



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.

2 Cent
U.S.
Int. Revenue
Stamp

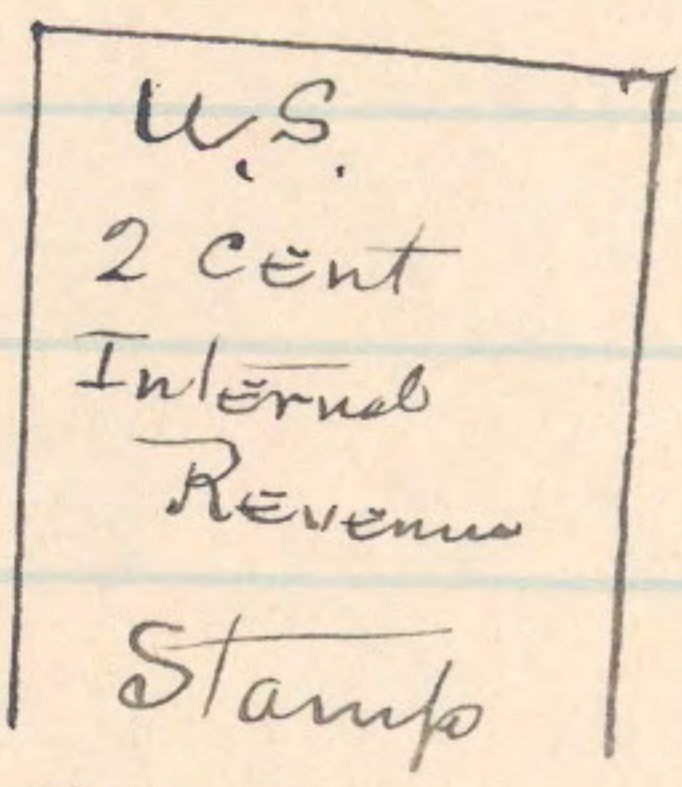
Geo. H. Fogg,
Justice of the Peace

I, John Major, do hereby certify that I have assisted D. G. Major astronomer & Surveyor, to determine & 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 through out

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.

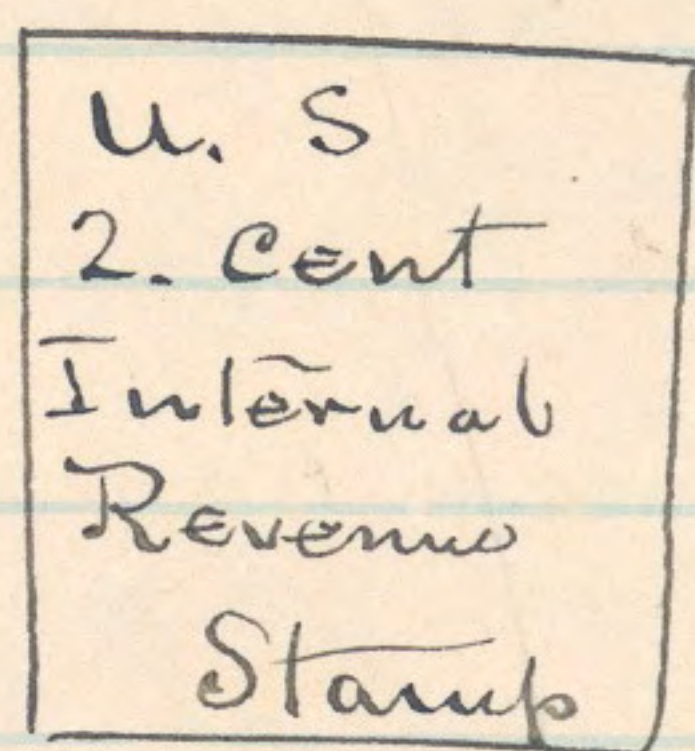
The monuments were all of larger
size than were required by the terms
of the Contract. After putting in monuments
to the 42nd mile, it was not possible to
continue accurate measurements with
the chain, nor to erect monuments at
the end of each mile; but they were
erected, as the field notes show, on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

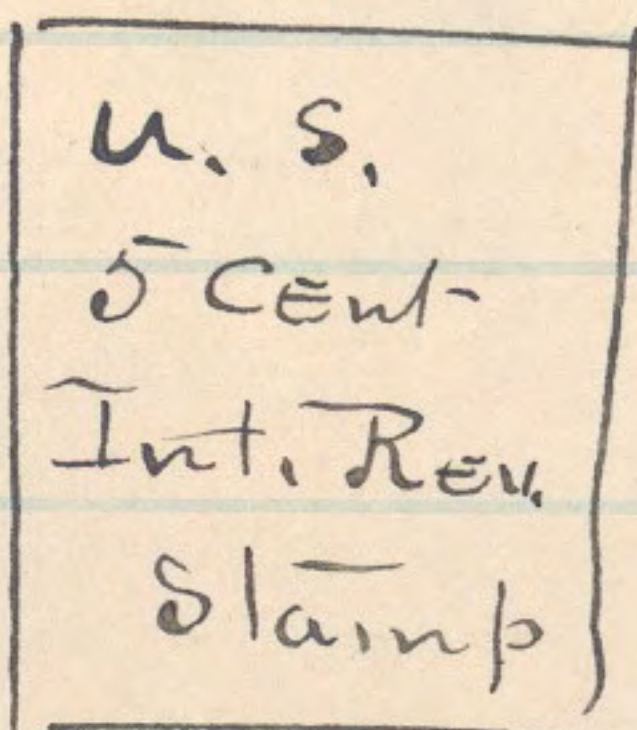
Geo. H. Perrin
Chairman.

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

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

general direction W. N. W. fringed with small brush & sides boggy. Land 1st & 2nd cuts, 40 Chains ends in angle of Mud Creek, 2 Chains north of it, Magnetic variation 21° E. Bearings: to rock in ravine S 33° 36' W. distance 7 miles, to gap in mountains S 66° 51' E. Distance 22 miles.

1/2 M

Made excavation 3 feet deep deposited a quantity of Charcoal. Planted a birch post 6 feet long and 6 inches square. Threw up an earth mound, dug trench with pits &c, East, across flat bottom 51 Chains, ascent steep bluff 50 feet high, Course N. W. a prominent land mark, 57 Chains, Cross wagon road Course S. W. thence over Lilly Country, 80 Chains ends on shallow flat, with decline to the east.

Bearings to timbered peak on Blue Mountains N 75° 46' E. distance 25 miles to middle tree of three pines, close together on mountain side, S 26° 54' E. distance 18 miles. No other objects.

1864 June 13

Made excavation, deposited Charcoal Erected Cottonwood post 8 feet long & 8 inches square: top bevelled, sides trimmed and marked, on north face "W" on the south "O" on the east "46 L. 1864". and on the west "25 M".

25 M

Erected mound of earth 8 feet square & 4 feet high tapering, dug quadrangular trench & 4 pits. Note, From the 22nd to 25th mile inclusive, the boundary was measured with a variation of 40 links in excess. The corresponding miles in the old section west of township 7, do not accord well. Running east, the Boundary line passes over sandy hills and alluvial flats to the end of 40 Chains Bearings: to flag staff, Fort Walla Walla, N. 48° 04' E. distance 5 1/4 miles. to Yakama Peak N. 77° 38' W. distance 50 miles to

Chimney on house S 78° 05' E, distance
144 Chains to bald spot on rock on Mountain
side S 51° 13' N, distance 8 miles.

1/2 M

Made excavation, deposited bones, Planted
post 5 1/2 feet long & 4 inches square marked on west
side "1/2 M". Built an earth mound well
packed & sodded, 5 feet at base and tapering
3 feet high to post in center.

Dug trench & 4 pits, 12 links east, a
way on road course N by W. 3 Chains
proceeding east edge of bluff & ditch
bearing N by W. Enter enclosed claim
of I. Beauchamp, descend 40 feet in 1/4
Chain. thence through rich bottom
46 Chains to tributary of Malla Malla River
30 links wide, running north, a clear
rapid stream of good water, depth
about 3 feet. Growth of brush and a
few trees on its banks. Soil 1st rate,
land, level bottom, under cultivation.

79 Chains, opposite I. Beauchamp's
house a few chains S. 79.54 Chains
a small tributary of last stream,
89 chains ends in cultivated field.

Bearings to Mt. pear, with clump of
timber on top N 75° 14' E, dist. 24 miles
to rock on mountain side S 47° 19' E.

distance 15 miles to a small cottonwood
tree blazed & marked "O" S 22° W, distance
2 Chains, Diameter of tree 6 inches

26 M

Made excavation 3 1/2 feet deep,
Deposited Charcoal and Cherry Stakes
Planted alder post 8 feet long & 8 in.
square, durably marked on north face
"W" on south "O" on the east "46 L 1864",
and on the west "26 M".

1864
June 13

Built mound of earth. Dug trench
and pits, all of usual size & location.
Thence east through cultivated field
24 Chains, Cross small stream bearing
north, thence through enclosed claim
of Mr Harrington, 40 Chains terminated

on small hill N & N. E. Bearings
to John Dannis' house S. 10° 27' E. distance
3/4 mile to Mr. Wm. Perricks house
S 3° 23' N. to birch tree distant 1/2
mile N 77° 02' W.

Made excavation 2 1/2 feet deep, deposited
bones. Built earthen mound 4 feet square
& 3 feet high.

1/2 M

Dug trench & 4 pits Post a birch 5 1/2 feet
long & 4 inches square. Mounds on west
face "1/2 M". Land moderately level, soil
2nd rate. East through Cultivated field,
Cross old wagon road, bearing N & S,
enter flat, stony worthless land, 79 Chains
Cross Wagon Road bearing S. W. 80 Chains
end on west edge of old wagon road,
Course N & S. Bearings to tree N 25° 50' E
distance 2/3 mile. Chimney of M. Chartres
house N 2° 56' E. distance 12 Chains,
Cottonwood tree, 12 inches diam, class
& marked "O" S 42. 37 E. distance 12 Chains,
Cottonwood tree 12 inches diameter, class
& marked "O" S 10° 00' 30" N.

Made excavation & deposited Charcoal,
Planted Cottonwood post 8 feet long
& 8 inches square.

27 M

Mounds as usual. The west side "27 M".
Built mound odder. Dug trench & pits
except on east side which was in the
road, deposited bones, Boundary passing
east in 4 Chains. Strikes middle branch
of Walla Walla River, 30 links wide, course
N by W, a large volume of good water.
Current rapid. Sparse growth of
Cottonwood & alder on either bank.

Thence through Cultivated fields 1st Class
land to 17 Chains, the east fork of Walla
Walla River, 25 links wide, rapid current,
good water & banks fringed with small
timber & brush. Course N. Thence
through fields Cultivated by Mr. Ingle,
Cross ditch and enter alkali flat to

end of 40 Chains. Bearings to highest water peak
no timber, N 79° 05' E. distance 20 miles Chumney to
1/2 M. house N. 23° 02' W. distance 3/4 mile.

Chumney S 22° 44' N. dist 18 Chains,
Mountain Gap, S 61° 50' E. distance 22 miles. Made excavation
deposited Corro lead & other bones also an Indian Stone
hammer 5 inches long & 2 1/2 wide.

1864 Planted a birch post 6 feet long & 4 inches
square, Marked on west side 1/2 M.

June 14 Threw up an earth mound well packed
& sodded, Dug trench & 4 pits.

Proceeding east over alkali flat, covered
with grass wood brush, cross a
narrow salt swamp meadow, bearing
N. N. W. then ascend small sandy hills
and cross divide between waters of
Kalla Kalla & Tomelou Creek. The mile
terminates on small sandy divide 2.35
Chains north of old wagon road, bearing
E. W.

Bearings: to ridge of Simons Mill
N 39° 38' E. distance 3 M. to small peak
on Columbia River N 82° 02' W. distance
24 miles to lone pine on mountain top S. 54° 21' E.
distance 10 miles to rocky place in ravine S 18° 19' 30" W.

28 M. dist. 10 miles. Made excavation 3 1/2 feet deep, deposited
bones. Erected cottonwood post 8 feet
long & 9 inches square trimmed &
top bevelled.

Marked on north side "W" on south "O"
on east "46° L. 1864" & on west "28 M"

Quiet mound of earth sodded, dug deep
quadrangular trench & pits, thence east
2.50 Chs. old wagon road course S. & N.
then descend gradual slope 18.50 Chs.
Cross military or old emigrant road
to the Dalles, course N. N. E & S. S. W.
25.50 Chs. top of bluff descend 30 feet to
Creek bottom, 35 Chs. to edge of brush
and swamp; thence through brush
38 Chains to the "Tomelou" a rapidly
flowing stream 40 lewis wide & with the

1/2 M.

a larger volume of water than either branches of the Walla Walla: along the banks are birch, Willow, alder & Cottonwood timber 40 Chains end in bottom among brush. Erected birch post 6 feet long &c, marked on west side 1/2 M. Threw up a small mound with trench & pits.

Thence through enclosed field 50 Chains to small Creek. Course N. W. 53 Chs. small Creek. Course N. W. 58.50 Chs. to wagon road Course S. S. W. 65 Chains top of bluff 25 feet high. Course S. S. E. thence to 80 Chains on high level land. Soil 2nd rate. Good grazing. Bearing to ridge of Catholic Seminary N 15° 24' E. distance 4 1/2 miles to house on Duch Creek. S 70° 11' E.

29 M.

Distance 4 miles to flag staff at Ft. Walla Walla N 6° 39' W. distance 3 4/5 miles to house on Tomlin Creek S 38° 10' W. distance 3/4 mile.

1864
June 14

Made excavation 4 feet deep, deposited Charcoal. Planted Cottonwood post 9 feet long & 6 inches square, when trimmed, top beveled. Marked on north face "W", on south "O", on the east "46 L. 1864", and on the west "29 M".

Built mound 8 feet square at base and 4 feet high tapering to post in center. S added. Dug deep quadrangular trench 18 inches wide & deep, also dug as usual 4 pits at Cardinal points of mound. This monument is east of north & south section line 13-18 and range line 35-36 E. one chain & fifty links A road north & south passes near post, thence east over undulating prairie, poor land & grass. 1/2 mile, falls in shallow decline, bearing N. N. W.

Bearings: to S. E. point of timber

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 Snaw Croix, 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.