. cor. falls in river channel.

68.40 East edge of channel, bears S. 45° E. and N.45° W.

71.42 Triangulation point stands upon a gravel bar at the junction of the Copper River and the Dadina River. The Copper River at this point flows S.45° E.

79.00 Center of channel of Dadina River, flows S.70° W. into the Copper River.

No difference in measurement between the two sets of chainmen.

80.00 The standard cor. of secs. 32 and 33, falls in the bed of river.

Land level. Soil 1st and 4th rate.

Timber, spruce, and alder.

Chains. N. 89° 58' E. on secant through sec. 33.

Over bed of river.

3.60 Left bank of Dadina River, bears N. 70° E. and S. 70° W. Bank of river 4 ft. high

4.00 S. 3.77 ft. from secant.

Set a lavastone 14 X 8 X 6 ins. 10 ins. in the ground for meander cor. on S. boundary of sec. 33 ~~marked S C T 1 N on N., M C on W., and R 2 E on E.,~~ ~~faces~~ from which, See corrected notes page 19

A spruce 12 ins. diam. bears N. 22° 10' W. 49 lks. dist. marked S C M C T 1 N R 2 E S 33 B T .

A spruce 8 ins. diam. bears North 10 lks. dist. marked S C M C T 1 N R 2 E S 33 B T .

Through thick heavy spruce timber, over bottom land.

No difference in measurement between the two sets of chainmen.

40.00 S. 4.70 ft. from secant.

Set a granitestone 16 X 10 X 6 ins. 12 ins. in the ground for standard 1/4 sec. cor. marked S C 1/4 on N. face, from which,

A spruce 10 ins. diam. bears N. 57° 15' W. 45 lks. dist. marked S C 1/4 S 33 B T .

A spruce 10 ins. diam. bears N. 16° 15' E. 41 lks. dist. marked S C 1/4 S 33 B T .

No difference in measurement between the two sets of chainmen.

80.00 S. 5.01 ft. from secant.

Set a lavastone 15 X 9 X 8 ins. 10 ins. in the ground for standard cor. of secs. 33 and 34 marked S C on N., with 3 grooves on E., and W., faces, from which,

A spruce 8 ins. diam. bears N. 22° 15' W. 42 lks. dist. marked T 1 N R 2 E S 33 B T .

A spruce 7 ins. diam. bears N. 11° 50' E. 24 lks. dist. marked T 1 N R 2 E S 34 B T .

Land level. Soil, 1st rate.

Timber, heavy spruce.

May 15, 1905.

Note: The evening was cloudy and Polaris invisible.

Chains. East on secant through sec. 34.

Over level bottom land, through heavy timber.

No difference in measurement between the two sets of chainmen.

40.00 S. 4.70 ft. from secant.

Set a granitestone 12 X 12 X 10 ins. 8 ins. in the ground for standard 1/4 sec. cor. marked S C 1/4 on N. face, from which

A spruce 10 ins. diam. bears N. 57° W. 18 lks. dist. marked S C 1/4 S 34 B T .

A spruce 13 ins. diam. bears N. 58° 30' E. 46 lks. dist. marked S C 1/4 S 34 B T .

52.00 Enter willow flat, bears N. and S.

57.00 Center of creek 10 lks. wide, 2 ft. deep, flows S. 25° W. Asc. gradually.

75.00 Foot of bluff, 34° 50' slope, bears N. W. and S. E. Clay soil.

S. 3.76 ft. from secant

Set a lavastone 12 X 10 X 10 ins. 8 ins. in the ground for witness cor. to standard cor. for secs. 34 and 35, marked W C S C on N., with 4 grooves on W. and 2 grooves on E. face, from which,

A spruce 18 ins. diam. bears N. 26° 40' W. 30 lks. dist. marked W C S.C. T 1 N R 2 E S 34 B T .

A spruce 18 ins. diam. bears N. 51° 45' E. 80 lks. dist. marked W C S C T 1 N R 2 E S 34 B T .

No difference in measurement between the two sets of chainmen.

80.00 Point for standard cor. of secs. 34 and 35 falls on very steep slope of clay bluff and is impracticable to set the cor. stone.

Land level and mountainous

Soil, 1st and 2nd rate.

Timber, spruce, willow and aspen.

S. 89° 58' E. on sedant through sec. 35.

Asc. abruptly over bluff.

2.00 Spur of bluff, bears N. E. and S. W. Thence along steep side of bluff, facing S.

5.00 A gulley , drains S. W. asc. abruptly.

Chains.

10.24 Top of bluff, 300 ft. above river bottom, bears N. and S.

Over level land, enter dense brush, bears N. and S.

No difference in measurement between the two sets of chainmen.

40.00 S. 2.19 ft. from secant.

Set a lavastone 12 X 10 X 10 ins. 8 ins. in the ground for standard 1/4 sec. cor. marked S C 1/4 on N. face, from which,

A spruce 10 ins. diam. bears N. 11° 20' W. 43 lks. dist. marked S C 1/4 S 35 B T .

A spruce 14 ins. diam. bears N. 61° 40' E. 31 lks. dist. marked S C 1/4 S 35 B T .

Enter heavy cottonwood and spruce.

No difference in measurement between the two sets of chainmen.

80.00 Set a granitestone 12 X 10 X 10 ins. 8 ins. in the ground for standard cor. of secs. 35 and 36 marked S C on N., with 5 grooves on W. and 1 groove on E. face, from which,

A spruce 5 ins. diam. bears N. 6° 10' E. 56 lks. dist. marked T 1 N R 2 E S 36 B T .

A spruce 8 ins. diam. bears N. 37° 30' W. 143 lks. dist. marked T 1 N R 2 E S 35 B T .

Land level to mountainous.

Soil, 1st to 4th rate.

Timber, spruce, cottonwood and willow.

S. 89° 56' E. on secant S. of sec. 36.

Over rolling land, through heavy timber.

No difference in measurement between the two sets of chainmen.

40.00 N. 2.83 ft. from secant.

Set a granitestone 14 X 12 X 10 ins. 9 ins. in the ground for standard 1/4 sec. cor. marked S C 1/4 on N. face, from which,

A spruce 6 ins. diam. bears N. 45° 15' E. 26 lks. dist. marked S C 1/4 S 36 B T .

A spruce 8 ins. diam. bears N. 34° W. 18 lks. dist. marked S C 1/4 S 36 B T .

Chains. No difference in measurement between the two sets of chainmen.

80.00 N. 6.27 ft. from secant.

Set a granitestone 18 X 8 X 6 ins. 12 ins. in the ground for standard cor. for Tp. 1 N. Rs. 2 and 3 E., marked S C T 1 N on N., R 3 E on E., and R 2 E on W., with 6 grooves on N., E., and W. faces, from which,

A spruce 18 ins. diam. bears N. 23° 40' E. 25 lks. dist. marked T 1 N R 3 E S 31 B T .

A spruce 12 ins. diam. bears N. 73° 20' W. 41 lks. dist. marked T 1 N R 2 E S 36 B T .

Land level and rolling.

Soil, 1st rate.

Timber, spruce, cottonwood and willow.

May 16, 1905.

May 17,1905: As Polaris is no longer visible on account of insufficient darkness, in order to test my course last run;at 8 h a.m. l.m.t. I set off 61° 48' N. on the lat. arc. 19° 19' N. on the decl. arc. and determine the meridian with the solar at my station 6.27 ft. S. of the Tp. cor. I set the telescope in a course N. 89° 55' W. and it coincides with the flag set on the secant 10.00 chs. W. of my station; therefore I deem the base line satisfactorily established.

May 18, 1905: In order to test the solar apparatus by comparing the results of observations on the sun made during a.m. and p.m. hours with the true meridian determined by observations on Polaris I return to the cor. of Tp. 1 N., Rs. 1 and 2 E. I set the transit on the meridian established at this point on May 13 heretofore described. At 3h p.m. l.m.t. I set off 61° 48' N. on the lat. arc. 19° 36' N. on the decl. arc. and determine the meridian which coincides with the true meridian before described.

May 19, 1905: At 7h a.m. l.m.t. I set off 61° 48' N. on the lat. arc. 19° 45' N. on the decl. arc. and determine the meridian with the solar which also coincides with the true meridian before described;

Chains therefore I conclude the adjustments of the solar have remained satisfactory.

May 19, 1905.

General Description.

Through R. 1 W. this line runs over the Northermost spur of Stuck Mountain. The land all slopes to the North. The land South of the line is mountainous and 4th rate, but the land North of the line is level for the most part and 1st rate. The soil is generally clay with a few stones scattered over the country.

Through Rs. 1 and 2 E. the line runs over valley land, most of which is 1st rate. The ground is covered everywhere with a thick bed of lichen and moss except where the timber has been burned, and in these burned places red-top and bunch grass grows luxuriously.

Alfred B. Lewis.
U. S. Deputy Surveyor.

Supplemental Field Notes

Principal - Base Line

Chains The standard 1/4 section corner on south boundary of Sec. 36,T.1 N.,R.1 W.is set 12 ins.in the ground and mound of stone.

Topography on south side of Sec.34,T.1 N.,R.1 E.

11.50 Center of Willow Creek 10 lks.wide flows S.80 E. Enter Timber.

12.00 J.Binghams tent and log stable bears N.7° 30'W. 11 Chains distant.

12.85 Intersect Willow Creek,bears S.80 W.and flows easterly along line.

13.00 The U.S.Military wagon road and telegraph line bears N.and S.

Along south side of J.Binghams clearing.

14.40 Leave Willow Creek which flows SE.

20.00 East edge of J.Binghams clearing,etc.

The meander corner on south side sec.32 T.1 N. R.2 E.on right bank of Copper River I mark M C on E.,S C T 1 N S 32 on N.,and R 2 E on W.faces.

The meander corner on south side sec.33,T.1 N. R.~~1~~ 2 E.on left bank of Dadina River I mark M C on W.S C T 1 N S 33 on N.and R.2 E on E.faces.

[illegible]

RECEIVED
S. G. O.
OCT 9 1907
ANSWERED

Notes of Corrections of the
Copper River Base Line
Principal Meridian
Thirty Standard Parallel North and
Third Guide Meridian East.

PRELIMINARY OATHS OF ASSISTANTS.

I ~~We~~, S. C. Lewis

do solemnly swear that ~~we~~ I will well and faithfully execute the dutes of Chainmen; that ~~we~~ I will level the chain upon even and uneven ground, and plumb the tally pins, either by sticking or dropping the same; that ~~we~~ I will report the true distances to all notable objects, and the true lengths of all lines that ~~we~~ I assist in measuring, to the best of ~~our~~ my skill and ability, and in accordance with instructions given ~~us~~ me in the survey of ~~a tract of land claimed by~~ The Copper River Base Line, Principal Meridian, Third Standard Parallel North, and Third Guide Meridian East ~~and known as Survey No.~~ ~~under the Act of Congress, approved~~, in the District of Alaska.

S C Lewis Chainman.

Chainman.

Subscribed and sworn to before me October

this ~~Second~~ 1st day of ~~September~~, 1907.

J H Murray
Notary Public
[SEAL.]

Alfred B. Lewis
U S Deputy Surveyor.

do solemnly swear that will well and truly perform the duties of Axmen in the establishment of corners and other duties, according to instructions given us and to the best of skill and ability, in the survey of a tract of land claimed by

and known as Survey No. under the Act of Congress approved, in the District of Alaska.

Axman.

Axman.

Subscribed and sworn to before me

this day of, 190.

[SEAL.]

do solemnly swear that will well and truly perform the duties of Flagmen, according to instructions given, to the best of skill and ability, in the survey of a tract of land claimed by

and known as Survey No. under the Act of Congress approved in the District of Alaska.

Flagman.

Flagman.

Subscribed and sworn to before me

this day of, 190.

[SEAL.]

FINAL OATHS OF ASSISTANTS.

LIST OF NAMES.

A list of the names of the individuals employed by Alfred B Lewis 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 a ~~tract of land claimed by~~ Copper River Base Line, Principal Meridian, Third Standard Parallel North and Third Guide Meridian East. ~~and known as Survey No.~~ ~~under the Act of Congress approved~~ in the District of Alaska, showing the respective capacities in which ~~they~~ he acted.

S. C. Lewis ..... Chainman.

..... Chainman.

..... Axman.

..... Axman.

..... Flagman.

..... Flagman.

FINAL OATHS OF ASSISTANTS.

~~We~~ I hereby certify that ~~we~~ I assisted Alfred B Lewis United States deputy surveyor, in surveying the ~~tract of land claimed by~~ Copper River Base Line, Principal Meridian, Third Standard Parallel North and Third Guide Meridian East ~~and known as Survey No.~~ ....., which is represented in the foregoing field notes as having been surveyed by him and under his directions; and that said survey has been in all respects, to the best of ~~our~~ my knowledge and belief, well and faithfully surveyed, and the corner monuments established according to the instructions furnished by the United States Surveyor General for Alaska.

S. C. Lewis ..... Chainman.

..... Chainman.

..... Axman.

..... Axman.

..... Flagman.

..... Flagman.

Subscribed and sworn to before me this ~~twenty third~~ 12 day of ~~September~~ October 1907.

[SEAL]

J. H. Murray
Notary Public

Alfred B. Lewis
U. S. Deputy Surveyor.

I, Alfred B. Lewis, United States Deputy Surveyor, do solemnly swear that the attached supplemental field notes of the survey of the Copper River Base line, Principal Meridian, Third Standard Parallel North and the Third Guide Meridian East, are true and correct, and are a part of the field notes filed by me under Contract No 3.

Alfred B. Lewis,
U.S. Dep. Surveyor.

Subscribed and sworn to before me this twenty sixth day of September 1907

Edward J. Stier
Clerk, U. S. District Court, for the District of Alaska, Third Division.

By S. A. Crandall, Deputy

FINAL OATHS OF DEPUTY SURVEYOR AND HIS ASSISTANTS.

LIST OF NAMES.

A list of the names of the individuals employed by Alfred B. Lewis, 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 Principal Base, through Ranges Nos. 1 W. and 1 and 2 E. of the Copper River Base and Meridian, in the District of Alaska. showing the respective capacities in which they acted:

F. C. Bruce, Paul Drake, Chainman.
J. O. Drake, Dan W. Sheehan, Chainman.
S. C. Lewis, Moundman.
, Moundman.
W. H. Johnston, Axman.
Dan W. Sheehan, Axman.
Fred Bruce, Flagman.

FINAL OATH OF ASSISTANTS.

We hereby certify that we assisted Alfred B. Lewis, United States Deputy Surveyor, in surveying all those parts or portions of the Principal Base, through Ranges Nos. 1 West and 1 and 2 East of the Copper River Base and Meridian in the District of Alaska, of the meridian, of , 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

Fred Bruce, Paul Drake, Chainman.
J. O. Drake, Daniel W. Sheehan, Chainman.
S. C. Lewis, Moundman.
, Moundman.
W. H. Johnston, Axman.
Daniel W. Sheehan, Axman.
Fred Bruce, Flagman.

Subscribed and sworn to before me this 30th day of September 1905, ~~189~~

SEAL

John Byrne
U.S. Commissioner for Alaska

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FINAL OATH OF UNITED STATES DEPUTY SURVEYOR.

I, Alfred B. Lewis, United States Deputy Surveyor, do solemnly swear that, in pursuance of a contract received from Wm L. Destin United States Surveyor General for Alaska, bearing date of the twenty-first day of March 1904, 189 , 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 Alaska, the Manual of Surveying Instructions, and the laws of the United States, surveyed all those parts or portions of the Principal Base, through Ranges Nos. 1. West and 1 and 2 East of the Copper River Base and Meridian

~~of the~~

~~meridian, in the~~ ~~of~~ ~~,~~ 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 Alaska and in the specific manner described in the field notes, and that the foregoing are the original field notes of such survey; and should any fraud be detected, I will suffer the penalty of perjury under the provisions of an Act of Congress approved August 8, 1846.

Alfred B. Lewis.
United States Deputy Surveyor.

Subscribed by said Alfred B. Lewis, and sworn to before me this 30 day of September 1905, ~~189~~

John Lyons
U.S. Commissioner for Alaska

SEAL

APPROVAL.

OFFICE OF THE UNITED STATES SURVEYOR GENERAL,
Juneau, Alaska,
January 28, 1908, ~~189~~

The foregoing field notes of the survey of the Principal Base, through Ranges Nos. 1 West and 1 and 2 East, of the Copper River Base and Meridian in the District of Alaska

executed by Alfred B. Lewis under his contract No. 3, dated March 21, 1904, ~~189~~, having been critically examined, and the necessary corrections and explanations made, the said field notes, and the surveys they describe, are hereby approved.

Wm L. Destin
~~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.

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