Volume 28: Issue 1 January, 2017



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January 2017



PRESIDENT'S MESSAGE

Greetings,

Fellow members and associates of PLSW:

Here it is, a new year, 2017! Projects from the past year are wrapping up and the search for new opportunities are underway, hoping that the economy will be better and stronger

than it was during the past year. My reign as president of this great organization will be ending in a few weeks and thanks are in order to the directors and the entire membership for working as a team to better our profession. Karl Scherbel will be handed the gavel at our annual meeting in February and will be your next president. It's good to see the younger professionals stepping up to fill positions and provide a younger perspective.

The Fall Technical Session held November 3rd and 4th at the Parkway Plaza, Casper, Wyoming was nothing short of a success. I believe that the attendance was one of the largest ever. Thanks to Bill Fehringer for the fine work that he does every year to schedule good speakers with interesting topics and the general organization of this event.

The Legislature of the State of Wyoming will convene as a general session starting January 10, 2017. The PLSW legislative committee has started to review the House Bills and Senate Files that are of importance to surveyors and will present their findings at our annual meeting. You can easily locate Bill and File information on the Wyoming Legislature web site, if you want to get a head start on what is going on and the effects they will have on our profession. It appears that there are several on the list that are of interest to surveyors.

With this being my final presidential message, I would like to thank all of you for your support of PLSW and encourage you all to continue that support for the 2017 incoming officers and years to follow. We are a part of a profession with everchanging rules, regulations and technology that we must stay abreast of and with your dedication we will remain strong as a profession and society.

Be safe while working this winter, which seems to be colder and snowier this year, but it is Wyoming! I haven't seen the final schedule for the WES convention in February at the Parkway in Casper yet, but the Annual Meeting will commence at either 2:00 or 2:30 PM. Hope to see you there! Drive safe.

Randy Stelzner, P.L.S., CFedS

President, Professional Land Surveyors of Wyoming

Deuteronomy 27:17 Cursed is the man who moves his neighbor's boundary stone. Then all the people shall say, Amen!

ANINIOTINIOTAITENITO

ANNOUNCEMENIS			
2016 PLSW FALL TEC Vender Desc		IOLARSHIP RAFFLE RESULTS	Raffle Winner
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Responsible Chapter	First Call Date	Last Call Date	Publication Date
Southwest Chapter Northeast Chapter Northwest Chapter	THANK YOU!! March 1 June 1	(SEE "WHAT TO DO WITH FENC March 15 June 15	es" in this issue) April 1, 2017 July 1, 2017
The members of the Professional Land Surveyors of Wyoming would like to recognize the achievement of the following new Wyoming registrants: Robert Paxton Sheridan, WY SI 171		ATTENTION! SAFETY MANUAL FOR SURVEYORS	
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What To Do With Fences

† BIOGRAPHICAL SKETCH

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by Knud E. Hermansen † P.L.S., P.E., Ph.D., Esq.

ABSTRACT

One of the perplexing problems that land surveyors must face is what to do with fences. Fences are found on or near many boundaries, to include boundaries around woodland, farm, and residential lots. This article was written to provide some suggestions and guidance concerning fences (and for that matter walls, hedgerows, tree-lines, etc.). In particular, the legal significance, practical value, and responsible treatment of fences are examined in this article.

INTRODUCTION

Landowners generally hire surveyors, in part, to determine where they own – they want the surveyor to locate their ownership boundary. The surveyor, for their part, has been trained to reestablish the location of the boundary as described in the records; that is, the record boundary. Under ideal conditions, the record and ownership boundaries will coincide and the surveyor will meet the client's expectations. A problem arises when the landowner or their predecessor in possession has asserted a claim, as evidenced by prior use and possession, short of or beyond the record boundary -- creating a third category of boundaries known as the possession boundary. Where the extent of use or possession does not coincide with the record boundary, the location of the ownership boundary becomes uncertain since it may coincide with either the record or the possession boundary.

Within this realm of potential confusion stands the fence, sometimes an aid while at other times the nemesis and gist of the problem. The resolution of the confusion depends on the legal significance, practical value, and responsible treatment of the fence. Unfortunately, the confusion is compounded by serenity and fed by ignorance. By its protruding appearance in the woods, along a field, or between homes in a development, a fence seems to make what would ordinarily be uncertain, certain. For the surveyor to interrupt the serenity by casting doubt on its position or prestige as a boundary marker seems sanctimonious if not an outright declaration of mistrust that is bound to start a bitter boundary dispute between the neighbors. For this reason and others, surveyors are quick to adopt a fence, reluctant to question a fence, ignorant about the legal ramifications, or are simply uncertain about how to handle fences that are on or near boundaries.

The legal significance, practical value, and responsible treatment of a fence can be determined by three steps. The three steps are to: (1) gather information, (2) analyze the information, and (3) apply or communicate the information.

GATHER INFORMATION

The first step to determine the legal significance and practical value of the fence is to gather information on the fence. During the course of the survey, information on the fence can be gathered during the record search, interviews, and field survey. While searching the records for boundary information, the surveyor should determine if any documents cite or portray the fence in a manner that is suggestive of an intent to fix the record boundary along the fence. Any citations to a fence should be scrutinized to determine: (1) the time the fence was built; (2) the fence material, (3) the direction of the fence, and (4) the location of the fence.

Information is also obtained from interviews with the client, neighbors, long-time residents, and other knowledgeable people. During the interview, the surveyor should gather the following information: (1) the maker/builder; (2) builder's frame of mind, purpose, and apparent significance of the fence (e.g. cattle barrier, line fence); (3) approximate age; and (4) past condition of the fence.

Finally, information on the fence is obtained during the field survey (to include the reconnaissance). The most important piece of information to obtain during the field survey is the relative location of the fence with respect to other evidence. This would include any significant meanderings and the geometrical relation between the fence, existing monuments, and major features. In addition, the surveyor should also attempt to collect the following during the field survey or reconnaissance: (1) continuity of the fence (e.g. sporadic, continuous); (2) present condition of the fence (e.g. disrepair, decayed, new); (3) actual age of the fence (i.e. from tree borings); (4) fence material (e.g. woven wire, split rail); and (5) visibility of the fence.

ANALYZE THE INFORMATION

The second step is to analyze the information. The analysis should attempt to classify the fence as one of the following: (1) the best evidence to the record boundary, (2) evidence to the record boundary, or (3) no correlation to the record boundary.

Best Evidence: The fence may be the best evidence of the record boundary under one or a combination of two or more of the following: (1) rules of construction; (2) recognition/ reputation; (3) process of elimination; and (4) prima facie assumption.

Best Evidence - Rules of Construction: The rules of construction would favor the fence as the best evidence to the record boundary under two different scenarios. The most favorable scenario is when the fence is called for in a valid conveyance, cited in an authoritative record as a monument to the boundary, or constructed as a division fence according to a "fenceline" statute or boundary agreement.¹ The second, less favorable scenario is to determine the fence is in privity and conformance with the location of the original marks and monuments.² Privity stands for the concept that there exists some chain of records, evidence, logic pattern, or other rational explanation that places the fence in the same stead as the original marks. This scenario would be appropriate if the fence were built along the blazed boundary, fence posts replaced the corner marks or monuments (e.g. stakes), or the fence replaced or stands in the place of an earlier fence that was called for as a monument. Under these scenarios, the fence is favored much the same as other monuments are favored under boundary law rules of construction.³

Best Evidence - Recognition/Reputation: A second way a fence may be the best evidence of the record boundary is by recognition and reputation. This concept treats the fence as an "undocumented" monument with authority based on its recognition and reputation. Recognition and reputation as a boundary or "line" fence is based in part on equity and in part on logical assumptions. Equity by way of laches, estoppel, and other equitable principles, would keep settled what has been settled. With the same results, a logical analysis could be constructed to show that the recognition and reputation of a fence as a boundary marker must have been based on some authority since obscured or some intent expressed and accepted long ago.⁴

Best Evidence - Process of Elimination: Recognition and reputation are usually combined with the process of elimination (although not always). The process of elimination, simply described, is that there is no better evidence available to prove the fence does not stand on the record boundary. What better evidence that may have once been available is now unavailable, lost, or suspect. In some cases, there may never have been better evidence other than the fact the people living along or near the fence have always supposed and accepted the fence as the boundary marker.

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Best Evidence - Prima Facie Assumption: By way of a primae facie assumption, some courts will assume at the outset that the location of an existing fence accurately marks the location of the record boundary.⁵ To understand this concept, recognize that under the previous methods of interpretation, judges would ordinarily reserve judgment until the party with the burden of proof produces sufficient evidence to show that the fence marks the boundary or the moving party, by a preponderance of evidence, shows the fence in all likelihood coincides with the record boundary. However, if at the outset of the trial the court adopts a prima facie assumption in favor of the fence, the court assumes that the fence marks the location of the record boundary unless other, better evidence is introduced by the opposing party that shows it does not. This last assumption is founded partially on convenience and partially on the premise that: (1) the builder knew where the record boundary was located, (2) the record boundary was discernible to the builder at the time the fence was constructed (e.g. blazed trees), and (3) the builder followed the marks in constructing the fence.⁶

Best Evidence - Prima Facie Assumption (Modified): As a slight modification to the best evidence by prima facie assumption, some courts do not use a prima facie assumption until the fence is shown to have existed undisturbed and uncontested for a period exceeding the statute of limitations (Acquiescence).⁷ This is based on the premise that any fence that has been allowed to stand uncontested for a long time must have been built on the record boundary or else someone should have come forward to dispute (i.e. litigate) its location before the present time. If the fence is shown to have existed for a long time without question or conflict, the opposing party has the burden of coming forward with evidence (not the same as the burden of proof) to show the fence is not on the record boundary.

Evidence: The fence may be classified as evidence (as opposed to the "best" evidence) to the boundary when the fence supports other comparable or better evidence to the record boundary. This classification uses the location of the fence as one piece of evidence among many (e.g. other undocumented monuments, measurements, area, and parol testimony) to help fix the record boundary. Naturally, the evidentiary value of the fence can be improved or minimized by proving or failing to prove such factors as: (1) the fence was built at a time when marks and monuments to the record boundary

still existed; (2) the person constructing the fence was a disinterested party and intended to set the fence on the record boundary; or (3) the fence was constructed by previous landowners to stand on the common boundary between them.⁸

No Correlation To The Record Boundary: By eliminating the possibility that the fence is the best evidence or, less favorably, evidence to the boundary, the surveyor is left with the last possibility -- there is no correlation between the fence and the client's record boundary. In other words, the fence represents the position of another record boundary or a possession boundary not related to the client's record boundary -- possibly creating a cloud on the client's or neighbor's title. Estoppel and adverse possession are two common legal doctrines where a fence, standing as a possession boundary apart from the client's record boundary, may alter the client's rights and cloud the record title.

Estoppel: Estoppel is a legal doctrine that denies a person a legal remedy that would ordinarily be theirs to claim. With estoppel, one landowner is denied the right to claim to their record boundary and the other landowner has the right to claim to the fence lying beyond their record boundary. Estoppel arises when one landowner, by design or innocence; by action or, in some cases, acquiescence (e.g. where the landowner had a duty to assert the truth and did not); it leads another to that person's detriment; to believe that the fence controls or stands in the location of the ownership boundary.⁹ Examples include an oral agreement followed by possession;¹⁰ acquiescence coupled with possession; and detrimental reliance.¹¹ Estoppel, by itself, does not ordinarily create title until adverse possession is maintained for the time period prescribed by the statute of limitations.¹²

Adverse Possession: Adverse possession is a legal doctrine that creates title in a possessor. Most states recognize adverse possession through statute or common law. Under the common law, adverse possession is founded on the premise (i.e. legal fiction) that any long possession must have been founded on a grant that has since been lost (i.e., lost grant theory). A person asserting title by adverse possession must prove the following six elements (although different jurisdictions may require more, less, or slightly different elements depending on the circumstances): (1) the land was held adverse or hostile to the record owner's title; (2) possession has been actual (v. constructive); (3) it has been open and notorious (i.e., visible and known); (4) possession has been exclusive or the use by others has been controlled by the possessor; (5) possession has been continuous for the period set forth in the statute of limitations; and (6) possession has been under claim-of-title or color-of-title.¹³

Other Record Boundary: A fence standing apart from the client's record boundary may also represent another person's record or ownership boundary (e.g. the neighbor's). In some cases, this may result in a gap between record titles, while in other cases it may result in an overlap of record titles. In any event, a question of title is usually involved. In most of these cases, the surveyor should treat the fence as an encroachment on the client's title or a possessory claim for the client.

Apply or Communicate the Information

The last step is for the surveyor to apply the information or communicate the information along with his or her analysis and opinion to the client. This step focuses on the proper treatment of the fence. Generally, if the surveyor determines that the fence is the best evidence or, in the alternative, evidence to the boundary, the surveyor uses the fence to help fix the location of the record boundary. In contrast, if the surveyor determines there is no correlation between the fence and record boundary, the surveyor should communicate this information to the client along with the legal ramifications that may result or may have occurred.

Fence as the Best Evidence: If the fence is the best evidence to the record boundary, the fence is used to fix the location of the record boundary. This normally requires the record boundary coincide with the location of the fence (even though the fence may deviate from a straight line).¹⁴ This conforms with the rule of construction that generally holds monuments superior to measurements (i.e. straight lines) should they conflict. Furthermore, the call for a monument is a call for the center, where it stood at the time the original description was prepared.¹⁵

Fence Used As Evidence: On the other hand, if the surveyor has determined the fence is evidence to the record boundary, the fence usually falls partly on the boundary and partly off from the record boundary. The fence is used as one piece of evidence among others to relocate where the corner monuments or the record boundary once stood. All evidence, including the fence location, is analyzed and used in the most favorable light (i.e. they conform rather than conflict), keeping in mind the conditions and situation at the time

of the conveyance. As evidence (as opposed to the best evidence) of the record boundary, the record boundary will not be made to follow the meanderings of the fence. Since the fence will not ordinarily coincide with the record boundary along its entire length, one of two different interpretations are used to reestablish the record boundary.

Under one interpretation, only part of the fence is used to help fix the corner locations. This interpretation assumes the builder attempted to place the fence on a straight line between two corner monuments, starting at one corner and building the fence toward the other corner. As he moved away from one corner monument and was out of sight of the other corner, the direction of the fence deviated from a direct line between the corners. However, once he came close enough to the other corner, the fence builder was able to visually correct his direction and head more or less back toward the second corner. The result is that the fence, as it stands, "bows" or "curves" away from the record boundary (i.e. a straight line). Therefore, under this interpretation, only the end segments of the fence would be used to help fix the location of the property corners. Once the corner locations are reestablished, a straight line is protracted between the corners and any deviation of the fence from the straight line is treated as an encroachment or adverse claim, as the case may be.

Under a second interpretation, the fence builder is assumed to have stayed on or near the boundary, sometimes going off to one side and at other times crossing and going off to the other side -- crossing and recrossing the record boundary. In other words the fence zig-zags along the length of the record boundary. Given this interpretation of the fence construction, the record boundary is located by projecting a "best fit" straight line along the fence (i.e. a least squares best fit). In other words, a straight line is chosen for the record boundary that minimizes the deviations of the fence from the record boundary.

It should be noted that one interpretation does not necessarily always have to be favored over another. The existing pattern of the fence location (bow v. zig-zag), the character of the corner marker (e.g. stream or road v. tree or ridge), and the character and frame of mind of the builder (conscientious v. noncaring) will influence whether the first or second interpretation is chosen. For example a bow in the fence line would tend to fit the first interpretation while a fence that zig-zags would fit the second interpretation. On the other hand, if the fence builder was heading toward a linear monument, a monument not easily visible to the builder, there is less reason to choose the first interpretation. In contrast, if the builder had a tall tree or point on a ridge that was generally visible along the entire boundary while the fence builder constructed the fence, there is a good reason to choose the second interpretation since the builder would have been able correct the direction of the fence from time to time.

Fence Does Not Coincide: In almost all cases where the record boundary and possession boundary (fence) do not coincide, the surveyor should not ignore the difference or attempt to solve the problem independent of written authority to do so.¹⁶ Where the client's record boundary is in a different location than the possession boundary, the question of what is the (ownership) boundary becomes a question of law. The surveyor's responsibility is limited to showing where the boundaries are located, which is a question of fact. As one early practitioner said in the 1800s: "Old fences must generally be accepted by right of possession; though such questions belong to the lawyer [rather] than to the surveyor."¹⁷

In this situation, the surveyor has a duty to inform the client of any problems that may affect his or her title. Thereafter, it is the client's problem and prerogative to ignore or take steps to remove the problem affecting their title. If the surveyor fails to properly inform the client or, in the alternative, attempts to decide title questions on his or her own, the surveyor will increase their liability considerably.

Unfortunately, many surveyors find it difficult to come to the client with a potential title problem they have discovered and are unable to solve. In real life, the client is not happy to find out they have a problem, is annoyed that the surveyor cannot solve the problem, and, on top of it all, is mad at the surveyor for demanding to be paid. However, the fault is not with the surveyor because he or she identified and described the problem; the fault is with some prior landowner who failed to have the property surveyed and subsequently failed to build the fence on the record boundary.

If the surveyor should determine a fence does not coincide with the record boundary, the surveyor should take several actions on behalf of their client: (1) The surveyor should carefully locate where the fence stands and describe the fence in relation to the record boundary. (2) The surveyor should describe and document all evidence that would support or refute a possessory claim on

Continued on Page 24



Lines & Points



Lawrence Todd (PCHPC), Kyle Wright (Shoshone National Forest), and Ron Ostrom(Shoshone National Forest)

ABSTRACT

Before the establishment of the National Forests, efforts to manage forest lands took several forms, including the Forest Reserve Act of 1891, which established a number of Forest Reservations. One of these became known as the Yellowstone Forest Reserve and eventually became part of the Shoshone National Forest in NW Wyoming. In 1893 a survey party led by P.M. Gallaher, Montana US Deputy Surveyor completed a boundary survey of the east and south sides of a timber reserve that surrounded Yellowstone National Park. While marking bearing trees and witness trees was part of their day-to-day activities, the team also left an unusual inscribed tree commemorating their efforts in what is today the Washakie Wilderness. Documentation of this, and three other inscribed trees on site 48PA3471 provides a record of changing perspectives on land management in the western United States.



Site 48PA3471 near red star

(source: http://www.wy.blm.gov/cadastral/countyplats/fremont/t46nr105w.pdf.

INTRODUCTION

Following the establishment of Yellowstone Park in 1872, some lands in what today is designated the Greater Yellowstone Ecosystem (GYE) were administered bv number of Federal laws. Two laws enacted in 1878 - the Timber and Stone Act and the Free Timber Act - set the stage for subsequent legislation that led to development the of the Forest Service as part of the Department of Agriculture. In particular, the Free Timber Act "provided that residents of the Rocky Mountain states Colorado, Nevada, New Mexico, Arizona, Utah, Wyoming, Dakota, Montana Idaho, and timber might cut

on mineral lands, for building, agricultural, mining, or other domestic purposes, subject to such regulations as the Secretary of the Interior might prescribe" (Ise1920:62). Since the wording of the act was fairly vague, particularly in terms of the meaning of "on mineral lands," enforcement of was difficult and in his 1878 report Secretary of the Interior Schurz stated that "[t]his bill is equivalent to a donation of all the timber lands to the inhabitants of those states and territories. The machinery of the Land Office is wholly inadequate to prevent the depredations which will be committed." Secretary Schurz foresaw the same results;" It will stimulate a wasteful consumption beyond actual needs and lead to wanton destruction," he said, "for the machinery left to this department to prevent or repress such waste and destruction through enforcement of the regulations, will prove entirely inadequate, and as a final result, in a few years the mountainsides in those states and territories will be stripped



F1, the Gallaher Party tree is inscribed in what appears to be a fire scar.



(F1-4) as well as more recent hearths (F5).

bare" (Ise1920:66). Over the following decade, Schurz's concerns were demonstrated to be well founded and need for better forest management was clear and in 1891, Section 24 (Forest Reserve Act) of the General Revision Act "provided that the President might from time to time set aside forest reservations in any state or territory having public lands wholly or in part covered with timber or undergrowth. This provision, definitely providing for national ownership of forest lands, a complete departure from the forest policy hitherto pursued, is by far the most important piece of timber legislation ever enacted in this county" (Ise1920:109). Less than a month the Forest Reserve Act, President Harrison "proclaimed the Yellowstone National Park Reserve, adjoining Yellowstone Park in Wyoming, and in September of the same year added still another section to the reserve, giving it an area of over a million acres" (Ise1920:120).



THE GALLAHER SURVEY

Almost immediately after the Wyoming Reserves were established, the Department of Interior contracted for the arduous task of conducting a survey of the new Reservations. As reported in the 1894 Report of the Secretary of the Interior:

YELLOWSTONE NATIONAL PARK AND PUBLIC FOREST RESERVATION IN WYOMING.

Contract No. 263, dated October 17, 1891, was awarded by the U. S. surveyor-general for Montana to Phillip M. Gallaher, U. S. deputy surveyor, providing for the survey of the eastern and southern boundaries of the Yellowstone National Park, in Wyoming, and the lines of the public forest reservation

east, south, and adjoining the park, as reserved by the President's proclamation of March 30, 1891. Said contract was formally approved June 3, 1893, in pursuance of directions from the Department.

The survey of the north, east, and south boundaries of the public forest reservation was executed by the contracting deputy during the months of July, August, September, October, and November, 1893, and a field examination of the work in the field was made during the fall of 1893 by an examiner detailed from this office who completed the examination of the west and north boundaries and of the east boundary to within 3 miles of the northeast corner, when inclement weather prevented further progress. The report of said examination is now pending in this office.

Feature 2

Feature 4



Feature 3



Field Assistants for 1893 Survey Names and Duties of Assistants Charles La Blanc Chainguan Suc & Shaw Chamsenan Plannee & Fraker Chausenan Plas L. Sawner Chamman John Stariday Avena Soseph Willey areneau Field Assistants for 1894 Supplemental Survey Names and Duties of Assistants. These Cherry Chain Suna Lega alenne J. Ley John I Arich William Of Billion (11.m

Signatures of assistants oaths for 1893 survey and 1894 supplemental survey.

With the letter from the U. S. surveyor-general for Montana, dated July 17, 1894, were transmitted to this office the returns of the survey by Deputy Gallaher, as executed under his contract No. 263, and the same are now awaiting an office examination, in connection with the report of the detailed clerk as to the field work.

Pending legislation in Congress contemplates the reduction of the limits of the public forest reservation on the north and east sides, thereby relieving certain mining and homestead parties whose claims are now situate within the original limits as proclaimed and reserved. (pp 64-65).

As the survey party was assembled in July, 1893 four chainmen **Charles La Blanc, Jno(John) E. Shaw, Clarence T. Foraker, and Chas. L. Sawyer** signed the oath to "swear that we will well and faithfully execute the duties of chain carriers; that we will level the chain over even and uneven ground, and plumb the tally-pins either by sticking or dropping the same; that we will report the true distances to all notable objects, and the true lengths of all lines that we assist in measuring, to the best

This point is on the top of Saddle countries, a wary sizescall one to scale, and the line from the station towards toth the part and west despends (should personalicularly over granite sloops that cannot as traverand) on the east into the canyou of Saidle creak, and up the wort into the youth fork of Unlakingwater piver, 5000 ft, below the Loosing towards the west, on the line as it will approximately Tay, 7 find that it will not be possible to establish corther point with served the river in the canyontelos, for a very long distance, as the sourtains to the sast of the "ticking satur eiver are equally as high as the one I as new od, and cannot by scales. Having siresty investigated the country shear I as astisfied I shall not by able to establish a point on line except at a firture. considerably away " miles, the distance for which the data farmines as is intenied to be used under the passart meteor of running parallels, and as I have no data methorized by abo instructions by shick longer triangulations than " wiles may be made, I find arguelf is a dilense which I dan tee at way but af except to fall back on the old wathed of running excaltols of latitude given in the Manual, of Curvering, a copy of which I have with us. I can astablian acts surgers bolow in the engyph of the south form of the Stinkingenter river from this point on top of Saidle uncotain, but the mountains went of the river are very high and predipitous and cannot be traversed. I am therefore compelled, at this point at least, to abaning the secant system and adopt that of punning a tangent to the parallel of institute as into down in the Vanual of instructions.

Gallaher's field descriptions of difficulties in surveying in the 48PA3471 area.

of our skill and ability, and in accordance with instructions." The two other signatories to the "oaths of assistants" were **John Sheridan and Joseph Willeyas** axmen. Based on standard survey practice of the time, other survey team members could have included flagmen, and moundsmen, neither position being required to sign oaths.

The Gallaher party began by establishing a base point at Yellowstone Lake on 3 August, 1893. By late September, the survey had completed the eastern boundary and begun moving westward along the southern boundary of the Public Forest Reservation and were encountering very rugged terrain making survey difficult. By early October, they were working along the western slopes of the South Fork of the Shoshone River country that was "extremely rough and broken, and were further delayed by inclement weather that warranted a five day delay in fieldwork. Gallaher

January 2017





wrote in his field notes (p. 158) that "A heavy snow storm prevailed during the 3rd, 4th, 5th, 6th, and 7th of October without interruption day or night, rendering it impossible to take a sight or do any work, and making it necessary to gather boughs to feed the pack stock. During this time I camped on the head of a small stream about ½ mile south of the flag at Sta. K, at an altitude of 10,500 ft. The snow fall at this time was in the neighborhood of 5 ft. Arriving at the flag at Sta. K on the morning of October 8th1893, I found it marked by an X cut in the rock by my flagman."

SITE 48PA3471

Accounts of a marked tree in the Washakie Wilderness, Shoshone National Forest prompted a visit to a high mountain meadow by fire personnel during the 2013 Hardluck fire. A subsequent monitoring visit by Ron Ostrom in 2015 provided clear photographic images of the marked trees, and provided a definite link between this location and the Gallaher survey. In September, Ostrom guided Shoshone Forest archaeologist Kyle Wright, and PCHPC chair Larry Todd to the site to provide basic documentation and complete a Wyoming Cultural Properties form. In addition to the Gallaher Party tree, which was dated to October 3, 1893 (and thus to the period of snow storm interruption described above), there are 3 other scribed or incised trees. One of theses (Feature 2) is possibly from the Gallaher 1894 supplemental survey (August 26-September 22) along the same line, and two others are likely later, and perhaps into the early 1900s.

This site provides tangible evidence of the Gallaher party's boundary survey and is significant bit of physical evidence of the development and changes to management of public lands in the United States.

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Gallaher Survey notes: http://www.wy.blm.gov/ cadastral/countyplats/park/fieldnotes/ynp_0013fn.pdf

ACKNOWLEDGEMENTS: Park County Commissioner Lee Livingston provided initial information on this site and has been instrumental in its documentation. Kim Crawford (BLM) was very helpful in acquiring the Gallaher Survey field notes.



48PA3471 (2013 air photo as part of Hardluck Fire management, and 2016 archaeological documentation).

> Contact information: lctodd@colostate.eduor kdwright@fs.fed.us



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Geodetic Surveying: Part X

Ferdinand Rudolph Hassler and the U.S. Coast Survey: Part 2 Herbert W. Stoughton, PhD, PELS, CP

Part 1 of this treatise about F.R. Hassler ended with Congress terminating the Coast Survey (14 April 1818). Hassler accepted President Monroe's offer of a position on the survey of the 45th parallel across northern Vermont and northern New York to the St. Lawrence River. Immediately, Hassler was involved in a controversy. He and the British surveyor/astronomer Dr. John Louis Tiraks (the same individual involved in the controversy about Isaac Dalby's Theorem with Mr. Ivory, and appearing in the Proceedings of the Royal Society) jointly agreed that the 45th parallel was approximately one mile further south than previously determined. Hassler was accused of "being corrupted during the survey", to which Secretary of State John Quincy Adams replied, ". . . found that it was mere unwarranted suspicion. ... But, Hassler, so far from favoring the British side on the matter had first started the claim of determining the latitude geocentrically, with the allowance for the difference between the polar and equatorial diameters of the earth." This argument was incomprehensible to politicians who had little or no understanding of mathematic/scientific matters. This problem would not be resolved until approval of the Webster-Ashburton Treat (1842).

After thirteen months employment on the US -Canada boundary survey, in a controversy over salary, Hassler resigned. Hassler's departure from Federal employment did not dampen his personal commitment for the Coast Survey. He compiled the correspondence (verbatim) between himself (Hassler) and various officials. Table 1 is a synopsis of these documents.

The last communication was transmitted to the American Philosophical Society under the title "Papers on Various Subjects Connected With the Survey of the Coast of the United States." This document was published in Transactions of the American Philosophical Society; V. 2, N.S.; 1825 (pp. 232 - 420). Hassler's "papers" were not only the documents contained in Table 1. This document presented the basic tenets/ philosophies for (1) the Coast Survey; (2) the Bureau of Standards (NIST); (3) a national astronomic observatory (Naval Observatory); and (4) the U.S. Geological Survey national mapping division (Topographic Division). Every one of these elements became established entities by 1890, and would "grow" to become world leading institutional agencies in their respective disciplines by 1920. It was in this document that an extremely complex and intricate agency for mapping, charting, positional astronomy, and metrology was defined and organized.

In this document, Hassler introduced the plane table as a primary mapping instrument. The plane table had been used in medieval Europe to execute boundary and estate surveys (see E.G.R. Taylor; Rathbone; Gunter, etc.). However, the acceptance of the plane table to support geodetic and associated topographic surveys/mapping was only known to a few geodetic/topographic Although some readers might practitioners. consider Hassler's opus sometimes rambling, the document definitively addressed geodesy, mapping, metrology, astronomy, accuracy, and a number of lesser topics which would be needed to establish and operate first class programs of international caliber in astronomy, geodesy, metrology, and national mapping. Undoubtedly, the literary style and format can be attributed to the fact that English was not Hassler's native tongue, and that his formal education had been in French and German.

The magnitude and scope of this document cannot be completely detailed herein. It contains field instructions, detailed descriptions of instruments, and examples of calculations. RADM Charles Wilkes, USN, studied under Hassler, and was thoroughly convinced that Hassler's technical approach to charting the coasts was the correct approach. Wilkes even retained and referred to Hassler's writings as the definitive instruction manual on the subject.

On 9 December 1826, Col. Isaac Roberdeau (U.S. Army Topographic Engineers) addressed



the Columbia Institute of Washington, D.C. (text published on 1 January 1827, in the Daily National Journal). Roberdeau proposed that if the survey of the coast was resumed, then the work should be under the direction of the Topographic Engineers, with assistance from the U.S. Navy. Furthermore, he suggested that civilians were unfit to undertake and direct such an endeavor. He stated: "... there would be no concentration or command, or obligation to duty, otherwise than arising from personal motives; when the service led to places prejudicial to health, or otherwise inconvenient, disagreeable, or hazardous, obedience might, and probably be refused ...".

Hassler did not accept Roberdeau's rebuke lightly, and launched a strong defense. On 3 December 1825, Hassler received a personal letter from former President Thomas Jefferson, just before Jefferson's death. Jefferson wrote, "I regret much that it (the Survey of the Coast) was not carried into execution, as, independently of the permanent security it would have procured for the navigation of our coast, it would have been an honorable monument of the state of science of this early period of our history." The National Daily Journal would not publish Hassler's rebuttal, but it was published in the New York American. Hassler addressed the matter of "military and naval officers, on the grounds that they would never obey civilian directions." He wrote, "I am reluctant that this be a fair statement of the views and character of our republican military." Hassler continued, ". . . that blind, and even ignorant, obedience and strict discipline may suffice for common military purposes, while in scientific work only actual zeal and scientific interest for the object in view, decide the fitness of the man: ideas of private interest, false honor and presentations, are, in their nature, foreign and directly inimical (hostile) to such a work, and do not even occur to the man fit for it."

The publication of Hassler's rebuttal received the wider readership of a large metropolitan newspaper. Besides complimentary reviews in the European scientific community, Frederich Bessel stated in Astronomische Nachrichten (V. 5, p. 396), "It is to be lamented that such a complete apparatus as that now on hand in America has not been applied according to its intention and by its author." Also, Hassler was offered a large salary to accept a position in Russia. He responded, "In money, Sir, I do not get paid here, but I shall accomplish as invaluable labor for this American Republic that shall never perish. That Count (Zschokke, Ambassador to the U.S.), is better than money. Roberdeau's paper and Hassler's rebuttal were the turning point. He developed strong personal and professional relationships with Professor James Renwick (Columbia University) and Lt. Charles Wilkes, USN.

After resigning from the U.S. - Canada boundary survey (1819), Hassler purchased a farm near Cape Vincent, New York. In 1823, his wife packed her bags and moved to the home of friends in New York. She and Hassler only saw each other on one occasion after this incident.

Hassler wrote most of his text books in French. Professor Renwick translated Hassler's writings into very good American and English languages. He would also serve as spokesman for Hassler and his methods relating to the Survey of the Coast. Elements of Analytic Trigonometry, Plane and Spherical was published in 1826. On page iv, the author profusely acknowledged Professor Renwick's efforts to translate the French manuscript into suitable English. In the next four years, Hassler wrote: Elements of Arithmetik, Theoretical and Practical (1826); Elements of Geometry of Plane and Solids (1828); Logarithmic and Trigonometric Tables (1830); and A Popular Exposition of the System of the Universe with Plates and Tables, 2 volumes (1830). The mathematical works and the tables were considered leading text books and references for the era.

Lt. Wilkes hired Hassler between 1825 and 1828 as a personal tutor in mathematics, geodesy, and other physical sciences. He later wrote, "Being a pupil of his on and off for about three years, I had a great trial of patience when I found him in one of his stolid bad humors, yet I esteemed him highly . . . He was often like a wayward child; nothing would please him and the only way I had to do was feign myself in a passion and retort upon him, which usually brought him to himself --but I bore much before I discovered this mode of treating his temper."

In the late summer of 1829, Hassler was appointed "gauger" in the New York Customs House. Since Hassler had a well deserved reputation as a metrologist, he was appointed the first Superintendent of the Office of Weights and Measures (later known as the National Bureau of Standards, and still later as the National Institute of Science and Technology). Immediately, he instituted a program to compare the weights and measures of the various custom houses. The project faced an immediate set back, when the ship transporting the scientific apparatus from New York to Washington was stranded on an uncharted reef and the instruments were lost. Later when comparisons were completed it was found that the Custom House standards were very irregular. The only measure of the yard nearest in agreement with the standard was a folding yard stick from Philadelphia (36.0002 465 standard inches). Hassler spared no effort in sorting out and systematizing the intricate aspects of weights and measures. The result of this investigation produced a monumental opus titled: Weights and Measures: Report from the Secretary of the Treasury in Compliance With a Resolution of the Weights and Measures in the Several Custom Houses in the United States, & c. (Doc. No. 299, H. of Representatives, Treasury Dept.; 32nd Congress, 1st Session, July 2, 1832, 122 pages).

Hassler's interest in astronomy and surveying never waned. On 12 February 1831, Hassler observed an eclipse of the sun "under the colonnade of the south front of the President's house at the city of Washington." He would subsequently author the paper "Results of the Observations of the Solar Eclipse of 12 February 1831..." (Transactions of the American Philosophical Society, N.S., V. 4; p. 131).

Although Hassler's appointment as Superintendent of the Office of Weights and Measures was during the term of the current resident of the White House, it is unknown if the two individuals had every previously met. But, undoubtedly during the preparations for the eclipse, Old Hickory, President Andrew Jackson, exchanged pleasantries about the needs of an accurate survey of the coast. President Jackson would have had intimate knowledge of Hassler's

Table 1

Correspondence Between Hassler and Others (Between 11 June 1816 and 16 February 1820) Date / Author / Addressee / (Topic)

11 June 1816 / FRH¹ / A.J. Dallas, S.T.² / (*Terms of employment as superintendent of the Coast Survey.*) 18 June 1816 / A.J. Dallas, S.T. / FRH / (*Offer of employment.*)

21 June 1816 / FRH / A.J. Dallas, S.T. / (ACCEPTANCE OF EMPLOYMENT.)

12 July 1816 / FRH / _____ Jones, T.D.³ / (*Transmission of signed articles of engagement between FRH and Treasury Department were attached*)

3 August 1816 / A.J. Dallas, S.T. / FRH / (TERMS OF ENGAGEMENT FOR SERVICES; COPY SENT TO ROBERT PATTERSON, DIRECTOR OF THE MINT.)

18 August 1816 / FRH / A.J. Dallas, S.T. / (Addressing Administrative matters.)

5 November 1816 / Joseph G. Swift / FRH / (Addressing Administrative MATTERS.)

23 November 1816 / FRH / Wm. H. Crawford, S.T. / (First report of the Coast Survey.)

30 November 1816 / Wm. H. Crawford, S.T. / FRH / (ACKNOWLEDGES RECEIPT OF PREVIOUS LETTER.)

18 December 1816 / FRH / Wm. H. Crawford, S.T. / (Request for funds and proposed work effort.)

3 April 1818 / FRH / Wm. H. Crawford, S.T. / (Request for funds; completed triangle computations; and

COMMENCING LMZ COMPUTATIONS. ANNOUNCES COMPLETION OF COMPUTING PROJECTION TABLES FOR DRAFTING.)

6 April 1818 / Wm. H. Crawford, S.T. / FRH / (Acknowledges receipt of letter and announces Congressional concern with survey's progress.)

9 April 1818 / FRH / Wm. H. Crawford, S.T. / (Report: Describes the efforts since 1807.)

14 April 1818 / FRH / Wm. H. Crawford, S.T. / (Letter defending arrival in Washington to defend report of 9 April 1818.)

22 April 1818 / FRH / Wm. H. Crawford, S.T. / (Letter proposing concluding administrative activities of the Coast Survey.)

27 April 1818 / FRH / John C. Calhoun. S.W.⁴ / (Letter proposing transfer of instruments and documents.) 16 February 1820 / --- / (List of principal dates of the survey of the coast.)

Notes: ¹ FRH - Ferdinand Rudolph Hassler / ² S.T. - Secretary of the Treasury. / ³ T.D. - Treasury Department. / ⁴ W.D. - War Dept.



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credentials as he, Hassler, was deeply involved in resolving the problems in the custom houses' standards.

In 1832, the administration submitted draft legislation allowing employment of civilians on the survey of the coast. During the ensuing debate in the house of Representatives, Rep. Aaron Ward, New York, (served 3/4/1825 -3/3/1829; 3/4/1831 - 3/3/1837; and 3/4/1841 - 3/3/1843) (b. 7/5/1790 - d. 3/2/1867), attacked Hassler and the conduct of the earlier survey on the House floor on 29 May 1832. Ward was born in Westchester Co., New York. He completed preparatory studies at Mt. Pleasant Academy, and completed his legal studies in Oxford, New York. He served as a lieutenant in the War of 1812, and became a captain in 1814, He joined the state militia, and eventually attained the rank of major general. After the War of 1812 he was admitted to the Bar, operating a law office in his home town, Ossing, New York. No where in his career did Ward have any education or training necessary to survey the coast. His remarks contained significant inaccuracies and innuendos.

Hassler, as was the case in his 1825 opus published in the Transactions, wrote a detailed response citing the facts. The document was published in the Washington Globe on 18 June 1832. Fortunately, Rep. Ward read the statements from Hassler. Ward immediately agreed to correct his original remarks when the matter again came up in Congress. On 10 July 1832, the act governing the Survey of the Coast was again modified to permit civilian employees.

Hassler was now ready to pursue his lifelong ambition of completing a survey of the coast.





Continued from Page 10

behalf of or against their client. (3) If the area is not inconsequential ("de minimis non curat lex"), the surveyor should calculate the area for the client. (4) The client should be notified of the possible adverse or beneficial consequences that result when the possession boundary does not coincide with the record boundary. (5) Finally, the surveyor should suggest some possible actions the client should consider and discuss with his or her attorney. These include: (a) do nothing, (b) maintain the status quo, (c) negotiate and compromise with the neighbor (e.g. boundary line agreement), (d) recognize any adverse claims, (e) arbitrate, or (f) litigate.

CONCLUSION

A fence is a common object found on or along boundaries. The surveyor should not ignore a fence since the fence may be evidence of the record boundary or, in the alternative, may represent a possession boundary that extends or usurps (i.e. clouds) the client's title. It behooves the surveyor to determine the relative location of the fence, who built the fence, when it was erected, the conditions under which it was erected, the manner in which it was erected, the purpose for its erection, and the authority or weight of the fence as evidence to the record boundary. If the fence is evidence to the record boundary the surveyor may use it to reestablish or support the location of the record boundary. On the other hand, if the fence does not coincide with the record boundary, the surveyor must explain the possible significance of the difference. The responsibility of the surveyor is not to resolve any conflicting title claims but identify and locate any potential conflicting title claims. This information is communicated to the client (or their attorney) in a clear, understandable, and comprehensive manner. The client may, after receiving legal advice, decide to do nothing, maintain the status quo, negotiate and compromise with the neighbor, recognize any adverse claims, arbitrate, or litigate.

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¹See Pencil v. Buchart, 551 A.2d 302, 306-307 (Pa. Super. 1988), Yoho v. Stack, 540 A.2d 307, 310 (Pa. Super. 1988). Also see, e.g., (dissenting opinion) West Virginia Pulp & Paper Co. v. J. Natwick & Co., 123 W.Va. 753, 777 (1941); Caputo v. Mariatti, 113 Pa.Super. 314, 173 A. 770 (1934); Cole v. P. & L. E. R. R. Co., 106 Pa.Super. 436 (1932); Adams v. Tamaqua Underwear Co., Pa., 161 A. 416 (1932); Keech v. Delaware County Trust Co., 297 Pa. 442, 147 A. 96 (1929); Zirkle v. Three Forks Coal Company, 103 W.Va. 614, 622, 138 S.E. 371 (1927); Winding Gulf Colliery Co. v. Campbell, 72 W.Va. 449, 466 (1913); Wilcox v. Snyder, 22 Pa.Super. 450



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(1903); and Kime v. Polen, Pa., 8 A. 783 (1887). Also cf. Roth v. Halberstadt, 258 Pa.Super. 401, 392 A.2d 855, 857 (1978); Allison v. Oligher, 141 Pa.Super. 201, 14 A.2d 560, 571 (1940); United Thacker Coal Co. v. Red Jacket Jr. Coal Co., 146 C.C.A. 241, 232 F. 49, 58 (1916); Thompson v. Hill, 137 Ga. 308, 73 S.E. 640, 643 (1912); Koch v. Gordon, 231 Mo.645, 133 S.W. 609, 610 (1910); Grier v. Pennsylvania Coal Co., 128 Pa. 79, 154 A. 449, 451 (1889).

² See, e.g., Barba Inv. Co. v. Walker, Fla.App., 350 So.2d 509, 512 (1977); Kahn-Reiss v. Detroit & Northern Sav. & Loan, Mich., 228 N.W.2d 816, 824 (fn.6) (1975); Siegel v. Renkiewicz Estate, Mich., 120 N.W.2d 876, 879 (1964); Di Virgilio v. Ettore, 188 Pa.Super. 526, 149 A.2d 153 (1959); Chicago Club of Lake Geneva v. Ryan, 203 Wis. 272, 234 N.W. 488, 491 (1931); and W. P. Thompson v. W. P. Zartman Lumber Company, 55 Pa.Super. 302 (1913)

³See, e.g., Metcalf v. Buck, 36 Pa.Super. 58 (1908)

⁴ See, e.g. W. P. Thompson v. W. P. Zartman Lumber Company, 55 Pa.Super. 302 (1913) and Reilly v. Mountain Coal Co., 204 Pa. 270, 54 A. 29 (1903). Also cf. West Virginia Pulp & Paper Co. v. J. Natwick & Co., 123 W.Va. 753, 765 (1941). See also, Lewis v. Yates, 62 W.Va. 575, 592 (1907) quoting from Owen v. Bartholomew, 9 Pick. 520

⁵Cf. Ralston v. Groff, 55 Pa. 276 (1867)

⁶ Contra. Reiter v. McJunkin, 8 Pa.Super. 164 (1898) and Potts v. Everhart, 26 Pa. 493 (1856)

⁷Cf. Di Virgilio v. Ettore, 188 Pa.Super. 526, 149 A.2d 153 (1959); Kron v. Daugherty, 9 Pa.Super. 163 (1898); Ralston v. Groff, 55 Pa. 276 (1867); Ogden v. Porterfield, 34 Pa. 191 (1859); and McCoy v. Hance, 28 Pa. 149 (1857) ⁸Cole v. P. & L. E. R. R. Co., 106 Pa.Super. 436 (1932)

⁹ Caputo v. Mariatti, 113 Pa.Super. 314, 173 A. 770 (1934); State v. Herold, 76 W.Va. 537, 542 (1915); and Morris v. Dalrymple, 18 Pa.Super. 287 (1901). But c.f. Hatfield v. Workman, 35 W.Va. 578, 585 (1891) quoting from Manufacturing Co. v. Packer, 129 U.S. 688, 9 Sup.Ct.Rep. 385; Ogden v. Porterfield, 34 Pa. 191 (1859); Hagey v. Detweiler, 35 Pa. 409 (1860); Armstrong v. Hall, 15 Pa. 23 (1850); and Sweigart v. Richards, 8 Pa. 436 (1848).

¹⁰ See Huffman v. Mills, 131 W.Va. 219, 223, 46 S.E.2d 787 (1948) quoting Teass v. City of St. Albans, 38 W.Va. 1, 17 S.E. 400 (1893), Clear Fork Coal Company v. Anchor Coal Company, 111 W.Va. 219, 229, 161 S.E. 229 (1931); George v. Collins, 72 W.Va. 25, 28 (1913); and Harman v. Alt, W.Va., 71 S.E. 709, 710 (1911).

¹¹ See George v. Collins, 72 W.Va. 25, 28 (1913) and Harman v. Alt, W.Va., 71 S.E. 709 (1911)

¹² See Harman v. Alt, W.Va., 71 S.E. 709, 710 (1911) but cf. State v. Lillie Mounts, 118 W.Va. 53, 56, 150 S.E. 513 (1929)

¹³Somon v. Murphy Fabrication & Erection Co., 160 W.Va. 84, 90, 232 S.E.2d 524 (1977), quoted from, Bitonti v. Kauffield Co., 94 W.Va. 752, 120 S.E. 908 (1923)

¹⁴Cf. McCoy v. Hance, 28 Pa. 149 (1857)

¹⁵ See, e.g., Yonker v. Grimm, 101 W.Va. 711, 719-720, 133 S.E. 695 (1926) and State v. Herold, 76 W.Va. 537, 542 (1915)

¹⁶ Cf. Reiter v. McJunkin, 8 Pa.Super. 164 (1898)

¹⁷ Quoted from Gillespie A Treatise on Land-Surveying at page 155 (Appleton & Company, New York, NY: 1881).



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