

Surveyor Letter from Messers, Hendershott and Minor in Keokuk, Iowa, September 20, 1850

Keokuk, Sept. 30th, 1850

Messers Hendershott and Minor,

Commissioners of the Boundary Survey,

Gentlemen,

Having been appointed by you on the part of the state of Iowa and Missouri severally to locate and the survey the boundary between those states under the decree of the Supreme Court of the U.S. we must, 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 General'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 terminus, we were able to determine the locality of the corner approximately; and an inspection of the grounds satisfied us that every evidence of its exact position had long since disappeared. Time and the fires that annually spread over the prairies had destroyed the witness trees and 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 1816 from the mouth of the Kansas River North 100 miles, and was the point at which he turned East in running to the Des Moines River, his miles being numbered North from the Kansas, and East beginning 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 as the corner and if Sullivan's measurement were correct, would be the precise spot he established it.

Near the supposed locality of the 99th mile corner on the North line, we found a decayed tree and a stump, which correspond in course, distance and description with the witness trees to that corner, and cutting into the tree we saw what we supposed to be the remains of an old blase (sic) upon which was preserved apart 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 one witness tree, which was perfectly sound. The mark upon it two or three inches beneath the bark were plain and legible.

On the East line we found the witness tree to the 3rd mile corner. The wood upon which the marks had been inscribed was decayed, but their reversed impression appeared upon the new growth which covered the old base (sic), and which was cut out in a solid block.

Prolonging the lines three miles each from the points thus determined, their intersection was assumed as the required corner, and at that point was planted the monument specified in the decree. By measurement made from the surveyed lines, we found the corner to be in the N.E. quarter of section 35 Township of North Range 33 West. Its exact position with reference to these lines can be seen in the diagram in the field notes.

The latitude of the corner, determined by a series of observations taken on the ground, we found to be $40^{\circ} 34' 40''$ North. While employed upon these observations, we were delayed by unfavorable weather, and it was not till the 24th of May that we were in [illegible] to commence the survey of the West line from the corner of the Missouri River.

This portion of the boundary, being required to be a parallel of latitude, was run with Burt's Solar Compass. The use of which requires the longitude of the place of observation to be at least approximately known. Not having the requisite means of ascertaining the longitude of the corner, we calculated it from maps to be about $94^{\circ} 30'$ West from Greenwich, which was sufficiently accurate for the purpose. The instrument used being an untried one, some delay was experienced in its adjustment. To ensure accuracy in the work, a telescope was attached to it.

The principles upon which this line was run involve a mathematical investigation, which will be found in note A. accompanying this report, but the mode of running it will be briefly described here – each [illegible] mile was prolonged in the plane of the prime vertical [illegible] through its beginning. The direction indicated by the instrument stationed at the beginning of a mile is in the plane of the prime vertical [illegible] through the mile by means of fore and back sights. At the end of the mile, an offset North was made to compensate for the [illegible] of the earth. This offset it will be seen by the note is 6.855 inches for one mile. The instrument being moved at the end of the mile, the proper distance North, and a new direction given and continued as before. The parallel [illegible] 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, instead of offsetting, to continue the same direction through several miles. It will be seen by the note, that the offsets increase as the squares of the distances, being for one mile 6.855 inches, for two miles, four times that distance [illegible]. Thus it appears that the offsets rapidly increase with the distance run, and that by continuing the direction of the prime vertical from the corner to the terminus, the something 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 and commenced retracing Sullivan's East line on the 13th of August.

It is thirty-four years since (Sullivan's) line was run, and every vestige of the mounds and pits established in the prairie has disappeared. Much of the country through which it [illegible] consists of brushy 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, and in others, brushy 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 and other remarks mentioned in Sullivan's field notes were gone, and thus it occurred that we frequently ran several miles without finding any traces 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 bases (sic), but by

line and witness trees, many of which are sound and the marks in good preservation. The general topography of the country, and especially the crossings of the streams, greatly facilitated us in following the lines, and in some instances, when confirmed by the old blases (sic), enables 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, and established our posts accordingly. This was done by running a random line from the last found corner, in a direction as near that pursued by Sullivan as we could determine, until another point was found, and 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 a due East line, but that it was not straight. That more or less northing should have been made in the old line, was to [page 12] have been expected from the fact that Sullivan ran the whole line with one variation of the needle, and that variation too great. This would account for the fact that the Northing increases as he progressed East. But there are great irregularities in the course of the line for which it is difficult to find a cause. Sudden deviations, amounting to from one to three degrees frequently occur, and it rarely happens that any two consecutive miles pursue the same direction.

A re-surveying of the line between the 91st and 134th miles was made in the year 1845, and we found the witness trees on that part of the line defaced and other substituted. We succeeded however in identifying Sullivan's trees, and we destroyed the marks of that survey as far as they related to the old line. In all instances where a corner on Sullivan's line is mentioned in our field notes, one or both witness trees were found to identify it and we did not always think it necessary to repeat the fact in the notes.

Accompanying this report are the field notes and map of the boundary, the former of which are sufficiently explained in the note prefixed to them.

On the West line the monuments every ten miles were deemed sufficient. On the East line mile posts are established marked and witnessed as described in the field notes.

It will be perceived that the measurement of this line as run by us exceeds that of Sullivan by 11 ^{80/100} chains, and that this increase although gradual is not regular. Some portions of the old line agree very nearly with our measurement, while others differ materially, and the greatest gain is generally made in brushy and broken land.

For the convenience of estimating distances and that the true length of the line might be indicated by the mile posts, there were established by our measurement, taking care in every instance to note the distance of the posts set by us from the corresponding corners in the old line, whenever 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 and 32 ^{80/100} chains, embracing 4° 1' 7" 29 of longitude. The length of a second longitude is calculated in note 6 and the longitude of any point of the line being known, that of any other point can be deduced.

The map is plotted from the field notes on a [illegible] of half an inch to the mile, and is only intended to represent the general features in the topography of the line. The [illegible] 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 [illegible]. All the purposes for which it can be used will be attained by its present form.

Wm Davey
Surveyor on the part of Iowa

R. Walker
Surveyor on the part of Missouri