Keokuk Sept 30th 1850

Messrs Hendershott & Minor,
Commissioners of the Boundary Survey.
Gentlemen,

Having been appointed by you, on the part of the States of Iowa & Missouri severally, to locate & survey the Boundary between those States, under the decree of the Supreme Court of the U.S. we met, according to your appointment, on the 28th of April last, near the supposed site of the old N.W. Corner, for the purpose of commencing operations in the field -

We proceeded to search for the old Corner, which was to be the basis of our future operations. Having a certified Copy of Sullivan's field notes, from the Surveyor Genl's Office at St Louis, we knew that the Corner had been originally located in timber, and designated by two witness trees. Aided by a view of the topography of the locality, as indicated in the notes, and especially by the manner in which Sullivan's north line crossed the Platte river, near its termini, we were able to determine the locality of the Corner approximately; and on inspection of the ground satisfied us that every evidence of it exact position had long since disappeared - Time & the fires that annually spread over the prairies had destroyed the witness trees & every trace of both lines near the Corner -

This point, known familiarly as the "old N.W. Corner", was the termination of the line surveyed by Sullivan in 1816 from the mouth of the Kansas river north one hundred miles, & was the point at which he turned east in running to the Desmoines river; his miles being numbered north from the Kansas, & east commencing again at the Corner -

Having no direct evidence of the exact site of the required point, it became necessary to find determinate points in the two lines, as near the Corner as possible - Prolonging the lines severally from such points, their intersection would be the point to be assumed

the corner, & if Sullivan's measurement was correct, would be the precise spot
when he established it —

Near the supposed locality of the 99th mile corner on the north line we found
a decayed tree & stump, which corresponded in course, distance, & description
with the witness trees to that corner; & cutting into the tree, we found what we
supposed to be the remains of an old blaze upon which was pressed a post,
apparently, of the letter M. This supposition was verified by measuring south
two miles to a point which we found to be Sullivan's 97th mile corner, from the
witness tree which was plainly scribed. The marks upon it, two or three inches
beneath the bark, were plain & legible —

On the east line we found the witness tree to the 3d mile corner. The wood upon
which the marks had been inscribed was decayed, but three scribed impressions appeared
upon the new growth which covered the old blaze, & which was cut out in a
solid block —

Prolonging the lines 3 miles each from the point thus determined, this intersection
was assumed as the required Corner. At that point was planted the Monument specified
in the Decree. By measurements made from the surveyed lines, we found the corner
to be in the N. E. quarter of Section 35. South of the 6th North, Range 33 West. Its exact position
in reference to these lines can be seen in the diagram pinned to the field notes —

The latitude of the Corner, determined by a series of observations taken on the
ground, we found to be 40°. 34'. 40" north. While employed upon these observations,
we were delayed by unfavorable weather, & it was not till the 24th of May that we
were in readiness to commence the survey of the west line from the corner to the 11th

This portion of the Boundary being required to be a parallel of latitude, was
Burt's Solar Compass, the use of which requires the longitude of the place
observation to be at least approximately known. Not having the requ
means of ascertaining the longitude of the Corner, we calculated it fr
to be about 94°. 30' west from Greenwich, which was sufficiently accu
purpose. The instrument used being an untried one, some delay
in its adjustment. To ensure accuracy in the work a telescope was alt

The principles upon which this line was run involve a mathematical
were made. A accompanies

prolonged in the plane of the prime vertical passing through its beginning.
The direction indicated by the instrument stationed at the beginning of a mile
is in the plane of the prime vertical passing through that point, & that direction
was continued through the mile by means of fore & back sights. At the
end of the mile an offset north was made to compensate for the sphericity
of the earth. This offset, it will be seen by the note, is 6.853 inches for
one mile. The instrument being moved to the end of each mile the
proper distance north, & a new direction given & continued as before. the
parallel passing through the initial point was continued throughout the
line. In some instances however it became convenient, whenever the nature
of the ground admitted of it, to continue the same direction through several
miles, instead of offsetting at the end of each. It will be seen by the
note that the offsets increase as the squares of the distance, being for
one mile, 6.85+ inches - for two miles, four times that distance &c. Thus it
appears that the offsets rapidly increase with the distance run, & that
by continuing the direction of the prime Vertical from the corner & the terminus
on the Missouri river, the southing would have been over 2000 feet.

At the western terminus of the line the observations for latitude were repeated. Having established that point, we returned to the N.W. Corner, & commenced retracing Sullivan's East line on the 13th of August.

It is thirty four years since this line was run, & every vestige of the mounds & pits established in the prairies has disappeared. Much of the Country through which it passes, consists of bushy barrens, or high rolling prairies, dotted with detached groves, or covered with a thin growth of dwarf timber. Much of this description of timber has been destroyed by fire, forming in some instances prairie, & in others bushy barrens destitute of trees; while in some places an entirely new growth of young timber, principally hickory, has sprung up. In all such cases the witness trees & other marks mentioned in Sullivan's field notes, were gone, & thus it occurred that we frequently ran several miles without finding any trace of the line.

But in heavy bodies of timber no difficulty was experienced in discovering evidences of the precise location of the line, not only by blazes, but by the witness trees, many of which are found & the marks in good preservation.

The general topography of the Country, & especially the crossings of the streams, greatly facilitated us in following the line, & in some instances when confirmed by the old blazes, enabled us to establish it with sufficient certainty. In the absence of any traces of the line between two known points, distant from each other more than one mile, we assumed the line to be straight between such points & established our posts accordingly. This was done by running a random line from the last found Corner, in a course as near that pointed by Sullivan as we could determine, until another point was found & then Correcting back. No notice however is taken of these random lines in the field notes, which relate to the true line only.

We soon satisfied ourselves that the line run by Sullivan was not only not due east, but that it was not straight. That error or by whatever should have been made in the old line, was to have been expected from the fact that Sullivan ran the whole line with one variation of the needle, & that variation too great. This would account for the fact that the northing increases as he progresses east. But there are great irregularities in the line, for which it is difficult to find a cause. Sudden variations, amounting to from one to three degrees, frequently occur, & it rarely happens that any two consecutive miles pursue the same direction.

A resurvey of the line between the 9th & 134th miles was made in the year 1845, & we found the writings true on that part of the line adopted & thus substituted. We succeeded however in identifying Sullivan's trees, & we distinguish the marks of that survey as far as they relate to the old line in all instances when a corner on Sullivan's line is mentioned in our field notes, one or both witness trees were found, & we did not always think it necessary to repeat the fact in the notes.

Accompanying this report are the field notes & work of the Boundary, the former of which are sufficiently explained by the note prefixed to them. On the west line the 10 mile monuments were deemed sufficient. On the east line with posts on established marked & witnessed as directed in the field notes.

It will be perceived that the measurement of this line as run by us, exceeds that of Sullivan by 11 50/100 chains, & that this increase although gradual, is not regular. Some portions of the old line, agree very nearly with our measurement, while others differ materially. The greatest difference is found in Woburn & Lynnfield land.

For the convenience of estimating distances, & that the length of the line might be indicated by the mile posts, they were established by our measurement, taking care in every instance to note the distance of the posts set by us, from the corner preceding corners on the old line wherever found. The different courses being extended from one known point to another, the line was not altered at those points being made to pass through them, but only its length corrected.

The length of the entire line is 211 miles & 82 70/100 chains, embracing 4°. 1'. 7".29 of longitude. The length of a second of longitude is calculated in both C. and the longitude of any point of the line being known, that of any other point can be easily deduced.

The map is plotted from the field notes on a scale of half an inch to the mile, & is intended to represent only the general features in the topography of the line. The scale upon which it is made is much too small to show the angles in the east line, to do which would require it to be extended to a length that would render it inconvenient. All the purposes for which it can be used, will be attained by its present form.

Wm Hewes
Surveyor on the part of Town
B Walker
Surveyor on the part of the State