

Presidential Surveyors:
*The Surveying Work
of George Washington,
Thomas Jefferson, and
Abraham Lincoln*

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George Washington

Colonial Surveyor



**George Washington
surveying on Lord
Fairfax's lands; From Old
Times in the Colonies,
Charles Carleton
Coffin(New York, Harper
& Brothers, 1880)**



**Statue of George
Washington the surveyor,
Winchester, Virginia**



Washington's Surveying education

At age 13, made notes on mathematics and surveying theory in his schoolbooks, summer of 1747 (age 15) began to seriously prepare to be a professional surveyor under the tutelage of an experienced surveyor.

Around his home at Ferry Farm, near Fredericksburg, he received theoretical and field instruction.

Lessons based at least in part on John Love's *Geodaesia*; and "to teach surveying as it was practiced in mid-eighteenth-century Virginia, the instructor variously selected, abstracted, altered, and supplemented the lessons in *Geodaesia*."

Included in the estate of his father Augustine, (died in 1743) were a circumferentor (plain surveying compass) and a surveyor's chain, and these may have been the instruments George learned with.

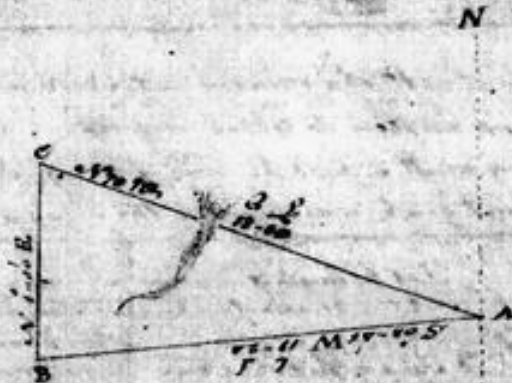
He “soon became adept in the art of traverse surveying”, and the lessons in his surviving school notebooks include problems “determining the length of a line across an inaccessible area such as a creek or marsh, plotting an entire field from one or two stations, locating a place on a map by triangulation, surveying an irregular shoreline with a series of offsets, and dividing tracts in various complex ways.”

Surveying of Land

How to take an Inaccessibile distance bet two Stations
It is required to find the Distance from A to C there
being a Creek or other Impediment between

Admit it to be the side of a field which cannot be mea-
sured by the Chained there being some land around it & no Marker
except Creek yet.

To find the Distance Above the following Rule, place of
Instrument at A direct your sight to the Stake cutting
on it W distance of 60 then remove your Instrument to
B direct y^r sight to C y^r Stake cutting N 1 - 00 E where this
Course intersects the view of the field, in the true distance from
A to C on the Example

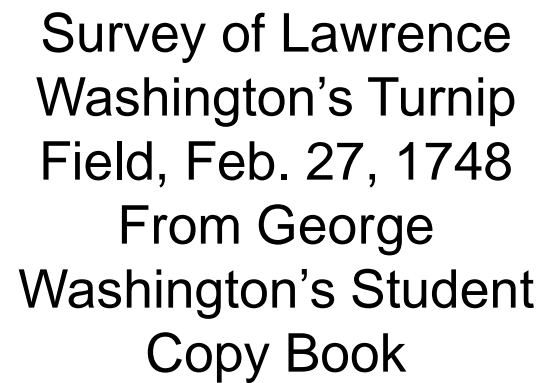


Conf. of Bureau of AC in N York W. C. 50

Surveying Lessons,
“How to take an
Inaccessible distance
at two Stations ...”
From George
Washington’s
Student Copy Book
(Library of Congress)



George
 Washington's first
 survey, October
 1, 1747; 22
 acres, 3 roods, 19
 perches
 From George
 Washington's
 Student Copy
 Book



Surveying Apprenticeship

Training completed spring 1748, apprenticeship under James Genn, Prince William County Surveyor, laying off large tracts along the South Branch of the Potomac.

In March, George and 24 year old George William Fairfax, son of William Fairfax, set out for the Virginia backcountry. Met Genn at George Neville's ordinary, and crossed the Blue Ridge to the Shenandoah Valley.

Surveys drawn up and submitted to proprietor's office by Genn. Washington kept small notebook, unofficial record of the bearings and distances. He was learning to draw up and submit surveys to the proprietor, anticipating future work for Fairfax. In late March, began eight days along the South Branch, surveying twenty lots from 238 to 680 acres.

On the fourth one George noted "This Lot Survey'd myself."

Professional Surveying Career

Novices usually started as assistant county surveyor.

Undoubtedly aided by Fairfax influence,
17 year old George presented a commission appointing
him County Surveyor of newly formed Culpeper County
in 1749.

Commissions issued by the College of William and Mary.

Surveyors did not enroll or stand an examination.

1693 charter empowered the College to appoint county
surveyors to provide a source of revenue.

Authorized to collect one-sixth of surveyor's fees.

Very hard to collect, and in appointments the school
regularly deferred to the wishes of powerful men.

Professional Surveying Career

On July 22, 1749, Washington's first professional survey was 400 acres on Flat Run near today's Brandy Station in Culpeper County.

No other surveys known in Culpeper County.

During the next 3 ¼ years mostly worked in Frederick County, which included all of the Northern Neck west of the Blue Ridge.

Culpeper formed from existing Orange County, mostly settled and granted. Easier to make money in ungranted lands on Shenandoah and Cacapon rivers.

Until August, 1750, his surveys in Frederick County had the initials S.C.C. (Surveyor of Culpeper County) after his signature. Only those with commissions could legally make public surveys.

In 1750, Henry Lee replaced Washington as Culpeper Co. surveyor.

George's later work was as asst. to Frederick County Surveyor James Wood, or special private surveyor to Lord Fairfax.

Continued to survey on the frontier until fall of 1753 for grants in Lord Fairfax's proprietary.

Professional Surveying Career

In November 1749, Washington's first warrants sent him to Lost River on the upper part of Cacapon.

Ran 15 surveys in 11 days, 330 to 400 acres.

Many joined; one line useful for two surveys.

Surveyors often used locals as chainmen, but John Lonem worked as head chainman on about half of George's jobs, since Lonem's "accuracy and speed with a chain apparently justified taking him frequently from survey to survey."

Closing lines apparently calculated rather than run.

Professional Surveying Career

In a little over four weeks in 1750, George made 49 surveys mostly on the Cacapon and its tributaries: Seven times he made three surveys in a day, and on one day he did four.

During the last half of August, 1750, he ran 12 surveys near what is now Charles Town, West Virginia. Seven were for his half brother Lawrence and one was for his half-brother Augustine. George's youngest brother Charles later inherited some of the land, including the site of Charles Town, from Lawrence, and Charles settled there.

In the fall of 1750, George surveyed for almost seven weeks in the Shenandoah Valley, making 30 surveys.

Two of those surveys, of 453 acres and 456 acres, he made for himself, along with about 93 acres of unclaimed land. At age 18, George owned 1,003 acres in the Shenandoah Valley.

He surveyed another 760 acres of unclaimed land for himself in 1751.

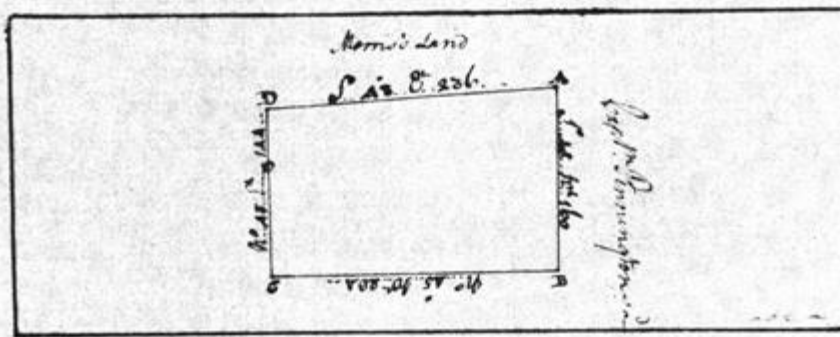
Professional Surveying Career

At the age of twenty George owned 1,862 contiguous acres on the South Fork of Bullskin Creek, with his total holdings in the lower Shenandoah Valley being 2,315 acres. In comparison, his brother Lawrence's Mount Vernon estate contained 2,298 acres in 1752.

The money for the land came from his surveying fees. He made about 400 pounds during his surveying career of a little over three years. Very few men in the colonies made more than 100 pounds a year.

In the fall of 1752, he stopped surveying for profit, and on November 6 began the first stint of his varied military career, eleven days after his last professional survey.

George Washington made 199 surveys during his professional career.



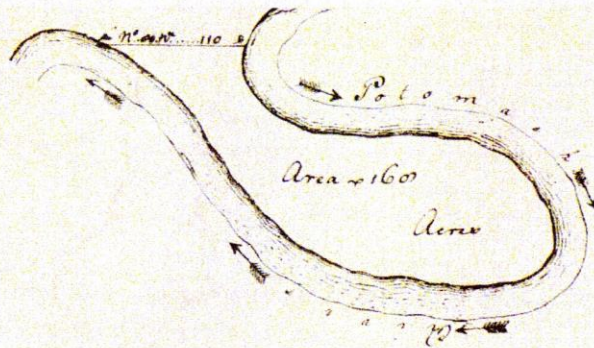
Pursuant to a warrant from the Proprietors Office to the directed I have Surveyed for Mr. John Lindsey a certain tract of waste and ungranted Land in Frederick County bounded as follows to wit.

Beginning at a Walnut and Red Oak Morris's Patent Corner and in the line of a late Survey made for Isaac Pennington and extended along the said Pennington's line N. 45° W. 100 paces to a white Oak and double white hick near a limestone Rock thence N. 45° W. 226 paces to a Red Oak and locust sapling in the Morris's thence N. 45° E. 100 paces to Capt. M. Pennington's Corner 100 paces to a Red Oak Morris's C. thence with his line S. 45° E. 226 paces to the Prop. Corp. Two hundred and Twenty Six Acres Nov. 17th 1750

Henry Hendrick }
Stephen Sebastian } 66
John Lindsey - Master

by M. Washington

Survey of 225 acres
for John Lindsey,
Nov. 17, 1750, near
Berryville, Virginia



Pursuant to a Warrant from the Proprietary Office so directed
I have surveyed for Enoch Enoch a certain tract of Land on the
River bounded as followeth (Viz) — Beginning at broadside
in the river and then on the River Bank and extended N. 88 W. one hundred
and ten paces to two pines on the river thence across the several
meadows thence of N. 9. 50 E. twenty two paces N. 10 W. thirty four
paces N. 20 W. twenty two paces N. 27 W. thirty paces N. 70. 50 W.
twenty four paces N. 01. 10 W. forty six paces N. 70. 50 W. eighteen
paces N. 70 W. thirty eight paces N. 60 W. thirty two paces N. 50 W.
thirty two paces N. 20 W. eighteen paces N. 40 W. eighteen paces
N. 20 W. twenty two paces N. 20 W. twenty two paces N. 76 E.
twenty four paces N. 06 E. twenty paces S. 03 E. twenty paces
to the Mouth of a gulch that contains a pond S. 72. 50 E. thirty paces
S. 72 E. twenty two paces S. 55 E. forty four paces S. 59 E. forty
paces S. 20 W. 50 E. eighty paces S. 24 E. thirty paces S. 22 E.
eighteen paces S. 05 E. twenty six paces S. 00 E. fifty paces to the
Beginning containing One hundred and thirty eight Acres
this 24th of Apr. 1751

Witness my hand
at Annapolis
Samuel Pumb

by

Washington

**Survey of 168 acres for
Enoch Enoch, Apr. 24,
1751, near Paw Paw,
(West) Virginia**

At Isaac Pennington's

Beginning at a Walnut and Red Oak Morris's Patent
corner and in the line of a late Survey made for Isaac
Pennington and extended along the said Pennington's
line 1st 45th Wth 560 poles to a white Oak and double

Later Surveying Activities

Never gave up surveying.

Lamented the loss in 1754 at Fort Necessity of
“a very valuable, and uncommon Circumferentor calculated not only
for Superficial Measure, but for taking of Altitudes ...”

According to Philander D. Chase: “...his abilities in the
military use of surveying instruments was inferior to his civilian
employment of them, not a surprising conclusion since **military
engineering was a more exact science than frontier surveying**
... familiarity with surveying, ... gave him an advantage ...in planning
fortifications and consulting with engineers.”

**Repeatedly surveyed Mount Vernon boundaries
in attempts to settle disputes,**

Laid off fields and tenements, surveyed new purchases.
Last surveying In November 1799, five weeks before his death.

At age 58 he owned 52,000 acres.

Rented out Shenandoah Valley lands, made little on holdings further west.

Wrote in 1794 “that landed property at a distance from the Proprietor, is attended with more plague than profit.”

“If he was often discomfited by defects in his formal education, Washington took pride in his ability to read a tract of land with his practiced surveyor’s eye as expertly as a Latin scholar perusing a page of Cicero or Tacitus.”

Another Viewpoint

Excerpted from Guest Editorial: A George Washington
Survey

John L. Failla, PLS, Professional Surveyor Magazine, May
2007

I find no tragedy or flaws of character in
Washington's life, unless you consider his desire
for social standing, marriage without issue, lust
for money and land, exaggerations, and basic
human greed.

“Washington's method for computing acreage was by breaking down his field survey into triangles. This method is the most elementary and simplest course to find acreage by computing the area of each triangle. If the triangle wasn't a right triangle, Washington seems to struggle with results, suggesting a basic deficiency in his ability to accurately compute for closure and area.”

“Most surveyors at that time were employing the DMD method.”

I haven't seen evidence of the use of DMD's in frontier surveying work.

“Computing surveyed boundaries for accuracy, closure, and acreage today should have been no different than in Washington's time of employment. Math hasn't changed; the only change is the equipment in gathering and processing that same information.”

**Math hasn't changed, but the ease of using it has.
What about Monroe calculators, electronic calculators,
and computers?**

Like all Virginia surveyors, G.W. was commissioned by William & Mary College, and

“Any evidence that George Washington stepped foot in the halls of William and Mary is nonexistent. Where Washington ever tested for the Crown Surveyorship of Culpeper County is nonexistent.

Where Washington ever posted a bond or compensated The College of William and Mary the one-sixth stipend, which was required and stipulated before the appointment, cannot be found.”

Thomas Jefferson

Renaissance Man

Peter Jefferson, Surveyor, Thomas Jefferson's Father

William Mayo (1684-1744)
was Goochland County Surveyor from 1728-1744.

Peter Jefferson, a young back country speculator and land developer, moved to Goochland County and became one of Mayo's new neighbors.

Mayo and Jefferson soon became acquainted, a friendship developed, and Mayo invited Jefferson to accompany him on some of his later field trips. It is believed that Peter Jefferson learned the rudiments of surveying from Mayo.

In 1746-47, Albemarle County Surveyor Joshua Fry and Peter Jefferson worked on the Fairfax Line survey, and in the fall of 1747 they worked together on competing the Virginia-North Carolina boundary. In 1755, they collaborated on the Fry-Jefferson map of Virginia.



Title block and the mouth of Chesapeake Bay,
French edition of the 1755 Fry-Jefferson Map of Virginia.

Thomas Jefferson's Surveying Education and Career

Jefferson learned some surveying from his father, and had a lifelong interest in the profession and in quality surveying instruments.

He was appointed Albemarle County Surveyor in 1773, but the county was mostly settled up, then he got married and needed to make more money.

In 1777, he surveyed the entire Albemarle County boundary, and cut out newly formed Fluvanna County.

**Like many who surveyed in their youth,
He could never entirely give it up.**

Other Surveying Activities and His Influence on the Profession

In 1803, convinced Congress to fund the Lewis and Clark Expedition.

In 1804 was instrumental in establishing American prime meridian in Washington, D.C., with “Jefferson Stone”

In 1807, got Congress to establish the Survey of the Coast, precursor to National Geodetic Survey



SOUTH PEAK OF OTTER, FROM THE HOTEL.

In the 1850's,
a stone from the Peaks of Otter was installed on the
Washington Monument's 12th stair landing,
engraved as follows:

From the summit of Otter,
Virginia's loftiest peak,
To crown the monument
To Virginia's noble son.

What about Spruce Knob
And Mount Rogers?

Thomas Jefferson wrote about the Peaks of Otter in his Notes on the State of Virginia, written in 1781-82, and published in 1787:

“The mountains of the Blue ridge, and of these the Peaks of Otter, are thought to be of a greater height, measured from their base, than any others in our country, and perhaps in North America. From data, which may found a tolerable conjecture, we suppose the highest peak to be about 4000 feet perpendicular”

In 1816, Jefferson set up a base line in a nearby valley and used triangulation and vertical angles observed from each end of the base to calculate the heights of Sharp Top and Round Top, relative to the valley and to each other.

Thomas Jefferson reported the difference in elevation between Sharp Top and Flat Top of the Peaks of Otter as being 157 feet, while more modern information indicates a difference of 126 feet or 129 feet. The USGS topo maps indicate Sharp Top is at 3862 feet, and Flat Top is at 3994 feet, for a difference of 132 feet.



Jesse Ramsden Theodolite,
purchased by Thomas
Jefferson c. 1778;
this is apparently the
instrument Jefferson used
in his 1815 observations at
the Peaks of Otter;
Photo courtesy of
Thomas Jefferson
Foundation/Monticello

***Spearheaded Establishment of the
University of Virginia***

**Designed the campus,
and began surveying the layout in 1817.**

Became Rector of the University.

Statue dedicated in 2007



Statue of Thomas Jefferson surveying the University of Virginia,
Darden School of Business, UVA, Charlottesville, Virginia



**Jesse Ramsden
Theodolite,
purchased by
Thomas Jefferson
c. 1778**



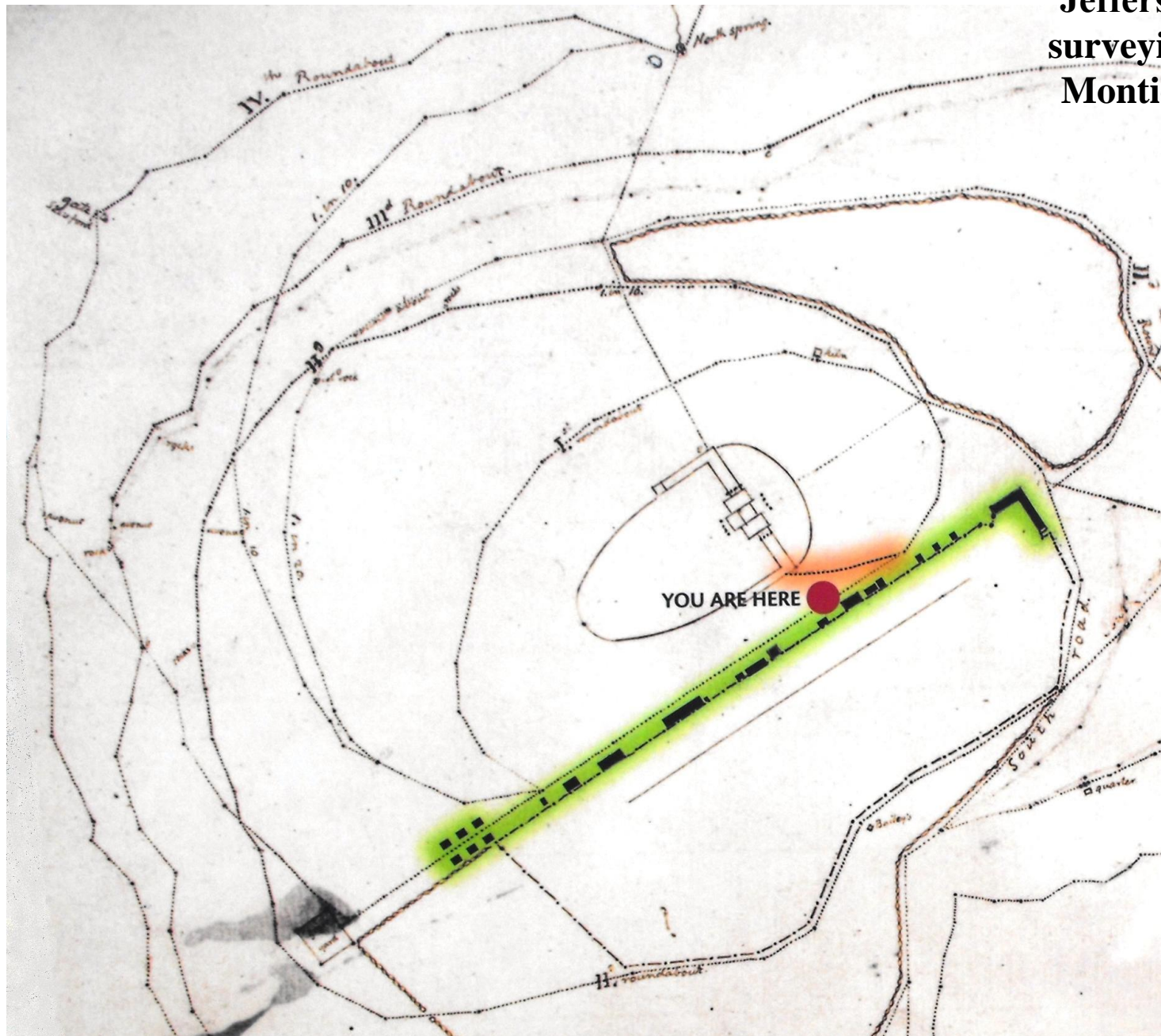




**Thomas Jefferson's compass, courtesy of
Thomas Jefferson Foundation/Monticello**



Jefferson's surveying at Monticello



Other Surveying Activities and His Influence on the Profession

Like many who have dabbled in it during their early years, Thomas Jefferson could never really give up surveying. He made surveys of his own lands at Monticello and Poplar Forest, and did some surveying for his neighbors.

Washington on Jefferson

Washington “had great confidence” in Jefferson

Jefferson on Washington

His mind was great and powerful,
without being of the very first order;
...; and as far as he saw, no judgment was ever
sounder.

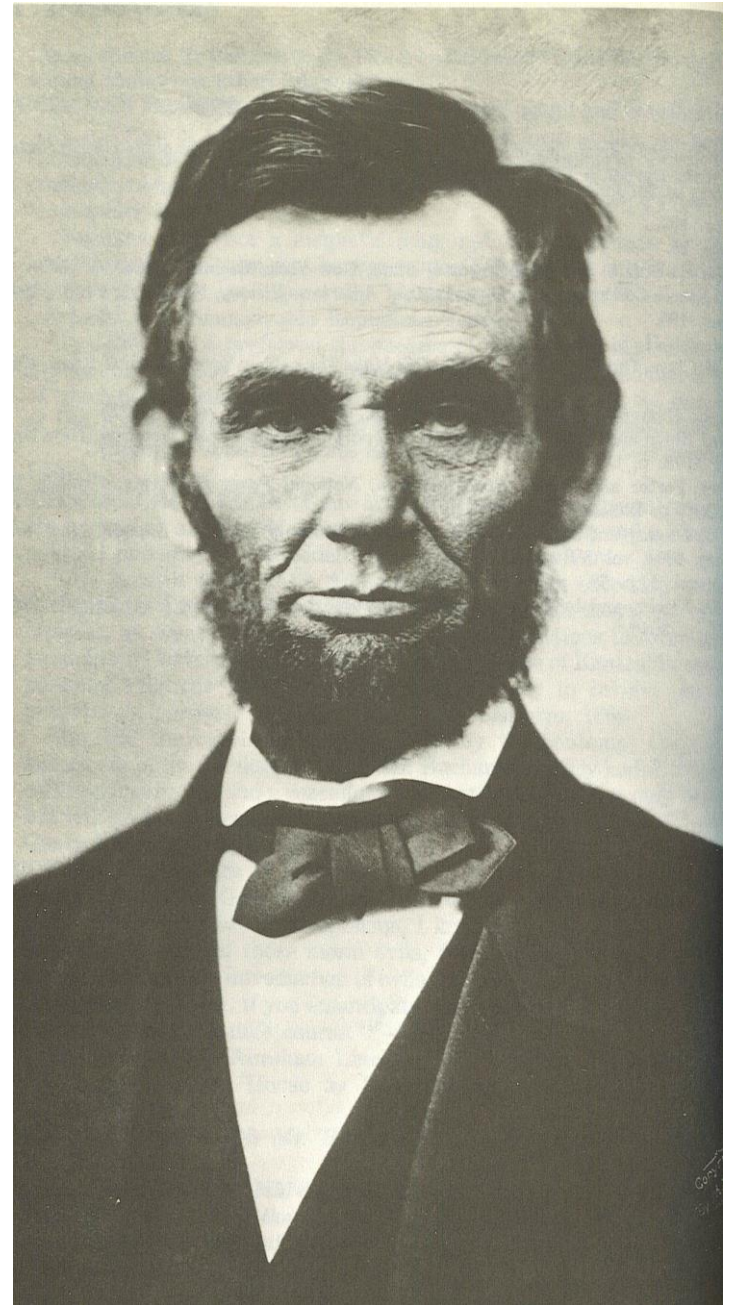
It was slow in operation, ... but sure in conclusion. ...

He was incapable of fear, meeting personal dangers
with the calmest unconcern.

Perhaps the strongest feature in his character
was prudence.

Abe Lincoln

Chasing Success



Lincoln Boyhood National Memorial, Indiana

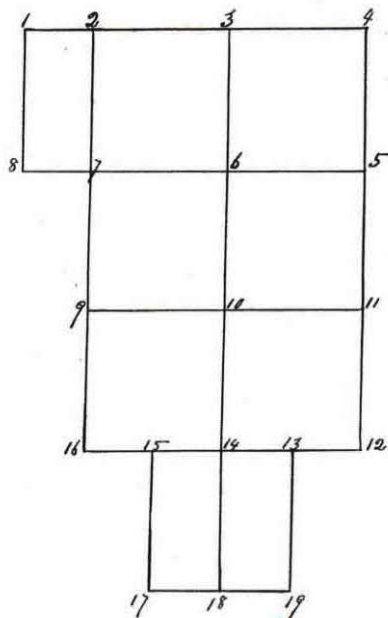


A bronze casting of sill logs and fireplace hearthstones symbolizes a cabin that the Lincolns began building in 1829.



Statue of Abraham Lincoln Surveying, New Salem, Illinois

No	Range	Section	Cont.	Acres
1	Rock	in	Mouquet	
2	Do	Do		
3	"	"		
4	"	"		
5	"	"		
6	"	"		
7	M. Oak	45	17 8	31
8	B. Oak	14	61 36	83
9	M. Oak	13	132 11	33
10	Rock	9	64 51	36
11	Elm	18	118 6	566
12	B. Oak	7	186 11	199
13	Oak	14	652 11	25
14	M. Oak	18	66 36	41
15	M. Oak	16	632 11	56
16	M. Oak	20	619 6	40
17	Rock	319	15 11	28
18	Rock	19	64 11	25
19	Rock	15	186 11	16
20	Rock	16	137 6	37

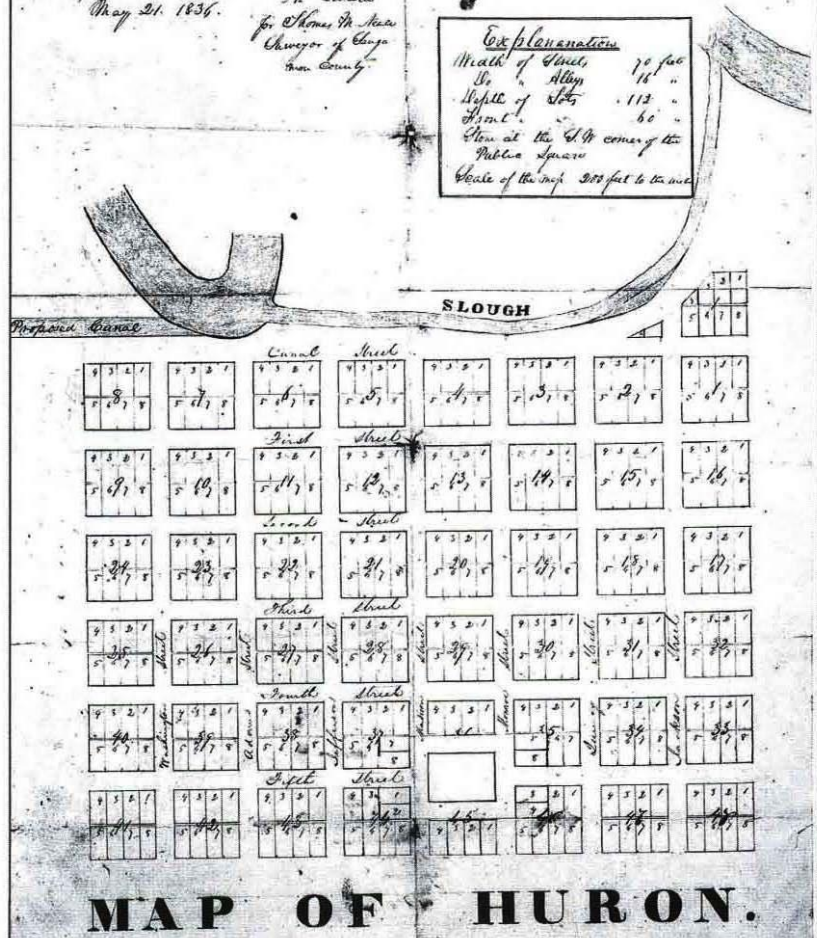


The above tract of land was surveyed for Pearson Shipley, being composed of the North half the West half of the South East quarter & the East half of the South West quarter of Section 23 the entire Section 23 and the East half of the North East quarter of Section 22 all of Township 19 North of Range 7 West

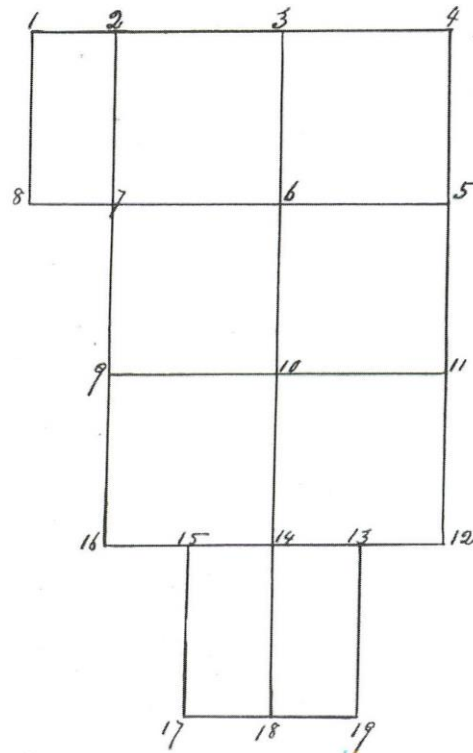
January 6-1834 J. Gallum S.P.
Chairman By A. Lincoln
Richard Howard
Abel Latimer

I hereby certify that the annexed is a correct map of the town of Huron as that the requests of the Statute in said cases made and are provided have been complied with.
May 21. 1836.
A. Lincoln
Surveyor of Huron County

Explanation
Width of Street 70 feet
Do " Alley 16 "
Depth of lots 113 "
Front 60 "
Point at the S.W. corner of the Public square
Scale of the map 300 feet to the inch



No	Range	Line	Course	Dist
1	Rock	in	Mound	
2	Do		Do	
3	"		"	
4	"		"	
5	"		"	
6	"		"	
7	M. Oak	45	N 7 E	31
8	B. Oak	14	S 13 E	83
9	M. Oak	13	N 32 W	33
10	Hick	9	S 45 W	36
11	Elm	18	N 19 E	566
12	B. Oak	7	N 88 W	149
13	Oak	14	S 52 W	25
14	M. Oak	18	S 83 E	41
15	D. Oak	16	S 32 W	56
16	M. Oak	20	S 19 E	40
16	M. Oak	9	S 15 E	31
17	Do	29	N 5 W	28
17	Rock	in	Mound	
18	Hick	14	S 67 W	25
19	B. Oak	15	N 18 W	16
19	Rock	16	N 7 E	37



Lincoln's survey for
Reason Shipley,
January 1834

The above tract of land was surveyed
for Reason Shipley, being composed of
the North half the West half of the
South East quarter & the East half of
the South West quarter of Section 23
the entire Section 23 and the East
half of the North East quarter of Section
22 all of Township 19 North of Range
7 West

January 6- 1834 J. Calloun SR
By A. Lincoln
Chairman
Richard Toward }
Alex^r Latimer }

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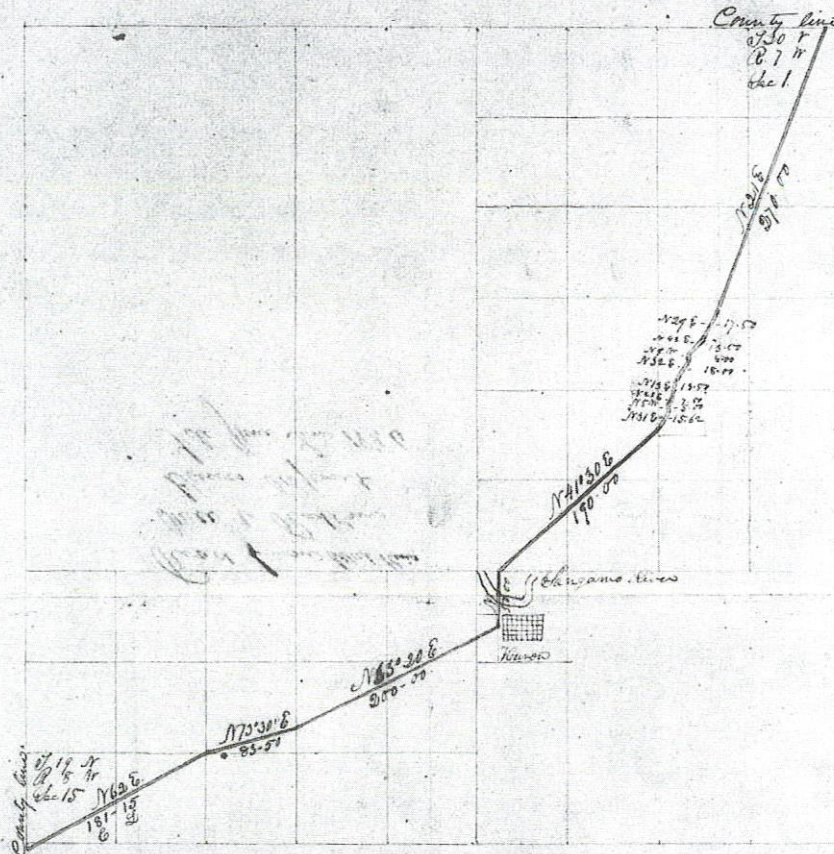
January 6- 1834

Chairmen
Richard Howard }
Alex^r Latimer }

J. Calhoun Sth.
By A. Lincoln

Title block of
Lincoln's survey
for Reason
Shipley

Watkins Mill Road Survey, 1836



To the Honourable County Commissioners Court for the county of Sangamon

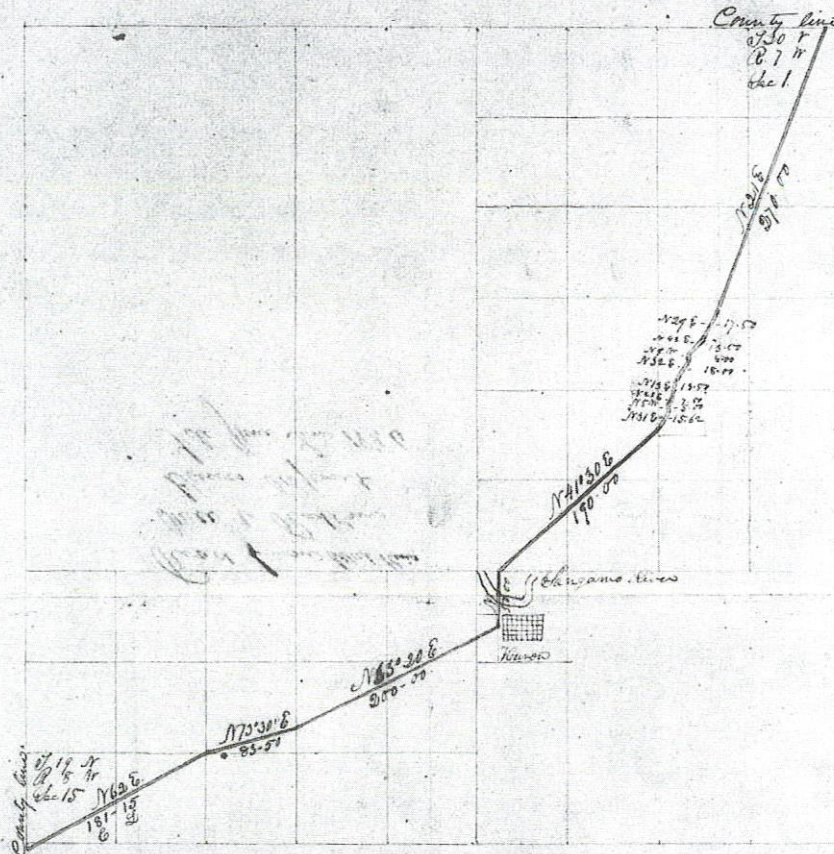
The undersigned, having been appointed to view and locate a road from the county line near Watkins Mills via Millers ferry to the county line in the direction of Pekin, report that they have made the location and recommend the opening of said road. The above is a plat of said road.

June 2nd 1836

Robert Cowman
M^{rs} G. Jeter
A. Lincoln

Make an allowance for one day and a half each.

Watkins Mill Road Survey, 1836



To the Honourable County Commissioners Court for the county of Sangamon

The undersigned, having been appointed to view and locate a road from the county line near Watkins Mills via Millers ferry to the county line in the direction of Pekin, report that they have made the location and recommend the opening of said road. The above is a plat of said road.

June 2nd 1836

Robert Cowman
M^{rs} G. Jeter
A. Lincoln

Make an allowance for one day and a half each.

Watkins Mill Road
Survey, 1836

To the Honourable County Commissioners Court for the county of Sangamon

The undersigned, having been appointed to view and locate a road from the county line near Watkins Mill via Miller's ferry to the county line in the direction of Tipton, report that they have made the location and recommend the opening of said road. The above is a Map of said road.

June 2nd 1836

Robert Cowman
Mrs G. Jeter
A. Lincoln

936/ Make us an allowance for one day and a half each.

Their Opinions About Each Other

Jefferson on Washington

***“[The President] errs as
other men do, but errs
with integrity”***

Jefferson to William Branch Giles,
December 31, 1795:

Washington's thoughts about Thomas Jefferson

Memorandum by William Plumer on March 16, 1806. Plumer expressed respect for Jefferson, and had reservations about his faults, but added:

“...no one circumstance tended so much to his elevation as the great confidence General Washington reposed in him. ...with a full & perfect knowledge of him. ... His conduct during & after the Revolution was known to Washington. And although Jefferson was publicly opposed to the adoption of the Constitution of the United States yet Genl. Washington when called to administer the government gave to Mr. Jefferson the most important confidential office under him, that of Secretary of State. ...The approbation of Washington, under these circumstances, is honorable.

I do not myself so implicitly yield to the opinion of Mr. Washington as some men do. Still I think his approbation is worthy of great notice. It renders popular, the man on whom it has been conferred, to a certain extent ... “

Lincoln on Washington

“ ... Washington is the mightiest name of earth – long since mightiest in the cause of civil liberty, still mightiest in moral reformation. On that name no eulogy is expected. It cannot be. To add brightness to the sun or glory to the name of Washington is alike impossible. Let none attempt it. In solemn awe pronounce the name, and in its naked, deathless splendor leave it shining on.

The Wit and Wisdom of Abraham Lincoln, Edited by Alex Ayres
New York, Meridian Books, 1992
p. 191, from an address in Springfield, Illinois, February 22, 1842.

Lincoln on Jefferson

“All honor to Jefferson – to the man who, in the concrete pressure of a struggle for national independence by a single people, had the coolness, forecast and sagacity to introduce into a merely revolutionary document an abstract truth, applicable to all men and all times, and so to embalm it there, that today, and in all coming days, it shall be a rebuke and a stumbling block to the very harbingers of reappearing tyranny and oppression.

Letter to Henry Pierce and others, April 6, 1859

The Wit and Wisdom of Abraham Lincoln, Edited by Alex Ayres
New York, Meridian Books, 1992
pp. 106-107