



Oakland Alameda Co. Cal.

December 29th 1865.

To the

Hon. James M. Edmunds,
Commissioner of General Land Office.

Sir:

I have the honor to transmit to your office this book (Copy No. 1.) of Observations, Reductions, Discussion of Final Results and Field Notes, being an authentic report of the proceedings attending the location, survey and demarcation of the Oregon^{and} Washington boundary between the Columbia & Snake Rivers.

Very respectfully submitted
David G. Major,
Astronomer & Surveyor

75th mile

Affidavits.

I, Frederick G. Hesse, Astronomer do solemnly swear that I made & reduced the principal series of observations taken on Cottonwood Creek Oregon during the months of November & December 1863, and that every care and diligence was used in the field for the correct determination of the 46th parallel of North latitude, I further certify to the best of my knowledge & belief that the requirements of the contract entered into between the Honorable Commissioner of the General Land Office & D. G. Major dated Washington D. C. April 25th 1863, with regard to the number & character of the astronomical observations have been more than complied with.

F. G. Hesse.

Subscribed by said Frederick G. Hesse, astronomer and sworn to before me a Justice of the Peace for the County of Alameda in the State of California this 29th day of December 1865.

Geo. H. Fogg,
Justice of the Peace

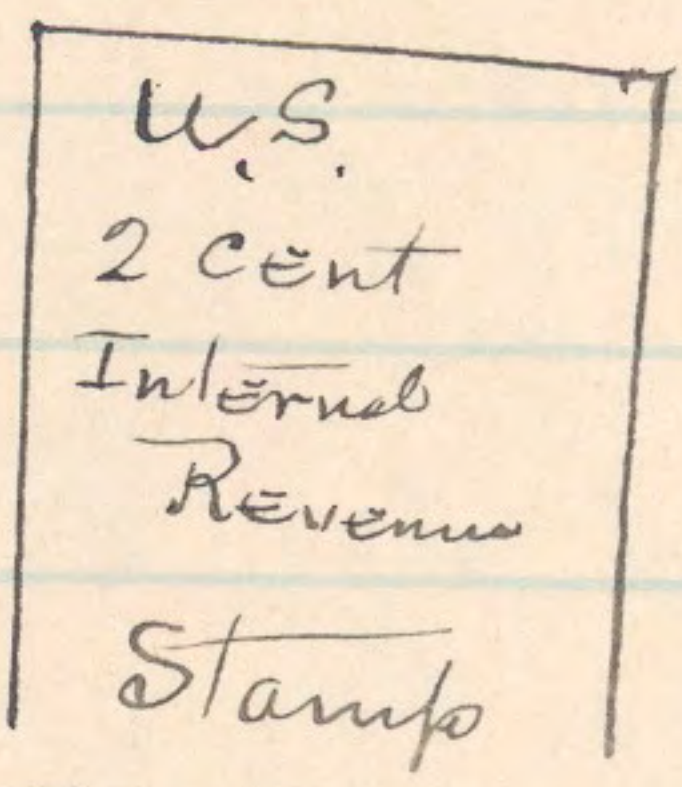
2 Cent
U.S.
Int. Revenue
Stamp

I, John Major, do hereby certify that I have assisted D. G. Major astronomer & Surveyor, to determine and mark the 46th parallel of latitude between the Columbia & Snake Rivers and to the best of my knowledge & belief the boundary has been well determined and surveyed and substantial monuments built at the termination of each mile, and half mile from the Columbia River to Mill Creek in Blue Mountains. I do further certify that it was impracticable to chain and establish mile monuments through the Blue Mountains, but the boundary line has been faithfully marked by cuttings through timber, blazing & marking trees and building durable monuments of stone, on the prominent ridges and important points throughout

the whole distance to Snake River,
John Major.

Subscribed by said John Major & Brown to
before me a Justice of the Peace for the
County of Plameda in the State of
California, this 29th day of December 1865,

Geo. H. Fogg,
Justice of the Peace.



I Daniel G. Major, Astronomer and
Surveyor, do solemnly swear, that I
have truly, faithfully and impartially
executed to the best of my skill and
ability, the observations, calculations, &
surveys mentioned in the Contract
entered into on the 25th of April 1863,
between James M. Edmunds, Commissioner
of the General Land Office & myself;
so far as it was possible to carry out
the spirit & letter of 'Instructions' forming
a portion of said Contract, and I further
swear that I made and caused to be
made more than double the number of
observations agreed upon, in order to get
the most reliable results for Latitude;
that the measurements and chainings were
carefully made, and in ^{all} cases of doubt,
repeated. Deeply marked, durable posts
were erected in every instance, where
they were to be had, without regard to
the expenses incurred or labor expended.

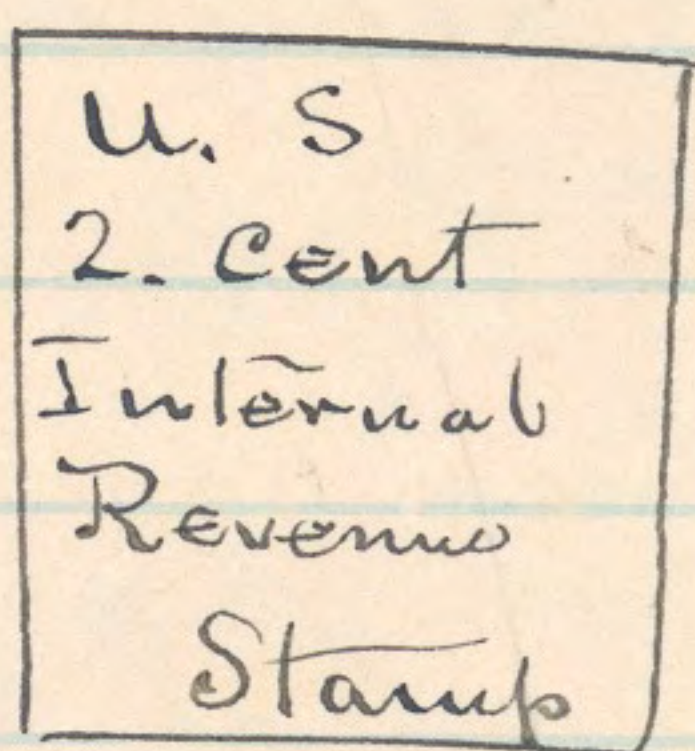
The monuments were all of larger
size than were required by the terms
of the Contract. After putting in monuments
to the 42nd mile, it was not possible to
continue accurate measurements with
the chain, nor to erect monuments at
the end of each mile; but they were
erected, as the field notes show, on all
prominent ridges &c. I hereby certify

that this is a correct report of the observations, Calculations, & Field notes; & further, that I have suffered heavy loss pecuniarily, in the faithful execution of the terms of the agreement aforementioned over and above the amount of \$4,500 due me by terms of said agreement. All the duties of this Survey except portions of the astronomical series at First Station, were performed by myself in person.

Daniel G. Major,
Astronomer & Surveyor.

Subscribed by said D. G. Major, astronomer & Surveyor and sworn to before me a Justice of the Peace, for the County of Alameda in the State of California this 29th day of December 1865,

Jos. H. Fogg,
Justice of the Peace



A List of the names of persons assisting in the location survey & marking of the Oregon and Washington boundary between the Columbia and Snake Rivers.

Daniel G. Major	Astronomer & Surveyor
Frederic G. Hesse	Observer at First Station
P. C. Hannay	Recorder " "
John Major	Superintendent of monuments
George Perrin	Chairman
Henry Bays	"
M. Manning	"
William Henry	Assessor
William Haws	Flagman
Mr Wood	"

I, George H. Perrin do solemnly swear that I have faithfully executed the duties of Chairman in the survey just completed by Daniel G. Major U.S. Astronomer & Surveyor of the boundary between Oregon & Washington Territory that the chain was levelled on uneven ground, that the tally pins were plumbed; that the true distance was reported to all notable objects to the best of my skill & ability, and I do hereby certify that the said boundary line has to the best of my knowledge & belief been well & faithfully surveyed and boundary monuments & posts marked & planted according to instructions.

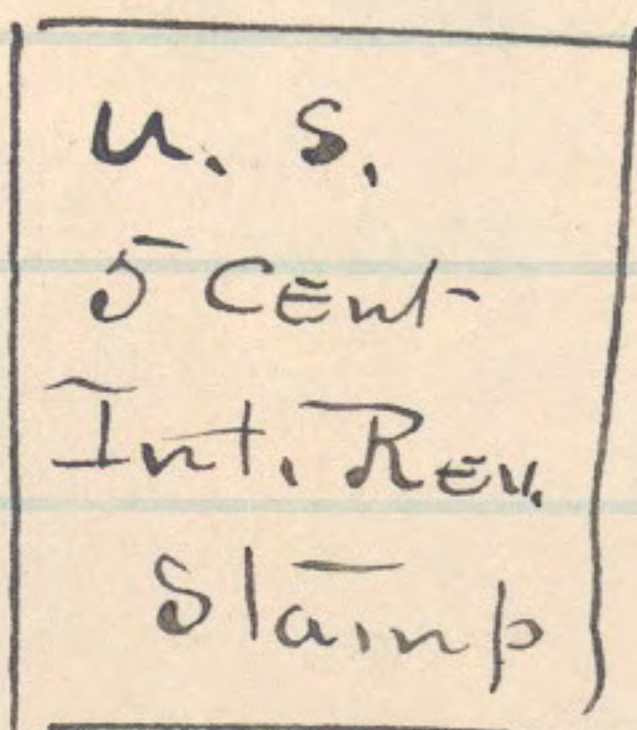
Geo. H. Perrin
Chairman.

Subscribed & sworn to by the above named party before me, a Notary Public for the County of Walla Walla in the Territory of Washington.

Chas. A. White

September 26th 1864

Notary Public of Wash. Terr. and
County Surveyor of Walla Walla
County W. T.



6
Field Notes

of
Survey of Oregon and Washington
Boundary from the Columbia
to
Inash Rivers.

- 1863
November 17 Established astronomical Camp on the North East branch of Cottonwood Creek, foot of the Blue mountains, and began observations for the determination of the 46th parallel of latitude.
- December 12, Completed the series of observations and determined the position of Camp to be $45^{\circ} 59' 26''.5$ dependent upon the results from the reduction and discussion of 228 observations of Circum-polar and Circum-meridian Stars, for latitude, 159 independent altitudes of Stars near the prime vertical for time; 80 measurements of suns diameter &c. for instrumental corrections, also the necessary observations for refraction and elevation above mean sea level.
- December 14 Compared two-pole chain of thirty three feet length and consisting of 50 links with Standard Chains, the latter being used throughout the whole survey, only for comparisons measured north from Camp of observation 116 Chains of 33 feet each. Ran west on tangent to parallel several miles until interrupted by heavy snows and intense cold weather; the thermometer for many days marking 10° to 15° below zero F^h.
- 1864
March 2 The weather having moderated, began to mark off the tangent to 46th parallel (at the intersection of North and South line between Ranges 36 and 37, East of Willamette Meridian) and the approximate boundary line, dependent upon the above written results, prolonging this tangent, on the 6th of May I reached the Columbia River. Length of tangent 35 miles, equal to a Southern departure from the 46th

parallel at the Columbia River of 12.90 Chains of 66 feet, consequently ran due north 12.90 Chains or 283.8 yards and set temporary stakes near the east bank of the Columbia River as the 46th parallel of latitude from the determination of Astronomical Station first, Cottonwood Creek Oregon

1864
May 7th

2nd Astronomical Station:
Encamped on east bank of Columbia River at the foot of Cathedral rock which is about 400 feet high, almost perpendicular, and has a stone slide; near also road to Wallula distant about 6 miles situated also 1/2 of a mile S. S. W. of mouth of big Canon coursing east

May 20

The position of this station is dependent upon the results of 352 observations for latitude, 107 altitudes for time, 67 measurements of suns diameter for instrumental corrections, and 26 readings for refraction and elevation above mean sea level.

Magnetic declination 20° 20' East. The Compass needle was rather sluggish and non sensitive and although this determination does not merit full confidence is correct for all practical purposes.

May 23,

Final result for latitude of this station 46° 00' 33" 6. The boundary would therefore be south 33" 6 equal to 51.5 Chains of 66 feet which distance was measured and temporarily marked as the 46th parallel according to the observations at station second.

The difference between the two determinations of the 46th parallel as resulting from the Cottonwood series station 1st prolonged to Columbia River and the Columbia River series station 2nd was four seconds combining both series the most probable determination is obtained by equations of condition

vide pages 133 to 137.

The initial point of the boundary being thus determined is dependent upon the results of 580 observations for latitude and over 250 altitudes for time. All necessary measurements and examinations being made to correct instrumental errors and personal equations.

The objects were so selected that any imperfection in measurement or unknown error in instrument if not entirely eliminated would produce at most a minimum effect.

Initial Monument of the Boundary between Oregon and Washington

1864

May 23

The position selected for this monument is a slightly elevated bench rising from the rocky bank of Columbia River which bears S. W. and is a mile wide having two channels, the main one being 20 chains from the east bank & 27 Chs. from the initial monument.

With regard to the Public Land Surveys the monument is situated 74 chains east of "Guide Meridian" on line north and south between ranges 30 and 31 east of Willamette Meridian; also 202 chains south of east and west line between townships 6 and 7 north:

Measurements having been made from Range line 31 & 32 to Guide Meridian 30 & 31, in one chain and 50 links west of monument the line crosses the old emigrant road to the Falls and in seven chains enters the Columbia River.

The following bearings were noted

Pl. 30431

32
Cut Characters on north face "VV"
on south "O" on the east "46 L 1864" and
1864 on the west "17 M" Threw up an earth
June 6 mound 8 feet square at base and 4 feet
high tapering to post. Earth packed & sodded.

17 M Dug quadrangular trench 1 foot from
exterior base line of mound, 2 spades
wide & 18 inches deep, also dug 4
pits corresponding to Cardinal points
of mound.

S 13-18 Thence the line follows along foot of
small hill 9.50 Chains to
intersection of north & south line
between ranges 33-34 E. and section
13-18. Planted section post properly
marked. Built mound, dug pits &c.

Thence over flats and small ridges
the 40 Chains terminates on slight
declivity to north.

Bearings to top of rocky ledge S 35° 27' E.
Distance 3 miles to top of rocky ledge
S 39° 56' W. Distance 4 miles, made
excavation 2 1/2 feet deep, deposited
Charcoal & a quantity of bones.

1/2 M Planted post 6 feet long & 4 inches
square, marked on West side "1/2 M"
post a poplar.

Threw up a mound of earth 6
feet square at base & 3 feet high.
Sodded.

Dug trenches and pits of the usual
size. Crossing ridge and overpoor
sandy and alkali soil, the rocks
ends on east decline on land covered
with sage brush. Bearings to Chimney
on J. B. Goodmans house N 81° 17' E.
distance 60 Chains. Groves of timber
in mountain gorge S 42° 26' E. distance
16 miles, to head of ravine S 16° 09' W
distance 7 miles. Made excavation 3
feet deep, deposited a quantity of
Charcoal. Erected a heavy Cottonwood

post 8 feet long & 8 inches square. Top bevelled, upper end trimmed. Ground end charred. Marked in deeply cut letters as usual on north face "W"

18 M. On the south "O" on the east "46 T. 1864", and on the west "18 M."

Built a mound of earth 8 feet square at base & 4 feet high tapering to post in center.

Dug deep trench & pits, Mounds well packed & sodded.

Proceeding east in 5 chains line across wagon road & trails course N. N. W. in 7 chains intersects north & south section line between 18-17

S 18-17 Made excavation, deposited Charred stave, Planted poplar section post properly marked.

Erected mound of earth dug pits & Bearings: to door of Mr. Goodman's house N 80° 18' E. distance 55 chains to door of Mr. Rice's house S 65° 34' E. distance

1864 3/4 mile to projecting ledge of rock S 69° 34' N. Distance June 7 4 miles to ridge of Mr. Mann's new house.

N 45° 26' W distance 2 miles 3 chains distant a grove of young poplars 9 chains across Pine Creek a deep rapid stream 18 lewis wide and bearing north, cause bluff: some brush along its sides.

Hence through rich bottom land 49 chains ends in Goodman's claim and alongside his ditch.

Made excavation. Deposited bones & Charcoal. Planted poplar post 6 feet long & 4 inches square marked on west side 1/2 m erected mound 5 feet square & 4 feet high, tapering to post. Dug deep trench on 3 sides, the ditch is on the 4th & north side. Dug pits except on north side. Bearing to Mr. Rice Chimney S 45° 28' E. distance 1/3 mile to Mr.

1/2 M

Goodmans Chimney N 33° 30' E
 Distance 10 Chains to Mr Mann's new
 house N 53° 34' W, distance 2 1/3 miles
 to rock projecting from ridge S 70° 57' W
 distance 4 1/2 miles, thence east over low
 flat bottom with some aestival patches
 70 Chains ascend bluff 40 feet thence
 along flat sandy plain covered with
 sage brush, soil alkaloid, 80 chains
 made excavation 3 feet deep, deposited
 corn & burnt stalks, Planted a Cottonwood
 post 8 feet long & 8 inches square
 top bevelled, marking on north side "N"

19 M on south "O" on east "46 L 1864" on west
 "19 M". Built mound 8 feet square and
 4 feet high, Earth packed & sodded
 Dug deep quadrangular ditch 8 1/2 feet
 A wagon road bears N. W. dist. 15
 miles, also another, south 60 miles

Thence line passes through sparse
 sage brush and descends decline to
 E. at 650 Chains, intersects section line
 16-17 T. 6 N. R. 34 E.

S 16-17 Bearings: to door of John Rich's house
 S 76° 28' E distance 60 Chains, Timber
 on mountain peak N 78° 22' E, distance
 25 miles to rock on mountain ridge
 S 52° 06' W.

Erected a Cottonwood section post of
 proper size & marking, Built mound, dug pits &c

The boundary passes into a rampy
 edge of hollow, covered to north with
 brush, thence into enclosed claim of
 John Rich, 40 Chains ends in ramp

1/2 M Bearings to high mountain peak in
 Blue Mountains N 78° 13' E, distance
 about 30 miles, to decline of timber
 ridge in Blue Mts, S 66° 43' E, distance
 25 M, to door of John Rich's log house

1864
 June 8 S 36° 50' W, distance 9 Chains to
 mountain peak west of Columbian
 River N 75° 09' W, distance 45 miles

Made excavation, deposited cones of
 Corro lead. Erected a six foot
 Cottonwood post, marked on west side
 "1/2 M". Built mound 4 feet square
 & 4 feet high tapering to post.
 Dug trenches and pits. Land swampy
 Soil rich black bottom land.

20 M.

The boundary line passes up through
 swampy ground to grove of small
 poplars at 79 Chains enter timber,
 80 chains ends in grove. Could get
 no bearings, marked 3 poplars, 4 inches
 in diameter and close to the boundary
 with letter "O" blank and marked with
 "W" a poplar N. E. and another in like
 manner N. W. from end of mile.

Could not build mound or dig trench
 owing to swamp. A log house in
 South East direction, distant 15 Chains
 thence through dense undergrowth
 and swamp in 670 Chains, intersect
 north & south line between

S 15-16

sections 16-15, marked a poplar tree
 for section corner. Threw up a
 mound about it. Soil too swampy
 for trench & pits. Along through narrow
 bed of swamp to end of 40 Chains
 situated on north edge.

1/2 M

Made excavation, deposited cones.
 Planted Cottonwood post 6 feet
 long & 4 inches diameter, marked west
 face "1/2 M". Built mound with trench
 & pits like the other half mile
 monuments. Position too low to get
 any bearings. Thence boundary passes
 along north edge of swamp and
 foot of gentle rise to north

The mile terminates on edge of
 wagon road, from Walla Walla to
 to Pine Creek. Mound erected in
 flat near gradual rise to N & N. E.
 Made excavation 3 feet deep, deposited

21 M

Charred stakes: Erected post, Cottonwood
8 feet long & 8 inches square, Marked on
north face "W" on the south "O" on the
east "46 L 1864", and on the west "21" M.

Quiet mound of earth, 8 feet square &
4 feet high. Earth well packed and
oddish.

Dug deep trenches & pits as usual.

Bearings: to well defined gap in Mts.,
S 59° 26' E. dist. 35 m. to mound covered
with small brush, on Mth range
S 24° 51' N.

S 14-15

distance 6 miles, Ascend over gradual
rise 640 Chains to intersection of north
& south line between sections 14-15

T. 6. N. R. 34 E. situated about midway on

1864

slope of hill declining to S. S. M.

June 9

Deposited a yellow stone 5 inches in
diameter. Planted a Cottonwood post of
prescribed size & marking.

Quiet mound, dug pits &c.

Bearings: to well defined mountain
gap S 59° 20' E. distance 35 miles. to
middle point between 2. S. W. Cottonwood
trees in small grove S 61° 18' E. distance
4 miles, to log house S 86° 57' W. distance
1 mile. Thence ascend & enter upon
rolling prairie ridges the

1/2 M

40 Chains ends on top of ridge bearing
E. N. E.

Bearings: to well defined mountain gap
S 58° 58' E. distance 34 3/4 miles to small
mountain peak near Columbia River
N 78° 47' W. distance 17 miles to mountain
peak with timber N 79° 26' E. distance
28 miles. to house S 52° 14' W. distance
3 1/2 miles.

Made excavation. Deposited
Charred stake. Erected a 6 foot Alder
post 4 inches diameter. Marked on
west side "1/2 M". Quiet mound, dug
trench & pits &c. Similar to the

usual half mile monuments.

Thence the boundary line crosses ravine & traverses several small ill defined ridges at 77 Chains Cross trail. 80 Chains terminates on slope of small hill descending to the south & S. S. W. Bearings to two trees on bare mountain ridge S 33° 11' E.

22 M.

Point in which distant mountain ridge is shut out by near hill N. 81° 05' W to similar point S. 83° 43' W. Made excavation, deposited Charred Stakes; planted Cottonwood post 8 feet long & 8 inches square, top bevelled, sides trimmed. marked in deeply cut characters on north "W" on the south "O" on the east "46 L 1864" and on the West "22 M". Earth mound 8 feet square at base & 4 feet high, tapering to post. Earth well packed and sodded.

Dug deep quadrangular trench, also 4 pits at Cardinal points of mound.

This mound is nearly surrounded by small hills.

S 13-14

The boundary passes between slight depression of hills at 570 Chains on W. S. W. slope, near head of small ravine, intersected north and south line between sections 13-14 & T. 6. N. R. 34 E.

Bearings to lone tree in distant Mtⁿ. ridge S 32° 52' E, distance 12 miles, to rock at head of ravine S 27° 11' N.

1864

June 10

distance 6 miles to Yalama mountain peak N 76° 24' N. distance 50 miles

Erected post properly marked; built mound of earth, dug pits &c. as usual. Passing over gradually ascending country without any noticeable feature to east of 40 Chains.

Bearings: to mountain peak north clump of timber N 77° 04' E, distance 27 miles to S. W. Cottonwood tree on

38
Walla Walla River N 40° 09' W. distance
4 1/2 miles to trim trees on distant mountain
ridge S 31° 27' 30" E, distance 12 miles,
to rock abutting from
1/2 m side of mountain ridge S 51° 36' W
distant 6 miles.

Made excavation 2 1/2 feet deep. Planted
Alder post 6 feet long & 4 inches square,
marked on West side "1/2 M". Built
mound of earth, sodded, dug trench,
4 pits &c.

Proceeding on line east in 42 Chains
slight decline to gradually rolling prairie
with marked depression to S. W. 77 Chains
Cross road to old Hudson Bay Co's farm
80 Chain, the mile terminates in level
prairie.

Bearings to mountain peak with timber
on top N 77° 09' E, distance 35 miles to
trim trees on distant ridge S 29° 54' E
distance 11 3/4 m to center of small grove
of timber S 6° 10' W, distance 5 miles to
large Cottonwood trees on Walla Walla Riv^r
N 53° 07' W, distance 6 miles.

23 M Planted a Cottonwood post 9 feet long, & 8 inches
when sides were trimmed; top bevelled.
Made excavation 3 1/2 feet deep & deposited
Charred stakes. Post was marked in
deep cut letters on north face "W" on south
"O" on east "46 L 1864", and on West "23 M"

Built earth mound 8 feet square at base
& 4 feet high tapering to post, sodded
& earth packed. Dug trench & pits
150 links south of post a road bears N. E.
Thence up gentle swell of prairie 350 Chains
to intersection of north & south line between
Ranges 34 and 35 E, sections 13-18.

Bearings to Catholic Seminary N 59° 15' E
distance 8 1/2 miles. Center of far distant
Mtn peak N 62° 34' W, distance 46 miles
to center of rock on side of mountain S 20° 38' W, dist 5 M,
to lone pine on distant mtn side S 22° 19' E.

dist. 15 miles. Deposited bones, plants
post marked T. 6 N. R. 35. E. S 18. & T 6 N. R. 34 E. S 13
Dug mound, dug trench & pits. Thence
east, the line passes along north side
of gentle hollow, over small hill and
descending into shallow flat to the end of
40 Chains.

Bearings: to tree in mountain gap S. 68° 22' E.
distance 24 miles.

1864
June 11 Made Excavation: deposited bones: plants
an alder post 6 feet long & 5 inches
diameter, marked on west side "1/2 M"

1/2 M. Erected earth mound, dug trench & pits.
Passing over undulating prairie, descend
to gravelly flat seemingly the dry bed
of an old river. The 80 Chains terminates
on edge of small descent, Bearings. to
center of clump of pines on Blue
Mountains, N 83° 43' E. distance 20 miles
Chimney to house S 68° 24' E. distance
1 mile to mound covered with brush
on side of mtn. S 46° 29' N. distance
7 miles to Birch: tree on Mud Creek
distant 1 mile N 48° 48' W. Made
excavation 4 feet deep. Deposited
Charcoal & a large quantity of bones
Erected heavy alder post 8 feet long
& 8 inches square, sides trimmed, top
bevelled, and marked on north face "N"
on the south "O" on the east "46° E 1864"
and on the west "24 M".

24 M. Dug earth mound 8 feet square
at base & 4 feet high tapering to post
in center. Earth packed & sodded. Dug
deep quadrangular trench and 4 pits.
Section 18-17, T. 6 N. R. 35 E. Closely within
limits and no post was erected, which
is the case as far as the land surveys
extend east.

Proceeding east along flat at 38.50
Chains, Mud Creek, a small deep,
stream 12 links wide, course N, and

Department of the Interior.
General Land Office.
February 6th. 1866.

The foregoing field notes of the survey of the Oregon and Washington Boundary on the 46th Parallel of North Latitude from the Columbia to Inasw Crois, together with astronomical observations, reductions, & discussions of final results, executed by Daniel G. Major, Astronomer Surveyor under his Contract of April 25th 1863, having been examined they are hereby approved.

J. M. Edmunds
Commissioner

Department of the Interior.
General Land Office

Washington D C February 17, 1897

I hereby certify that the foregoing transcript of the field notes of the survey of the Oregon and Washington boundary line (omitting astronomical computations and deductions,) is a correct copy of the original field notes of said survey on file in this office.

S. M. Edmunds
Commissioner.