

MISSOURI SURVEYOR

A Quarterly Publication of the
Missouri Society of Professional Surveyors

Jefferson City, Missouri

June 2009



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MISSOURI SURVEYOR

CALENDAR OF EVENTS

2009-2011

July 10-11, 2009

Board of Directors Meeting and
Minimum Standards Workshop
Lodge of Four Seasons
Lake Ozark, MO

October 15-17, 2009

52nd Annual Conference
St. Louis Airport Marriott
St. Louis, MO

December 5, 2009

Board of Directors Meeting
MSPS Office
Jefferson City, MO

May 7-8, 2010

Spring Workshop
Lodge of Four Seasons
Lake Ozark, MO

October 7-9, 2010

53rd Annual Meeting and
Convention
Tan-Tar-A Resort
Osage Beach, MO

May 6-7, 2011

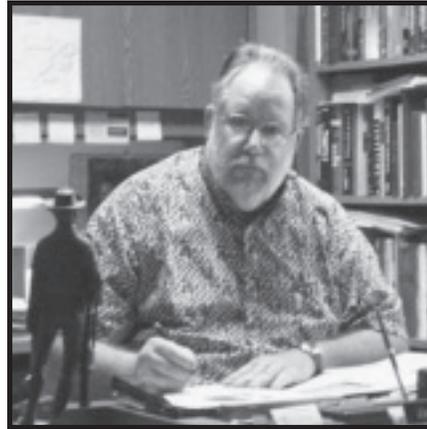
Spring Workshop
Lodge of Four Seasons
Lake Ozark, MO

John Alan Holleck, Editor



Notes from the Editor's Desk

by John Alan Holleck



Another three months has gone by without so much as a by your leave and I sit before you trying to think of something to say. On a personal note, my health does not seem to be deteriorating so things on my home front seem pretty good. In the past three months, the economy has stayed rather stagnate, which may be a good sign. However, the bankruptcy filing by General Motors on the first of June could change our economic landscape for ever. The jury is still out on whether or not the change will be for the good or bad. Well, enough said on such a depressing subject on to the June issue of the *Missouri Surveyor*.

After the usual messages from President Pratte, and myself, please take note of the "Meet me at the Fair" description and map because we have an unusual opportunity to interact with a large number of Missouri State Fair goers. Chris Wickern, local Sedalia surveyor, has taken the lead for this beneficial program. The first significant article of the June issue is by David Ingram entitled, "Three Surveyors and the Other Guy." Of course, the topic is the Presidential sculpture on Mount Rushmore. Ingram discusses the careers of the four Presidents as well as giving us history lesson about surveying. After a humor break and a couple of advertisements, "Boundaries by Acquiescence," by Joel Leininger, a Baltimore lawyer and Associate Editor of "The American Surveyor" follows. Mr. Leininger tries to dispel some of the inherent problems of whether or not property has been transferred by acquiescence. Winding up the front half of our quarterly is a preview of the annual convention to be held in St. Louis in mid-October.

The opening article of the back half of the *Missouri Surveyor*, is "Tapes, Transits, and Total Stationing" by a professor of surveying at Murray State University, Andrew C. Kellie. Professor Kellie reminisces about where we older surveyors came from that our younger brethren are unaware of, let alone understanding why we are in awe of today's equipment. Next is the answer to last quarters "Are You Smarter Than a Missouri S & T sophomore?" submitted by Dr. Richard Elgin. "Right of Entry?" by Robert Dean, a Washington state surveyor, follows, which is a discussion for the need of 'right of entry' legislation. The final article of our June issue is "The Surveyor's Compass," by Richard F. Lunna, a Florida surveyor. The subject works well in tandem with Professor Kellie's article. Hopefully, each of you will find something to interest you. Have a good and prosperous summer. 🇺🇸

Cover: Adam Teale, PLS, of Midland Surveying, sets up a GPS base station to conduct a static observation session. The exercise was conducted west of the Northwest Missouri State University Campus in Maryville, Missouri.

THE MISSOURI SURVEYOR

Published quarterly by the
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The Missouri Surveyor is published quarterly by the Missouri Society of Professional Engineers, to inform land surveyors and related professions, government officials, educational institutions, contractors, suppliers and associated businesses and industries about land surveying affairs. Articles or opinions appearing in this publication do not necessarily reflect the viewpoints of MSPS but are published as a service to its members, the general public and for the betterment of the surveying profession. No responsibility is assumed for errors, misquotes or deletions as to its contents. Articles may be reprinted with due credit given.

President's Message



by Darrell D. Pratte

By most accounts this was an aberrant legislative session. It was not only MSPS, the professional registration board, the Land Survey Program and land surveyors in general that had a tough time passing a bill. Only eight percent of the bills introduced to this congress were passed and sent to the Governor for his signature and inclusion into the Missouri Statutes. Everything from political fratricide to term limited representatives and senators has had a share of the blame for this "do nothing" session. Not everyone agrees that a "do nothing" congress is a bad thing, it just depends if your dog was in the hunt or sleeping by the fire with one eye open.

Last Fall, after the MSPS Annual Meeting, the legislative committee asked the MSPS Board of Directors for direction. The legislative committee had a prioritized list of six items they thought were important to the membership. The Board voted on how to prioritize the list and found they were in agreement with the Committee on the first two items. Open Chapter 59 to increase the Land Survey Fund and revisit the Definition of Land Surveying. At the Board of Directors meeting in February a remarkable piece of legislation fell into our lap. The opportunity for land surveyors to have the lead in writing the standards for the cadastral layer in GIS mapping.

The cadastral layer in GIS mapping belongs to the Professional Land Surveyor. A cadastral layer built without input of a PLS is like digging the foundation of a house with a shovel in the same amount of time it could be completed with a backhoe. A backhoe may be superfluous, but the end product is so much better.

The creation of cadastral layer standards has been on the radar screen of MSPS and other organizations for several years. Tim Haithcoat, Missouri Spatial Data Information Service (MSDIS), Program Director and State Geographic Information Officer (GIO) held several meetings through the Missouri GIS Advisory Committee (MGISAC). The focus of these meetings is to write a set of standards that all GIS users in Missouri will understand. The meetings I have attended came to a fundamental agreement, the PLS should take the lead in writing the standards for the cadastral and geodetic layers of a GIS. Draft standards were submitted to the committee, but that seemed to be the end.

MSPS members and current or former MSPS GIS Committee Co-Chairs; John Teale, Kevin DeSain and Joe Clayton jump-started the process two years ago. A very good and detailed cadastral standard was written, presented to, and accepted by the State GIO and MGISAC. A Senator thought this a good idea, and volunteered to write legislation putting the creation of the cadastral standard with the Land Survey Program.

This moved the Definition of Surveying to a sidelined position. Though still important, it was decided to strike on the GIS legislation while the iron was red hot. The Land Survey Fund increase would remain a priority.

The Land Survey Program is nearly 100% funded by a one-dollar fee, collected by the Recorder of Deeds in every County and the City of St. Louis. Added to each document recorded in the Recorder of Deeds office this one-dollar fee has sustained the Program for forty years. No matter the economy, this dollar has simply run out of steam. Although it does not take a MBA to know if the housing market is down there is not going to be a lot of action at the courthouse.

Cutbacks in the Program have begun. No contracts will be awarded for any type of surveys in fiscal year 2010, which begins July 1, 2009. There are four open slots for fulltime employees. Those slots will not be filled. Should the recession deepen the Program may have to resort to layoffs.

Needless to say neither of these bills will become law latter this summer. I hope these bills will still be at the top of the MSPS legislative concerns. I've learned a lot about making sausage over the winter. I'm prepared to grind the meat and stuff the casing if that is what it takes to have breakfast. I may give you a call for advice on the proper amount and type of spices, or help in getting greasy. 🍖

Meet Me at the Fair

by Chris Wickern, PLS

Educating the Public about what we do and how we do it is one of those rare subjects upon which nearly all Land Surveyors agree. It is a problem. Efforts to educate the public are carried out by all of us, one client at a time. How do we expose the public at large to our Profession? The public is not going to come to us except as individuals, and then only when needed. You know what is said about the Mountain, and it is not coming to us.

The Department of Natural Resources has had an outstanding display at the Missouri State Fair. They have an entire building and grounds area dedicated for their use. In recent years, the department has taken a display consisting of a marker, a sign, a witness tree and posters of surveyors past and present. Last year, the department added a full-color, life-size standee of the State Land Surveyor, suitable for photo opportunities. However, the department was not able to staff the exhibits to answer questions or to draw interest. 250,000 attended the Fair last year. Over 24,000 of our survey illiterate brethren stopped by the building. They viewed displays, and listened to presentations by Department volunteers and staff at the Fair.

This is an excellent opportunity where the mountain *is* coming to us.

The Department has graciously offered to partner with the Society, make room for us, and assist us in an effort to take one step along the road of educating the public. We need you, Professional Surveyors, to be proactive and be available to generate interest and answer questions. Who knows, that kid you talk to at the Fair just might get a spark ignited and be the Surveyor of tomorrow. Current plans are to set a

Commemorative Marker at a highly visible location with as much fanfare as we can muster; Layout a 100 foot course, have groups pace and train them to measure by pace count, conduct a group contest pacing the distance along a different course, award prizes from handouts; Surveying through the ages; demonstrate GLO field procedures, transit & chain, theodolite & steel tape, total station, through today's tools, and a display of Survey Plats through the ages (from a Township & Range Plat, Subdivision of Sections, to a Lot & Block Subdivision). Each group of volunteers will be asked to do what they are comfortable doing, relaxing the Professional and the public making for a cordial and fun event for all. All volunteers must realize this is a Society function. Volunteers will receive a shirt with the Society's logo to wear and keep. This is a function to promote the profession, and not a business.

Ideas are nothing more than a thought if no actions are taken. It will take involvement from you to transform the idea into a successful event mutually benefitting the Society and the public.

We need your help!

We need your personal and professional interest to make this a success. We need your time, your ideas, and your boots on the ground. MSPS won't make this a success. It can only be successful if we as members step up and make it successful. It's time to be proactive, represent our profession, and have some while interacting with the public. Make your commitment and sign up today, or sign up on line at <http://www.missourisurveyor.org>. 

Surveyors Review Course

AUGUST 5-7, 2009

Campus of the Missouri University of Science and Technology (MS&T)
Rolla, MO

Cosponsored by: MS&T and the Missouri Society of Professional Surveyors

Topics: Exam Preparation, Legal Principles, USPLSS, Errors Analysis, Route Surveys, Instrumentation, GPS Surveys, State Plane Coordinates, Problems Session, Practice NCEES-like Exam

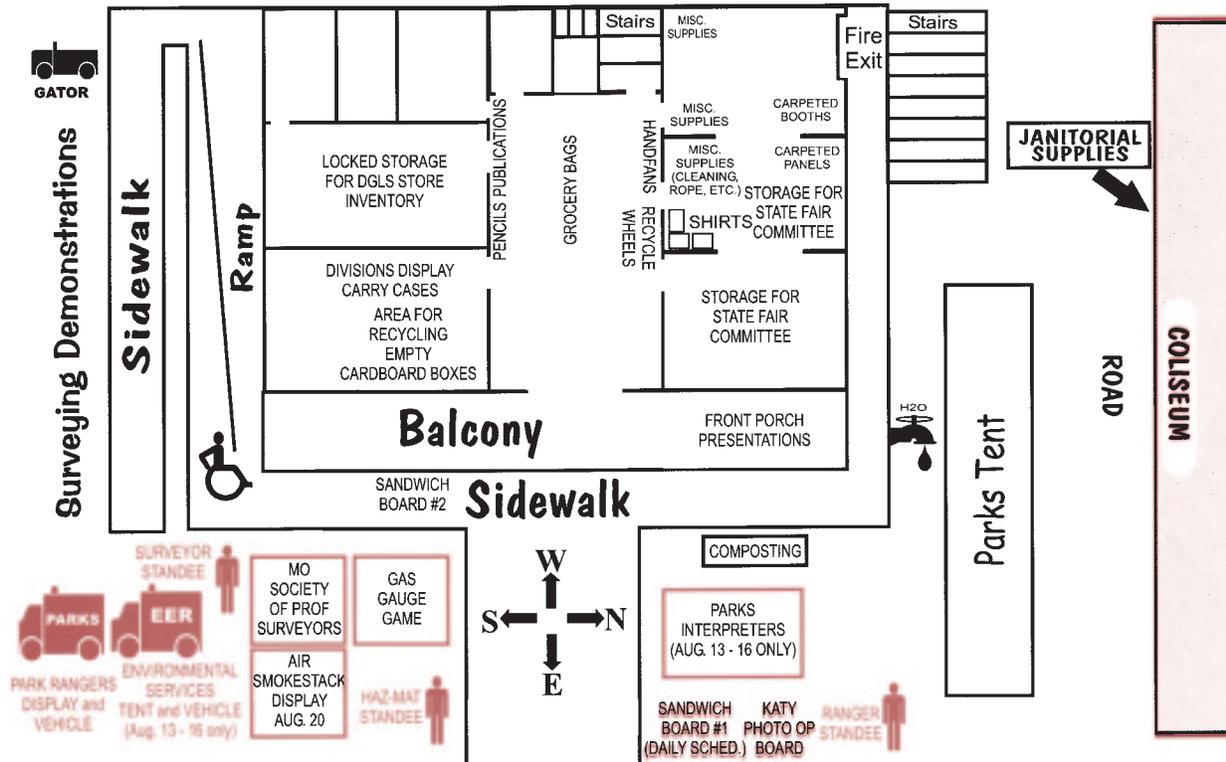
2.2 CEU's, 22 PDU's

Instructors: Dr. Dick Elgin, Dr. Joe Paiva, Norman Brown, Mike Flowers

\$795.00

Contact: Distance and Continuing Education; MS&T; Rolla, MO 65209; 573.341.4442

Meet Me at the Fair



DRAFT LAWN AND SECOND FLOOR STORAGE LAYOUT - Womans Building (Subject to change) 4/17/09

* RED ITEMS ARE BROUGHT INSIDE THE BUILDING EACH NIGHT AND SETUP EACH MORNING.

MSPS VOLUNTEER SCHEDULE MISSOURI STATE FAIR — AUGUST 13 THROUGH 16

THURSDAY, August 13, 2009 – 9:00 a.m. to 5:00 p.m.

Surveying Demos and working the booth by:

Central Missouri Members of the MSPS

FRIDAY, August 14, 2009 – 9:00 a.m. to 5:00 p.m.

Surveying Demos by:

Metro (Kansas City) Chapter of the MSPS

SATURDAY, August 15, 2009 – 9:00 a.m. to 5:00 p.m.

Surveying Demos by:

Southeast Chapter of the MSPS

SUNDAY, August 16, 2009 – 9:00 a.m. to 1:00 p.m.

Surveying Demos by:

1. _____ 2. _____

August 16, 2009 – 1:00 p.m. to 5:00 p.m.

1. _____ 2. _____

THURSDAY, August 20, 2009 – 9:00 a.m. to 5:00 p.m.

Surveying Demos and working the booth by:

Missouri Association of County Surveyors

FRIDAY, August 21, 2009 – 9:00 a.m. to 1:00 p.m.

Surveying Demos by:

1. _____ 2. _____

August 14, 2009 – 1:00 p.m. to 5:00 p.m.

1. _____ 2. _____

SATURDAY, August 22, 2009 – 9:00 a.m. to 1:00 p.m.

Surveying Demos by:

1. _____ 2. _____

August 15, 2009 – 1:00 p.m. to 5:00 p.m.

1. _____ 2. _____

SUNDAY, August 23, 2009 – 9:00 a.m. to 1:00 p.m.

Surveying Demos by:

1. _____ 2. _____

August 16, 2009 – 1:00 p.m. to 5:00 p.m.

1. _____ 2. _____

Please fax this form to 573-635-7823 or email to mmps@missourisurveyor.org.
For questions call, 573-635-9446.

Three Surveyors and the Other Guy

by David Ingram



“There is no glory in age alone, but if the deeds of the past have been distinguished by the industry of our forebears, it is to their honor to praise them — but more honorable to imitate them” — or in the case of surveyors, to follow in their footsteps.

OPENING COMMENTS

What a wonderful location to assemble for a celebration, but as your speaker I can also tell you that this is quite an intimidating location. To have these four presidents looking over my shoulder and I'd like to think listening in on our conversation, causes me to pause and reflect on how we arrived here today as a nation and as a group of surveyors. It also causes me to reflect on my own journey to this podium.

My career as a surveyor was purely accidental and the progression to being a study of surveying history is very ironic. When I was in high school and college my two least favorite subjects were history and foreign languages (including English I might add) — and it is debatable which was at the bottom of the heap. So what do I do, I end up being a surveyor which relies very heavily on history and end up getting very interested in the history of surveying. On the other hand, please don't ever ask me to take Western Civ 101 again. What I do know with certainty is that a surveyor can't know where he is going if he doesn't know where he came from. So how did we arrive here today?

Throughout the history of this country surveyors have played a critical role at every step of the journey over the last 400 years. In the days of being colonies, surveyors most likely were the first “learned professionals” to arrive on the shores of North America and they were indeed instrumental in the settlement and development of this country. They completed surveys in Virginia as early as 1625 so that the settlers could be secure in their homes and property. They established the boundaries between the several colonies. They were called upon by the Privy Council (the equivalent of our Supreme Court) to help settle boundary disputes. Frequently they would be called upon to perform other governmental functions as the representative of the colonial governors. They truly lead the way in the movement of the frontier Westward from the Atlantic shores. When it came time to organize this country, six surveyors (over 10% of the signers) risked everything

they had to sign the Declaration of Independence. And then there were these “Three Surveyors and another guy.”

WHO IS THIS OTHER GUY?

Historian Duane Robinson first conceived the idea of Mount Rushmore in 1923 to promote tourism and in 1924 he convinced Gutzon Borglum to travel here to evaluate the site. In 1925 the Mount Rushmore National Memorial Commission was authorized by Congress and President Coolidge insisted that along with Washington, two Republicans and one Democrat be portrayed. Throughout the history of this country it seems that politics can always get in the way.

It would seem, however, that in spite of politics, good decisions were made in choosing the four presidents that are looking over my shoulder. These presidents were selected by Borglum because of their role in preserving the Republic and expanding its territory. Unfortunately we can't claim that three of them were chosen simply because they were surveyors.

But what about Mr. Roosevelt? Why is he here? After all, there is no record of him ever having done any surveying. Perhaps it is because he did have a deep respect for surveyors, especially for the three next to him on the mountain. From “The Works of Theodore Roosevelt” where he is writing about Daniel Boone, he penned the words “The hunters were the pioneers; but close behind them came another set of explorers quite as hardy and resolute. These were the surveyors. The men of chain and compass played a part in the exploration of the West (and I might add the entire country) scarcely inferior to the heroes of axe and rifle. Often, indeed, the parts were combined; Boone himself was a surveyor. Vast tracts of Western land were continually being allotted either to actual settlers or as bounties to soldiers who had served against the French and Indians. These had to be explored and mapped and as there was much risk as well as reward in the task, it naturally proved attractive to all adventurous young men who had some education, a good deal of ambition, and not too much fortune. A great number of young men of good families, like Washington and Clark, went into the business.”

In the course of preparing this presentation I have become intrigued with Mr. Roosevelt and have gained some admiration for him that I did not previously have. Probably most of you were like me when it came to Mr. Roosevelt — you had heard of the Rough Riders and knew he was a president, but not much else. It turns out he was much more than that both before and after he was President. Putting aside his political activities, he was a historian, conservationist, naturalist, explorer, hunter, author, and soldier. He was president during a period of time when technology was making rapid growth by leaps and bounds. He was truly what I would consider to be a Renaissance Man. While I would not label him an environ-

Three Surveyors and the Other Guy (continued)

mentalist, he was clearly a forward thinking conservationist when he wrote “We must handle the water, the wood, the grasses, so that we will hand them on to our children in better and not worse shape than we got them”.

SURVEYING WAS THE FOUNDATION FOR LIFE

For the other three gentlemen looking over my shoulders, surveying can, and should be, considered the foundation for their lives. It is my opinion that without the influence of surveying in their background, none of the three — Washington, Jefferson, and Lincoln — would have been anything more than small foot notes in history, if even that much.

The first of our surveyors to examine is **Washington**



At the age of 26, George Washington decided to try for a second time to win a seat in the House of Burgesses — the Colonial government of Virginia. He had lost an earlier election because of a crucial error in his campaign; he had not “treated” the voters properly — which is to say, he had not provided them with sufficient alcoholic refreshment. In order to correct his ways he purchased 144 gallons of wine, rum, hard cider, punch, and beer for distribution to his supporters. He won the election having received more than 2 votes per gallon and this launched a rather successful political career. And just think, today we’re worried about miles per gallon.

But how did Mr. Washington get to this point in his career? George Washington was born in 1732, the third son of Augustine Washington and the first son of Augustine’s second wife, Mary Ball. As the third son George did not enjoy some of the privileges that his two older half brothers received. The two older brothers, Lawrence and Austin, had, for instance, been sent to England to study. Lawrence had attended Appleby’s School where he had studied for 7 years including such subjects as military drill and surveying. When at age 11 his father died, George went with this mother and younger siblings to one of the lesser family farms, Ferry Farm, near Fredericksburg which was to be his inheritance. There he completed some studies, probably at Rev. James Marye’s school, but he realized at a young age that he was going to need to learn a trade to earn a living and improve his place in life and the community. He decided surveying offered some possibilities.

As James Flexnor pointed out concerning surveyors in colonial America: “The surveyor was sworn as a government official because, in those unfrequented areas, it was up to him to see that no fraud was done by making surveys larger or smaller than was stated in the deeds, or by laying out land in manners forbidden by the various restrictive laws. On the other side, he served as his employer’s agent. When work-

ing on a tract already patented, he was an agricultural planner commissioned to divide a large area in a manner that would earn the most money from rent or sale. Or if he was hired to find land on which to lay out a patent, his role was that of an explorer; he needed to identify and map that acreage which would prove, after the forest had vanished and the roads been built and trade begun, the most valuable. Often his duties as a official and the interest of his clients were in conflict that it took statesmanship to resolve.”

Against this background, young George commenced his studies to become a surveyor during his early teens. Exactly who his teacher was we do not know, but a very good case can be made that it was his older half-brother Lawrence who had studied surveying in a formal setting in England. George had a circumferentor (plain compass) and chain that he had inherited from his father. What he studied we know quite well because his school boy copy book survives to this day and it shows a progression through the various math and surveying lessons that one would expect of the period. Where he studied is not known with certainty, but all evidence suggests he left his mother and younger siblings at Ferry Farm and he went back to the Birth Place farm to study with Lawrence. And, in addition to his class room studies, his note book indicates that he commenced some practice surveys there. An analysis of these surveys shows that even at the age of 15 he was running accurate surveys that he then plotted and drafted quite accurately. As a Boy Scout merit badge counselor who has worked with a lot of teen aged boys I can tell you that I am especially impressed with his early practice work. I’d give him a merit badge.

A significant advantage that young George had was that even though he was the third son of a deceased father, he was able to mingle in the proper society circles and this led to his first job as a surveyor. At the ripe old age of 16 he was invited to join the son of Lord Fairfax, George William Fairfax, on a surveying expedition to the Western lands and was fortunate that a very skilled surveyor James Genn, the Surveyor of Prince William County, also went along who could act as his mentor. This trip afforded young George an excellent opportunity for training and opened the doors to a relationship with the Fairfax family and access to Virginia society that would last the rest of his life.

In his journal that he kept during this journey, and the remainder of his life, we see that he experienced many of the wonders of the frontier and was introduced to many people that would help to establish him for the many important positions that were to come later in life.

One journal entry I find particularly interesting was on Wednesday, March 23, where he wrote “Rain’d till about two o’clock & Clear’d when we were agreeably surpris’d at y. sight of thirty odd Indians coming from War with only one Scalp.

(continued on page 10)

MO Colleges/Universities Where Land Surveying Coursework is Available

The following list will be updated quarterly as new information becomes available.

Longview Community College - Lee's Summit, Missouri

Contact: David Gann, PLS, Program Coordinator/Instructor -
Land Surveying MCC - Longview, MEP Division
Longview Community College
Science and Technology Bldg.
500 SW Longview Road
Lee's Summit, Missouri 64081-2105
816-672-2336; Fax 816-672-2034; Cell 816-803-9179

Florissant Community College - St. Louis, Missouri

Contact: Ashok Agrawal
Florissant Community College
3400 Pershall Road
St. Louis, Missouri 63135
314-595-4535

Missouri State University - Springfield, Missouri

Contact: Thomas G. Plymate
Southwest Missouri State University
901 So. National
Springfield, Missouri 65804-0089
417-836-5800

Mineral Area College - Flat River, Missouri

Contact: Jim Hrouda
Mineral Area College
P.O. Box 1000
Park Hills, Missouri 63601
573-431-4593, ext. 309

Missouri Western State University - St. Joseph, Missouri

Contact: Department of Engineering Technology
Missouri Western State University
Wilson Hall 193
4525 Downs Drive
St. Joseph, MO 64507
816-271-5820
www.missouriwestern.edu/EngTech/

St. Louis Community College at Florissant Valley

Contact: Norman R. Brown
St. Louis Community College at Florissant Valley
3400 Pershall Road
St. Louis, Missouri 63135-1499
314-595-4306

Three Rivers Community College - Poplar Bluff, Missouri

Contact: Larry Kimbrow, Associate Dean
Ron Rains, Faculty
Three Rivers Community College
2080 Three Rivers Blvd.
Poplar Bluff, Missouri 63901
573-840-9689 or -9683
877-TRY-TRCC (toll free)

Missouri University of Science and Technology - Rolla, Missouri

Contact: Dr. Richard L. Elgin, PLS, PE
Adjunct Professor
Department of Civil Engineering
1401 North Pine Street
211 Butler-Carlton Hall
Rolla, Missouri 65409-0030
573-364-6362
elgin@mst.edu

University of Missouri-Columbia, Missouri

Contact: Lois Tolson
University of Missouri-Columbia
W1025 Engineering Bldg. East
Columbia, Missouri 65211
573-882-4377

Missouri Southern State College - Joplin, Missouri

Contact: Dr. Tia Strait
School of Technology
3950 E. Newman Rd.
Joplin, MO 64801-1595
1-800-606-MSSC or 1-417-782-MSSC

If You Ever Wondered Why . . . Ask Mike!

by Michael Whitling, PSM



Quick Facts:

- Voter turnout in the U.S. is 48.3%, ranking 114th in the world. The top five are Italy, 92.5%; Cambodia, 90.5%; Seychelles, 90.2%; Iceland, 89.5%; Indonesia, 88.3%. The bottom five are Jordan, 29.9%; Guatemala, 29.8%; Djibouti, 28%; Egypt, 24.6% and 140th and last is Mali, 21.7%.
- Some sharks swim in a figure eight when frightened.
- Twenty percent of China's plants are used in medicine.
- Over 53 countries grow coffee worldwide, but all of them lie along the equator between the tropic of Cancer and Capricorn.
- The state of Michigan claims more varieties of trees than all of Europe.
- One out of 17 school children may suffer from a food allergy that could affect their nutrition and school performance. The foods children are most allergic to, in descending order of prevalence, are milk, peanuts, egg, tree nuts, soy, wheat, celery, mango, and garlic.
- It takes about three hours for food to be broken down in the human stomach.

- The only married couple to fly together in space was Jan Davis and Mark Lee.
- Twenty-three centuries passed between the discovery that iron was subject to magnetic attraction and that another metal, nickel — discovered in 1751 — was also attracted by a magnet, though much less strongly.
- Any month that starts on a Sunday will have a Friday the 13th in it.
- A ball of glass will bounce higher than a ball of rubber.
- More than half of American baby boomers — 55 percent — say they express themselves through their work. That compares with 46 percent for members of Generation X — those born from 1965 through 1976 — and only 34 percent of people older than 50.
- The average human eye can distinguish about 500 different shades of gray.
- The ancient Chinese believed that swinging your arms could cure a headache.

Send your thoughts to mjw@miamidade.gov. 

Reprinted from "The Florida Surveyor", Nov. 2008

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and
SCHMITZ** EST. 1910
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Three Surveyors and the Other Guy (continued)

We had some liquor with us of which we gave them Part it elevating there Spirits put them in y. Humour of Dancing is as follows Viz They clear a large Circle and make a Great Fire in y. middle then seats themselves around it y. Speaker makes a grand speech telling them in what manner they are to Daunce after he is finish'd y. best Dauncer Jumps up as one awaked out of Sleep & Runs & Jumps about y. ring in a most Comocle manner he is followed by y. rest then there begins there Musicians to Play y. Musick is a Pot half of Water with a Deerskin Stretched over it as tight as it can & a goard with some Shott in it to Rattle & a Piece of an horses Tail tied to it to make it look fine y. one keeps Rattling and y. other Drumming all y. while y. others is Dauncing." Quite an experience for a 16 year old on his first surveying trip. How many of us would still be surveyors if that had happened to us — having an Indian war party walk into camp? For that matter, how many of us would be surveyors today if we had to camp for weeks and months on end?

Young Mr. Washington's next stop in his professional career was to be appointed the County Surveyor of Culpeper County, Virginia, at the age of 17. He set out to start doing surveys on his own and the amount of land he could cover is down right amazing. His journal / notebook records the surveys he completed and day in and day out it has entries like the following: April 14th, 1750 surveyed 400 acres for Josiah Arnold and 400 acres for James Smith; April 16th, 1750 surveyed 400 acres for John Stackhouse, 330 acres for James Warden, and 244 acres for Francis McBride; April 18th, 1750, he only did one survey — 425 acres for David Dunbar; April 19th, 1750, 380 acres for William Miller and 375 acres for James Thomas. And the journal goes on and on. Now I don't know about y'all, but in the wild territory he was working, what was then the Western frontier, I'd have a hard time just walking around these parcels in a day, never mind surveying them as I went. And I know this because the areas where he was surveying are areas that I have actually surveyed and I can assure you it is still rough and rugged territory.

While Mr. Washington would continue to perform surveys for the remainder of his life — in fact his last surveying work was just 5 weeks before he died, other matters would start to occupy his time. When his brother Lawrence died in 1752 he not only inherited an estate, but he assumed some of his duties in the community including that of "adjutant" of the colony and soon received a permanent appointment. At the age of 20, he now had the military rank of Major. His work as a surveyor would serve him well in the next few years when he served in the military during the French & Indian Wars (or Seven Years War) and rose first to the rank of Lieutenant Colonel and then to the rank of Colonel. He traveled throughout the region establishing a series of frontier forts through the areas where he had surveyed which had given him a first hand familiarity with the land. His final promotion to Brigadier General occurred in 1758 — all before he had reached

the age of 27. For many men this would have been a lifetime of achievements — for Washington life was only beginning.

Throughout his entire life, the skills that Washington learned as a surveyor would serve him well. Knowledge of the country, the ability to read and make maps, a perspective on the magnitude of the country, self reliance, negotiating skills with people of all social strata, and responding to other challenges allowed him to lead men and country through some very turbulent times. In addition, he made good money in surveying and also was able to increase his land holdings by making judicious acquisitions in the areas within which he had first hand knowledge.

In concluding my comments about Washington, I'd like to share a thought about Washington penned by Mr. Roosevelt. He wrote "It is impossible to estimate too highly the devoted patriotism and statesmanship of the founders of our national life; and however high we rank Washington, I am confident that we err, if anything, in not ranking him high enough, for on the whole the world has never seen a man deserving to be placed above him".



Our second surveyor is **Jefferson**

Mr. Jefferson was exposed to surveying from his earliest memories as his father, Peter, was a very prominent surveyor in colonial Virginia. One survey in particular shows just what kind of man Peter was and the strengths that he and other surveyors brought to this country. In 1746, when young Thomas was just three years old, Peter left home for several months to participate in a very important survey that would shape the history of western Virginia to this very day. In 1649 a grant from the King of England granted all the land between the Rappahanock and Potomoc Rivers to 7 loyal friends. Eventually Lord Fairfax acquired sole title to this paltry 5 million acres of land, but didn't know the extent of his holdings. After the privy Council made a ruling defining the limits of the grant, a survey expedition was sent forth to survey the line connecting the head springs of the two rivers. 76 miles and at least 12 mountain ridges separated the springs, but Peter Jefferson, 3 other surveyors, gentlemen commissioners, and other support personnel went out in September of 1746 to survey this line. In 2 months time they ran a total of over 160 miles of line to accomplish their task and to this day part of their line is the Northern boundary of the county I live in. You know, I have studied this survey, and other surveys in great detail and I have nothing but admiration for the surveyors that preceded us. I'd like to think in today's world that being a surveyor I'm pretty much a man's man. After all I'll take off to the mountains or anywhere else to survey anytime of year and think nothing of it. But let me tell you, when I compare myself to the surveyors of yesteryear, I'm a wuss.

It is against this background and heritage that Thomas

Three Surveyors and the Other Guy (continued)

Jefferson grew up in Virginia. Jefferson's education was at various local schools as he was growing up and culminated with studies at the College of William & Mary. After graduation he was admitted to the bar to practice law in 1767. He also studied in several other areas and throughout his life he studied and was intrigued with the sciences and exploration. Included in his areas of interest was surveying.

In 1773 he apparently became discouraged with the practice of law and flirted briefly with the notion of practicing surveying for a career. On October 14, 1773, he was appointed County Surveyor of Albemarle County (Charlottesville) by the College of William & Mary. As another little side note of history, the College had been given the right many years previously to appoint County Surveyors through Virginia, but they never actually taught surveying as a subject unto itself. The purpose behind the appointments was to raise money for the College as the County Surveyors had to return 1/6 of their receipts to the College. During the time that Jefferson was the County Surveyor there is no record that he actually completed any surveys and the next County Surveyor was appointed a few months later in April, 1774. Probably the reason he did not complete any surveys was because there was little or no vacant land left in Albemarle County to survey and since surveying vacant land for grants was the primary duty of the County Surveyor there was little to do.

However, his interest in surveying went with him throughout the rest of his life in many respects as we shall see. After several years of other duties involving trivial matters such as serving in the Virginia House of Burgesses, the Continental Congress, writing the Declaration of Independence, and the Revolution, he still had many other adventures throughout the rest of his life. And his knowledge of Surveying and other sciences continued to serve him well. He also always kept accurate and modern surveying instruments and other scientific apparatus for the rest of his life.

Jefferson's most enduring effort related to surveying certainly has to be his work on the Land Ordinance of 1785. The foresight that went into this model for the development of our country is difficult to grasp. (First of all, unlike those of us surveyors in the colonial states that had to be able to measure any angle and any distance, he simplified life for surveyors as all you have to do out here is measure a mile and turn 90°.) The ideas of secure title, survey before settlement, orderly development, and many other benefits, certainly had a positive impact on the growth of our country that cannot be seen to such a degree anywhere else in the world. In fact, the rectangular survey system is one of only two things astronauts say they are able to distinguish from space that is man made.

Jefferson's most important effort related to surveying may be the organization of the Lewis & Clark expedition.

As the country was entering into an unparalleled growth spurt his foresight in organizing and sending out the Lewis &

Clark expedition had a major impact on the expansion Westward.

Not only was the idea his, but he took a very active part in planning the expedition, conferring with Lewis on numerous details of the journey, and securing the authority from Congress to send forth the expedition. His scientific curiosity and expertise played a major role in deciding what the goals of the journey should be, what scientific operations they should undertake, and what scientific equipment would be needed. On the more practical side his instructions detailing how to proceed, records that should be kept and published, and organization of the party proved to be very insightful.

Jefferson's scientific interests related to surveying culminated with the creation of the Coast Survey in 1807. According to Harpers New Monthly Magazine in 1879 they stated that "In human progress with the present century there has been no greater marvel than the operations of the Coast Survey". When Jefferson recommended the creation of the Coast Survey, it was only reluctantly that congress agreed and appropriated the sum of \$50,000 to get it started. As it turns out it was a very wise recommendation by Jefferson because soon there were to be accurate navigation charts, the Coast Survey became a defacto Bureau of Standards, geodetic work started pushing across the country, gravity experiments and observations commenced, and numerous other scientific work progressed that lead Harpers to make the grand statement previously mentioned. Indeed the foresight of Jefferson in creating this department truly bettered the health, safety, and welfare of the country and its citizens in many ways — most of which we as surveyors never even think of today.

On more personal levels, his interest and activities in surveying continued throughout the rest of his life. When he founded the University of Virginia he personally took his theodolite, chain, & other equipment and laid out the central grounds for the University of Virginia. If you look at his field notes you can not only see how he completed the survey, but you can see the layout of "the lawn" as it is today. He considered the establishment of the University one of the three most important things he completed during his life. The other two important achievements were the authorship of the Declaration of Independence and the authorship of the Virginia Statute for Religious Freedom.

Other surveying efforts included overseeing the establishment of a United States Prime Meridian, personal field work to determine the heights of the Peaks of Otter in Virginia, surveying the boundary for the new county of Fluvanna County, and surveying his personal lands at Monticello and



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Three Surveyors and the Other Guy (continued)

Poplar Forest and nearby neighbors. And the list of accomplishments related to surveying could go on and on. In all of his surveying problems he would take time to study the problem at hand, research the best methods and equipment to use, and then proceed with his work in a very methodical and scientific manner. Jefferson was indeed one of the great thinkers of his time.

The early days of our country did indeed require great thinkers and men of vision and certainly we are fortunate today to have had Washington and Jefferson as two of our early leaders. Mr. Roosevelt had many things to say about Jefferson, many not so kind and highly critical. However, he did say “Jefferson as fond of science, and in appreciation of the desirability of non-remunerative scientific observation and investigation he stood honorably distinguished among the public men of the day. To him justly belongs the credit of originating this first exploring expedition ever undertaken by the united States Government.

And the third of our surveyors is **Lincoln**



While the effect of surveying on the lives of Washington and Jefferson was significant, the effect of surveying on the life of Lincoln was even more important. In fact, it is my opinion that surveying was the foundation that shaped the entire life of Lincoln and lead him to become the towering figure of history that we know today. Surveying lead to law which lead to state politics which lead to national politics. Without surveying Lincoln would have probably lived out his life as a meager shop keeper in an obscure town in Illinois. Fortunately for the country fate intervened.

Lincoln arrived in Salem (now New Salem), IL, in the spring of 1831 and tried several jobs to earn a living and sustain himself — a tavern keeper, a rail splitter, grocery store keeper, and a postmaster. However, none of these jobs paid very well. He also started to be involved in politics and unsuccessfully ran for a spot in the Illinois legislature in 1832.

This time period was an era during which Illinois was growing exponentially. After becoming the twenty-first state in 1818, speculators from the East were buying large tracts of land and laying out new towns, settlers were arriving in ever increasing numbers, and business was booming. New towns meant new roads. Thousands of farm sites were being established. And John Calhoun, the county surveyor, had more work than he could possibly handle.

It was in this environment that John Calhoun, having heard many good things about Abraham Lincoln, contacted him inquiring if Lincoln would consider becoming the Deputy Sangamon County Surveyor. Thus in the fall of 1832, Lincoln jumped at this opportunity and went to Springfield to meet Mr. Calhoun. After all, the job as Deputy Surveyor paid

\$3 per day — and at the time the salary for the Governor was \$1,000 per year, also about \$3 per day.

Despite having no knowledge of or training as a surveyor, Lincoln and Calhoun agreed to Lincoln becoming a deputy Surveyor. But there were conditions. Lincoln would only accept the position if it carried no political obligations and Calhoun would not place any restrictions on Lincoln expressing his political opinions. Apparently Lincoln had some strong opinions early on. As to the fact that Lincoln did not know anything about surveying, Calhoun agreed to lend him a couple of books to study. While home study and apprenticeship was a common form of education, Lincoln went at it with more fervor than most.

Back in Salem, Lincoln spent 6 weeks studying two books on surveying, Flint and Gibson, and with the help of Mentor Graham, the school master at Salem, mastered the subject matter and proclaimed himself ready to survey. He also acquired the necessary equipment and supplies including a second hand compass with Jacob's staff, a chain, and a horse — all bought on credit — and accepted his first job of surveying lots in Salem. It was October, 1833.

In some respects this reminds me of my first real job in surveying. Back in 1970 at the ripe old age of 20 I had just dropped out of college after my junior year, got married, and took a job with a rapidly expanding surveying company. When I went in to apply for a job, I told the secretary I had some experience surveying (a summer job and a part time job) and wanted to apply. The boss growled out from his office, “You're hired, what's your name”. My first day on the job I showed up with my boots on expecting to get assigned to a field crew, but since I had some computer training in college (and a math major to boot) I was told to go upstairs and have Bob (who's Bob — darned if I knew) start training me on their computer. Three months later my title was “chief of parties”. We were all young and naive and thought we could do anything — and we did. Boy oh boy, surveying is not like that anymore.

Well, back on point, back to Mr. Lincoln. For the next two and one-half years he practiced surveying as his primary occupation during which he completed the surveys of several towns, the roads in the area, and boundary surveys in Sangamon County. His first major survey was started in late 1833 and concluded with a plat drawn for Reason Shipley that was dated January 6, 1834. Mr. Shipley had arrived in the area about 1826 and over the next few years had acquired a total of 12 entries that amounted to approximately 2 sections of land. Mr. Lincoln resurveyed these parcels for the purpose of reestablishing corners and marking property lines. In addition, he surveyed several additional parcels of land for Shipley for which title was acquired in the next few months. An interesting tidbit of history related to this survey occurred

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Three Surveyors and the Other Guy (continued)

several years later and once again shows that things never really change when it comes to surveys and surveyors. A granddaughter of Shipley was getting on in years and she and her husband were preparing to move to a smaller home. She had cleaned out and was throwing away several bundles of papers that had accumulated in the family for many years — literally tossing them out the attic window. The husband was walking by when one of the bundles fell with a thud right next to him. Upon examination of the bundle he found the plat Mr. Lincoln had prepared for Shipley and, thankfully, saved it.

During his lifetime, Mr. Lincoln became known for many things, but the ones we have all heard about from our earliest days in school involve honesty, integrity, and compassion. This reputation carried on through his career as a surveyor as exemplified by an incident in Petersburg. The story goes that when Lincoln as laying out lots in Petersburg he observed that if he kept going on the line he was running the line would cut through Jemima Elmore's house, the widow of a soldier who had been killed in the Black Hawk wars. Concluding that no real harm would occur if he bent the line, he did so and preserved the house. However, this act of kindness did not make it onto his plat and caused considerable consternation some 25 years later when attempts were being made to resurvey the town. The surveyors consulted Lincoln's original plat to no avail. They went to Springfield to consult a distinguished surveyor — no help there either. And eventually the problem was severe enough that it ended up in court. At that point an Irishman named McGuire turned up and announced that he could explain. He claimed to have helped Mr. Lincoln carry the chain during the survey of Petersburg and explained what Lincoln had done.

Another incident emerging from his participation in the Black Hawk wars also is worth mentioning here showing how friendships and loyalty worked both ways for Mr. Lincoln. During the wars Lincoln had been elected a captain and one of his sergeants was John Short. In 1835 Lincoln was continuing to have financial difficulties. Being a surveyor did not improve his business skills (again, nothing new for today's surveyors) and old debts from his time running a store and from the purchase of surveying equipment were a strain to service and eventually one of the note holders became tired of Lincoln being behind in his payments and had the sheriff confiscate his surveying equipment to be sold to satisfy the debt. At the auction John Short bought the equipment and promptly returned it to Lincoln out of respect and friendship. Years later when John Short was falling on hard times, Presi-

dent Lincoln learned of his plight and appointed him a territorial Indian agent.

While working as a surveyor, other things were also happening with Mr. Lincoln. For a second time in 1834 he ran for the legislature and this time was successful. This was truly the beginning of his political career, but the successful election can be attributed to a large part on his work as a surveyor which caused him to travel throughout the district and get to know people in addition to gaining a reputation as a fair and honest man. Also, as a surveyor, he had to become familiar with the law in the same manner as he learned surveying — by reading the law. Reading the law was a common practice at that time as a way to become a lawyer and after a successful examination he was admitted to the bar in Springfield in the year 1837. Having been elected to the leg-

islature and admitted to the bar, both of which can be traced back to his work as a surveyor, his career prospered.

Mr. Lincoln's reputation as a surveyor lasted long after he ceased his regular duties as a surveyor. In 1859, almost 25 years after Lincoln's last survey, a group of surveyors "met in convention" to discuss mat-

ters of concern, specifically "was the Act of Congress of February 11, 1805, intended to apply and control all future surveys and subdivisions of the government lands?" After a long discussion, it was decided to submit the question to some able lawyer. Mr. Lincoln was chosen because of his being a practical surveyor and leading member of the bar, on the principle that a good lawyer could better interpret and apply the law to a subject to which he is thoroughly conversant. Mr. Lincoln offered the following written opinion: "The 11th Section of the Act of Congress approved February 11, 1805, prescribing rules for the subdivision of sections of land within the United States system of surveys, standing unrepealed, in my opinion, is binding on the purchasers of different parts of the same section, and furnishes the true rule for surveyors in establishing lines between them. The law, being in force at the time each became a purchaser, becomes a condition of the purchase. And by that law, I think the rule for dividing into quarters any interior section, or section which is not fractional, is to run straight lines through the section from the opposite quarter section corners, fixing the point where such straight lines cross, as the middle, or center of section. Nearly, perhaps quite, all original surveys are to some extent erroneous, and in some of the sections quite so. In each of the latter, it is obvious that a more equitable mode of division

No matter what your politics or opinions of individual presidents are, it is safe to say that the presidents of this country have indeed been giants among men.

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Funny Words

The Washington Post's Mensa Invitational

The Washington Post's Mensa Invitational once again asked readers to take any word from the dictionary, alter it by adding, subtracting, or changing one letter, and supply a new definition.

Here are this year's winners. Read them carefully. Each is an artificial word with only one letter altered to form a real word.

1. **Intoxicacion:** Euphoria at getting a tax refund, which lasts until you realize it was your money to start with.
2. **Reintarnation:** Coming back to life as a hillbilly.
3. **Bozone(n):** The substance surrounding stupid people that stops bright ideas from penetrating. The bozone layer, unfortunately, shows little sign of breaking down in the near future.
4. **Cashtration(n):** The act of buying a house, which renders the subject financially impotent for an indefinite period.
5. **Giraffiti:** Vandalism spray-painted very, very high.
6. **Sarchasm:** The gulf between the author of sarcastic wit and the person who doesn't get it.
7. **Inoculate:** To take coffee intravenously when you are running late.
8. **Hipatitis:** Terminal coolness.
9. **Osteopornosis:** A degenerate disease. (This one got extra credit.)
10. **Karmageddon:** It's like, when everybody is sending off all these really bad vibes, right? And then, like, the Earth explodes and it's, like, a serious bummer.
11. **Decafalon(n):** The gruelling event of getting through the day consuming only things that are good for you.
12. **Glibido:** All talk and no action.
13. **Dopeler effect:** The tendency of stupid ideas to seem smarter when they come at you rapidly.
14. **Arachnoleptic fit(n):** The frantic dance performed just after you've accidentally walked through a spider web.
15. **Beelzebug(n):** Satan in the form of a mosquito, that gets into your bedroom at three in the morning and cannot be cast out.
16. **Caterpallor(n.):** The color you turn after finding half a worm in the fruit you're eating.

And the #1 pick:

17. **Ignoranus:** A person who's both stupid and an ass.

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Three Surveyors and the Other Guy (continued)

than the above might be adopted; but a error is infinitely various, perhaps no better single rule can be prescribed. At all events, I think the above has been prescribed by the competent authority.

This may well have been Mr. Lincoln's last interaction with surveying, but his legacy lives on to this day. Surveyors that have had a chance to retrace his work have concluded that he generally did good and accurate work. And his legal work helped to resolve many boundary disputes and his opinions mattered to surveyors.

Mr. Roosevelt had high words of praise for Lincoln and there is a very real possibility that without Lincoln having been a surveyor these words could not have been written. He said "Without Lincoln we might perhaps have failed to keep political unity we had won; and even if, as is possible, we had kept it, both the struggle by which it was kept and the results of this struggle would have been so different that the effect upon our national history could not have failed to be profound".

Closing comments

No matter what your politics or opinions of individual presidents are, it is safe to say that the presidents of this country have indeed been giants among men. And if surveying is the criteria that helps make these giants, then there should be others carved on the mountain above us.

At least two other Presidents had some surveying experience. Herbert Hoover was a geologist and mining engineer professionally and in the course of his education spent three summers performing surveying activities. The first of the three was spent as an assistant on the Geological Survey of Arkansas mapping the Ozarks. The next two summers were spent with the United States Geological Survey in California and Nevada. After his graduation his first effort at job hunting was seeking a job as a surveyor, but he did not succeed in his search and ended up pushing gold ore carts 70 hours per week.

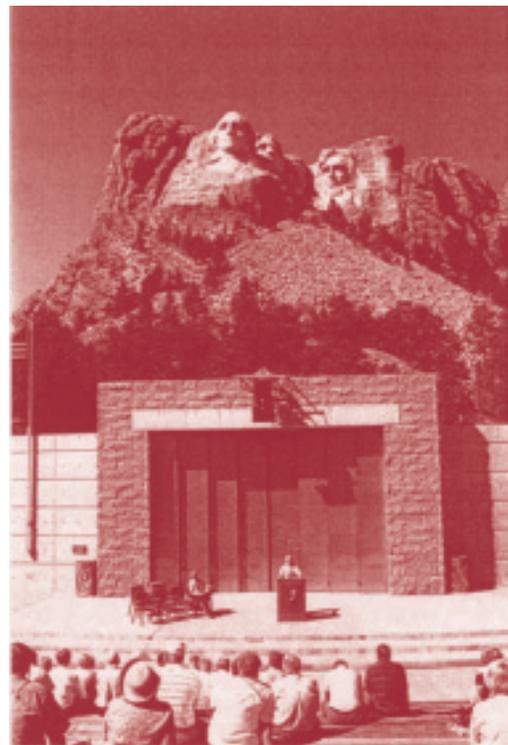
The other presidential surveyor is Ronald Reagan. In his autobiography he recalled that after his freshman year at Eureka College in 1929 he was nearly broke. He had a high school chum who worked as a rodman for a local surveyor. When the surveyor heard he was interested in a job he was not only given the job but the surveyor offered him a scholarship for the following year.

I have commented many times over the years that my personal hope for a legacy is that 100 years from now when a surveyor finds one of my plats in the courthouse the first word out of his mouth isn't a curse word. Being from Virginia I have literally had the opportunity to follow in the footsteps of two of our great surveyors. As I stated at the outset, the greatest honor we can bestow on our forebears is to imitate them. I would encourage everyone gathered here to follow in the footsteps of our honorable forebears and plant your own

footsteps for surveyors to take pride in following 200 years from now. I certainly couldn't have predicted where we are today when I started surveying 38 years ago, but I do know that people will always want to know where their property is and we have a solemn charge to help them feel secure in their homes.

Congratulations to SDSPLS

Finally, let me offer my congratulations to the SDSPLS upon their 25th Anniversary. I had forgotten that when I became active in the NSPS in the early 1980's that now all states had a professional society. I tend to take organizations like this for granted — probably most of us do. But when we take things too much for granted we can lose things before our very eyes. I would encourage all surveyors from South Dakota — for that matter surveyors from all over the country — to examine your own commitment to your profession and do whatever is needed to make it better. We all tend to assume that organizations are forever, but that is a bad assumption to make. So enjoy the celebration of the past, but use this opportunity to renew yourselves for the future. 🇺🇸



David Ingram is a licensed surveyor in the states of West Virginia, Virginia and Maryland. He has been a three term Secretary/Treasurer for the National Society for Professional Surveyors, a two term member of the Board of Directors of the American Congress on Surveying and Mapping, member of the Board of Directors of the Surveyors Historical Society and President of the Board of Trustees of the Museum of Surveying.



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Boundaries by Acquiescence

by Joel Leininger

We retracement surveyors, for the most part, labor within a stable and consistent part of the law. By this, I mean that from place to place, and over time, there is little variation in the doctrines defining correct practice. Monuments, everywhere, trump courses and distances, in the event of a conflict. Natural monuments, everywhere, trump artificial monuments. Sure the Public Land System approach deviates from that in colonial areas, but despite the impact on the landscape, the actual doctrinal deviation between the two systems is surprisingly small. There are many knobs and wrinkles across the country, but, for the most part, retracement is retracement.

That is, until we broach the subject of boundary establishment by acquiescence. A couple of issues ago, we addressed the dilemma of pincushion corners, and the theories driving our treatment of them. From a couple of different quarters came whiners assuming that because I did not mention acquiescence, I was either ignorant of the doctrine, or remiss in overlooking it. Neither is true. But of all the rules governing property lines, this one is the most dangerous for surveyors; it requires a deeper understanding of the intentions and actions of the parties than any other boundary element. It does not lend itself to independent verification. And, the rules concerning it are a complex jumble of conflicting standards across the country.

The Basics

At its most elementary, boundary by acquiescence is the laying-out (or adoption) of a boundary in a particular location by one person, and its being allowed to remain there

undisturbed by the affected neighbor. It is grounded in the desire for stability in the parcel fabric and to discourage litigation. Most jurisdictions agree on those points — and only on those points. The rest of the elements of acquiescence are all over the map, excuse the pun. Some commentators argue that the doctrine does not apply to the Federal government; others extend that non-application to states and municipalities. It clearly applies to disputes *between* states; there are numerous Supreme Court cases where acquiescence proved controlling.

Generally, courts distinguish practical location from acquiescence by considering whether or not there was a formal agreement between the parties (see “Practical Location”; December 2005, in the online archives at www.amerisurv.com). Recall that practical location results

when parties put into effect an ambiguous agreement. The subsequent actions of the parties clarify the otherwise unclear pact. Acquiescence requires no formal agreement, but looks to those actions nevertheless. The quiet enjoyment by parties on either side of a demarcation line, over time, ripens into that line becoming the actual boundary between the parties. Sometimes. In some states, the original location of the boundary must be unknown to the parties for the doctrine to kick in; in others, that element is irrelevant. In some states, the line has to be visible; in others, not so much. In some states the occupation must have continued for the prescriptive period, while in others it must have occurred “for a long time” whatever that means. Standards like that drive technically-oriented people crazy. Because, although the courts are free to interpret fuzzy standards like that, no one else (surveyors, attorneys, title people, will be comfortable forecasting how a court would respond.

Okay, Now What?

Given all that, how should we include potential acquiescence in our analysis? It seems clear to me that our

first task is to forget everything we might have read on the subject not written *specifically for our state*. I can’t overstate this point. There seems to be no consensus across the country over what particular factors are necessary for acquiescence to move written boundary locations. Thus, inter-state debates over the subtleties of the doctrine are, at best, a waste of air, and at worst, likely to lead someone astray. Indeed, some states seem to have no appellate

decisions on the topic at all. In those jurisdictions, it is possible that acquiescence, as a boundary doctrine, *does not exist*.

Second, research your state’s appellate decisions on acquiescence, specifically focusing on the required elements for it to ripen. (A side note here: if you are one of the many surveyors who believe that expressing our opinions on adverse possession is outside of our bailiwick, put your pencils down now and close your booklets: your acquiescence experience is over. Proceeding further requires opening on unwritten acts and intentions.)

As I have pointed out before, gathering the relevant facts is the problem. Although it may be easy to determine the

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Boundaries by Acquiescence (continued)

current limits of occupation (emphasis on *may* here), determining the *longevity* of that occupation might prove more difficult. Factor in requirements as to the intent of both parties, and one should quickly realize opining on acquiescence is no walk in the park.

Opinionated Deficiency

Although I am a strong advocate for our being willing to opine on unwritten transfers of land as surveyors, the courts have several distinct advantages in this area. First, the courts can command participation of the involved parties. In contrast, parties are free to ignore us, and are not penalized for it. We can initiate all the contact we wish, but cannot compel response. Second, the courts can place witnesses under oath. In most jurisdictions, surveyors do not have that power. And, I'm sorry to say, even in those areas where we can elicit sworn testimony I suspect many people would lie

Thorough records are an indispensable part of an acquiescence opinion.

to us or stretch the truth if it suited their purposes. (Outside a court hearing, there is no real penalty for being untruthful. We have a former president to thank for that.) Finally, our results are not binding on either party. Should they be dissatisfied with our work, they are free to hire our competitor. (I point this out not to belittle our efforts, but to underscore the likely notion that people do not consider the analysis of a surveyor to have the same *gravitas* as a court proceeding. Thus, they can pick and choose what they say to us.)

Thorough records are an indispensable part of an acquiescence opinion. Signed affidavits by owners on either side of the line, stating the nature of their intent and understanding of the boundary line, as well as the age of the occupation, go a long way toward documenting the unwritten transfer. It's not that unwritten transfers are not good for society (they, of course, are), it's that the facts giving rise to their operation can be hard to reestablish as the years roll by. Sometimes the only fact left is the name of the surveyor who opined that the trespass ripened into title.

Tread carefully here. I can't think of a single doctrine laden with more minefields for us. 🇺🇸

Joel Leininger is a principal of S.J. Martenet & Co. in Baltimore and Associate Editor of the magazine.

As seen in the "Georgia Land Surveyor", Jan./Feb. 2009

MSPS Annual Meeting

October 15-17, 2009

St. Louis Airport Marriott, St. Louis, Missouri

Thursday, October 15, 2009

7:00 am	Registration & Continental Breakfast
8-10:00 am	Minimum Standards with a Twist ... Jim Mathis, PE, PLS Minimum Standards — are they general guidelines or the letter of the law? Who are they designed to protect — the client, the general public, or the surveyor? Are they too restrictive or do we need to tighten them up? What a practicing surveyor needs to know about the laws regulating the day to day operations of our profession. (Or, how a Missouri licensed Professional Land Surveyor can meet his/her continuing education requirements in Minimum Standards for four years.)
10-10:30 am	Break
10:30-12 noon	Minimum Standards with a Twist, continued
12:00-1:00 pm	Lunch Provided
1:00 pm	Golf Tournament, Location TBA
1:00-2:30 pm	Limiting the chances of and preparing for being a defendant ... Dr. Richard Elgin, PE, PLS In this litigious society practically anybody can sue anybody for anything at any time ... and they do. Particularly due to the nature of our profession, a surveyor can easily become a defendant in a lawsuit for a myriad of reasons: A misunderstanding between client and surveyor as to scope of services provided, the survey's price, cutting a shrub, dissatisfaction with the survey's results, trespassing, surveyor revealing results to a third party, client's (or third party's) misuse of the survey. Becoming a defendant is practically always an uncomfortable and expensive experience. Can it be avoided? Not entirely. Can the surveyor be well prepared if sued? Absolutely, yes. Can the affects of being sued be minimized? Yes. How? These questions will be answered in this seminar. Letters, contracts, phone logs, project documentation and the use of surveyor's notes on plats can all help in defending the surveyor. All will be discussed and some examples provided in the seminar handouts. While there's no "magic potion" that makes one immune from being sued, one can prepare.
2:30-3 pm	Break
3:00-5:00 pm	Limiting the chances continued...
5:00-7 pm	Exhibitor Set up

Friday, October 16, 2009

7:00 am	Registration, Continental Breakfast and view exhibits
8:30-11:30	Business Meeting
11:30-1:30 pm	Lunch Provided and Recognition of new PLSs and LSITs
1:30-2:30 pm	A. Did you know there are no differences between "grid" and "ground" ... Dr. Joe Paiva, PE, PLS Surveyors do more and more work on some kind of a grid, the most common being an arbitrarily defined "tangent plane" system. When combining GPS with terrestrial measurements such as those from total stations, the magic of software in the field office computers is brought in to solve the "issues." But what are these issues? What is being solved? What does the surveyor need to keep in mind? State plane coordinates or other officially designated projections are often used when this kind of combining is done. There are many other reasons for using an official plane coordinate system as well. But perhaps because of a lack of understanding of the mathematics that is involved, contractors, engineers, architects, and the surveyors themselves, get into a world of trouble because things don't apparently fit. This happens for a variety of reasons. Some are due to the fact that courses are published as grid distances and grid bearings and coordinates are published as grid values. In this course a basic explanation of how projections work is covered, followed by an easy to understand primer on geodetic concepts. Various strategies for communicating the issues and how stakeholders work with the published surveying information will be covered. Bringing a calculator to this course is suggested so that participants can do simple calculations to verify the equations presented. The material is much more likely to be understood and remembered this way.
	B. Land Surveyor and Engineer Liability ... Jeff Lucas, JD What is your liability as a professional engineer or land surveyor? Do you have protection because you work for a large corporation? What if you are a solo-practitioner? Are you liable to third parties with whom you have no contractual relationship? These and other issues will be the subject of this seminar, designed to give the professional engineer and land surveyor answers to these and other important liability questions. What is the role of contracts and insurance in protecting the professional from liability? Will I have to take my liability to my grave? Important doctrines of the law and courts cases will be discussed to provide these answers. Are there some easy steps that I can take as a professional to limit my liability? Yes there are, and some of those will be discussed and explained.
2:30-3:00	Break to view exhibits
3-5:00 pm	A. Differences between grid and ground, continued

5:30 pm B. Land Surveyor and Engineer Liability, continued
 Reception with exhibitors
 6:30 pm Banquet, awards and installation of new MSPS officers and Board

Saturday, October 17, 2009

7:00 am Registration, Continental Breakfast and view exhibits
 8-10:00 am A. ALTA/ACSM Land Title Survey for Field Personnel ... Gary Kent, LS
 This program will help field personnel and surveyors more fully understand the field aspects ALTA/ACSM Land Title Surveys and to put such surveys in the proper context. Emphasis is placed on understanding the purpose of Land Title Surveys, uncertainties in survey measurements, Relative Positional Accuracy and the field aspects contained within the base standards and in Table A. Questions are encouraged and there is ample time for questions and answers.
 B. Court Case in Missouri ... Gary Bockman, PE, PLS
 This course will explore some cases that have set the precedents that results in commonly used legal principles of boundary surveying and some unusual court rulings that can affect land surveyors. The focus will be on the reported facts of the cases and what specific items were considered by the court of jurisdiction. The unusual cases reviewed will be a guide for what a land surveyor can do to help the client and the client's attorney ensure that a complete discussion of surveying evidence found is presented.
 10-10:30 am Break to view exhibits
 10:30-12:00 pm A. ALTA/ACSM Land Title Survey, Continued
 B. Court Case in Missouri , continued
 12:00-1:00pm Lunch provided
 1:00-2:30 pm A. Preparing a Survey Report ... Gary Kent, LS
 This program will present the concept of a surveyors report and discuss what information is relevant and desirable to include in such a report. Included will be an interactive dialogue with the audience on who will benefit from a surveyors report, what information it should and could include, and how it should be organized to best meet those objectives. A sample survey will be used as the basis for the discussion.
 B. Pin Cushion Effect or "The Multiple Monument Dilemma"... Jeff Lucas, JD
 In the year 2008, in some parts of the country, 160 years or more have lapsed since the last Deputy Surveyors of the General Land Office left the field. In that time span we have seen the loss of the monuments that once stood on the corners of our sectionalized nation. But in their place, like sprouts popping out of the earth from planted seed, we are seeing a proliferation of corner monuments. The problem isn't just confined to the sectionalized lands, but it has manifested itself in the Lot and Block, and Metes and Bounds surveying arenas as well. This phenomena has taken on several different names: "Pin Farm," "Pipe Factory," "Monument Mania," "Steel Mill," and the like. But the one name that seems to have risen to the top is "Pincushion." This seminar will explore the causes and the effects of the pincushion phenomena. This study will include the surveyor's misunderstanding and/or misapplication of surveying principles, rules of evidence, and the law. The participants will study solutions found in case law and explore remedies to many common problems. Power Point presentation.
 2:30-3:00 pm Break
 3-5:00 pm A. Preparing a Survey, continued
 B. Pin Cushion Effect, continued

This course has requested to be approved for 20 PDUs by the Missouri board for Architects, Professional Engineers, Professional Land Surveyors and Landscape Architects.

HOTEL ACCOMMODATIONS

The Marriott St. Louis Airport is the site for the 2009 Annual Meeting of the MSPS. A special rate of **\$70.00 for single, double, triple or quad room has been extended until September 15, 2009**. Reservations can be made by calling 866-661-8953 or 877-265-8771 or 314-423-9700. Ask for the Marriott St. Louis Airport and identify yourself with Missouri Society of Professional Surveyors Annual Convention. **Parking is complimentary for all guests and attendees.**

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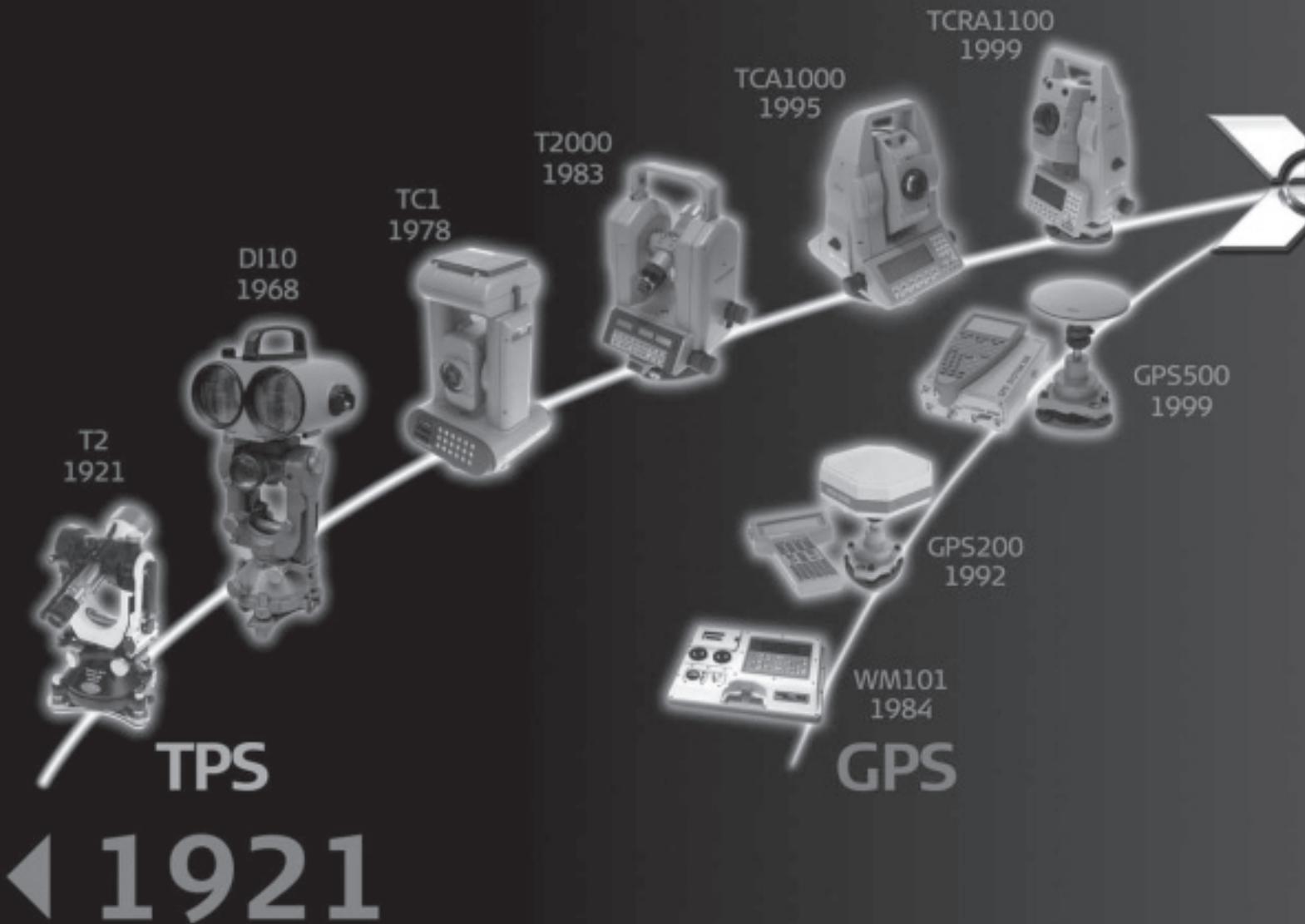
From I-55 North (Memphis, New Orleans): Take I-55 North and take the exit for I-270 North. Head north on I-270 and take exit 232 heading east on I-70. Take exit 236 and the hotel is straight ahead at the end of the exit.

From I-70 East (Kansas City, Columbia): Head east on I-70 and take exit 236. The hotel is straight ahead at the end of the exit.

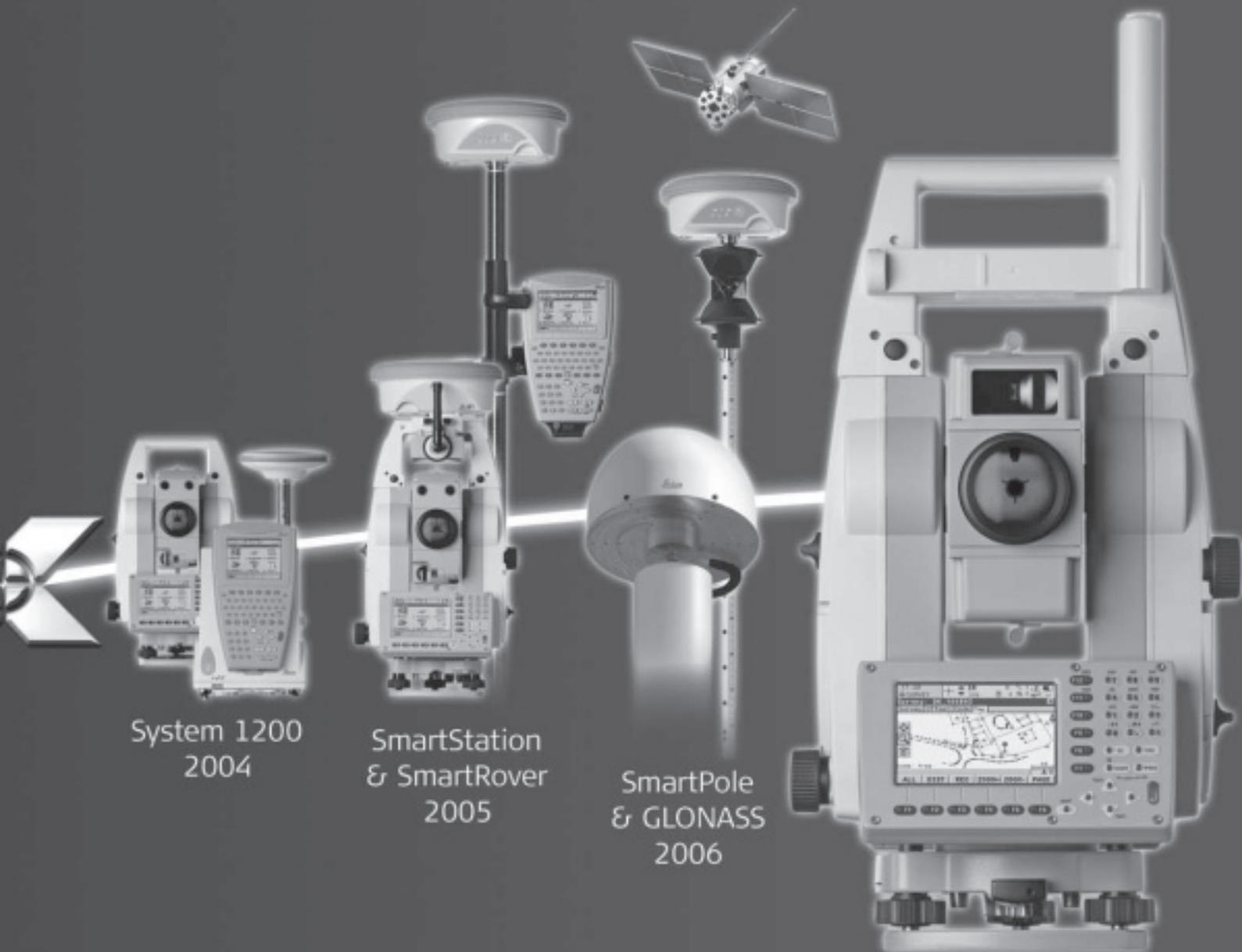
From I-70 West (Indianapolis): Head west on I-70 and take exit 236. At the end of the exit take a left. The hotel is straight ahead on the right.

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Tapes, Transits, and Total Surveying

by Andrew C. Kellie, PLS, Department of Industrial & Engineering Technology, Murray State University, Murray, KY 42071, andy.kellie@murraystate.edu

The other day I watched a field crew using a total station measure the distance from the top of a low ridge to a point on some fine bottom land. The telescope pointed downward, the person at the reflector looked upward, and the LCD display on the total station blinked the horizontal distance. A glance at the backsight, a glance at the foresight, and the total station blinked the horizontal angle. I was impressed; the field crew wasn't.

Those of us who grew up professionally in the era of the steel tape and one minute transit remember well the term "breaking chain". The term was a figurative one (usually) and the process was necessary on steep ground (always) so that the field crew could return a horizontal measurement. In breaking chain, the field crew (Yep, real chainmen!) would measure distances less than a full tape length. The distances obtained while "breaking chain" were summed (usually correctly) in order to get the horizontal measurement on the line.

While breaking chain was no big deal in the flatlands, in the mountains the process probably was responsible for more than one surveyor considering a change of profession. The avant garde among us resorted to the use of a tape 200 feet long and measurement from the trunion axis on the transit telescope. Pointing the telescope on the fingers of the head chainman gave a vertical angle that could be used to reduce the slope measurement to the horizontal. The remainder of the line could be taped by breaking chain. Provided that the chaining crew got along with one another, the taping was characteristically done in a precise (i.e., repeatable) manner. Indeed, a contented crew could routinely get taping precisions of 1/5,000 or better in normal work.

The result of this prodigious effort was a measurement positively ripe for correction! The happy person who got to reduce the notes had to correct each field measurement for the calibrated length of the tape, temperature, tension, and sag. The equations used to do this were perfect prodigies of physics, but the result of the correction was a reliable distance measurement, either slope or horizontal as the case might be. If the measurement was a slope distance it had to be reduced to the horizontal. This could be done using $H_{AB} = (S_{AB})(\cos v)$ (1)

where H_{AB} = horizontal distance; S_{AB} = slope distance; and v = vertical angle. The vertical angle was used because that was

how the vertical circle of a one minute transit was graduated; zenith angles weren't used until the introduction of the optical theodolite. Because the measurement had been corrected for systematic error, the measurement was not only precise (repeatable) but accurate (close to the true value).

The simplicity of electronic distance measurement obscures a positively impressive process. Most of us learned in middle school that the speed of light is 186,000 miles per second. We regularly trotted out this immense number on science tests and even dropped it into dinner conversation to forestall the inevitable question, "What did you do in school today?" It never failed to impress, and with honor satisfied, conversation could be steered into less dangerous channels. Then the number passed into obscurity — until we encountered electronic distance measurement.

From basic physics we know that

$$d = v \cdot t \text{ (2)}$$

where d = distance; v = velocity; and t = time. The difficulty in using this equation and our knowledge of the speed of light with survey measurements is that physicists work in a vacuum (at least when measuring the speed of light they do, because the neat number we learned in middle school is correctly defined as the speed of light in a vacuum). So if we are to use equation (2) for computing distance, we are going to

have to correct the speed of light in a vacuum to reflect the conditions under which we make our measurements. In reality (i.e., the real world of surveyors as opposed to the vacuum of physicists), the speed of light is slowed by the air it transits during a measurement. The slowing of light is estimated using the *index of refraction* of the air. Mathematically,

$$v = \frac{V}{c} \text{ (3)}$$

where v = velocity of light in air; V = velocity of light in a vacuum; and c = index of refraction of the air. The index of refraction can be shown to be a function of air temperature and pressure. Using the measurements of temperature and pressure we enter into the total station, the instrument computes the index of refraction and applies it to the speed of light in making the measurement of the slope distance. With a little trigonometry, the slope distance can be displayed as a horizontal distance happily blinking at the instrument person at the total station. Because the

Those of us who grew up professionally in the era of the steel tape and one minute transit remember well the term "breaking chain".

Tapes, Transits, and Total Surveying (continued)

measurement is corrected for systematic error, the measurement is not only precise (repeatable) but accurate (close to the true value).

Three things can be said about electronic distance measurement: (1) It depends on temperature and atmospheric pressure, (2) Corrections are computed by a very complex set of equations solved by your total station, and (3) If you don't provide the necessary data for your total station to make the correction, your distance measurements are probably going to contain error.

Angular measurement with the one minute transit was much the same as with the total station — except the blinking part. With the one minute transit, the surveyor blinked, not the instrument. Any surveyor who had been on the job longer than about two hours could be recognized by a magnifying glass worn about the neck.

Regardless of the instrument used for the work, angular measurement must be made directly above the point and in a horizontal plane. If the instrument isn't directly above the point, the measured angle will be eccentric to the station. This will make the measured angle incorrect — either too large or too small, rarely just right. We get directly above the point by using a plumb bob (on the one minute transit) or by

using an optical plummet or laser (on modern instruments). Regardless of technique, if the plummet is out of adjustment our angular measurement is eccentric and incorrect — either too large or too small, rarely just right.

We put an instrument into the horizontal plane by centering the level bubble over both axes of the instrument. Assuming that the bubble stays centered over both axes, it will stay centered as the instrument is revolved about the vertical axis. This happens because leveling the bubble on the two axes defines a horizontal plane (a principle that follows from high school geometry class, but a principle that was probably overlooked and not fully appreciated at that time). If we make an angular measurement without carefully leveling our instrument, the angular measurement will be incorrect — either too large or too small, rarely just right.

Something else that follows from geometry is the angular check expected of the field crew. Because a closed traverse is nothing more (geometrically speaking) than a closed polygon having n angles, the sum of the interior angles in the traverse is found from

$$\Sigma = (n-2) 180 \dots\dots\dots (4)$$

(continued on page 26)

2009 Scholarship Recipients



Aaron J. Bolton



Lance J. Loethen

Aaron John Bolton and Lance J. Loethen were chosen as the recipients of the 2009 Robert V. Pirrie Memorial Scholarship. Aaron Bolton, of Gravois Mills, Missouri, will attend the University of Missouri-Columbia and Lance Loethen, of Russellville, Missouri, will attend Linn State Technical College.

Non-traditional scholarships were awarded to Marcus Perrine of Higginsville and Corey Braker of Liberal. Marcus is a student at Missouri State University and works for Nolte Land Surveying. Corey is a student at Missouri Southern State University and works part-time in a land surveying office in that area.

Good luck and congratulations. 

Tapes, Transits, and Total Surveying (continued)

where Σ = sum of the angles; and n = number of angles. (I recall witnessing a heated argument in geometry class about whether n was the number of *angles* or n was the number of *sides* in a closed polygon. It got so heated, I had to check. Yep! No matter how many sides or angles are in the polygon, the number of sides and angles are equal!!

It has always amazed field crews that even though doubled angles at each station are well within company standards, there still can be error — or even (gasp!) a *mistake* — in the traverse. Small discrepancies are the result of otherwise excellent measurements incurring small amounts of random error; large mistakes are the result of otherwise excellent measurements made between the wrong points. For example, perhaps the stakes used for the backsight is not same stake just occupied. The crew still can measure an excellent angle. Unfortunately, however excellently the angle is measured, it still isn't part of the traverse being survey.

Three things can be said about angular measurement: (1) The instrument has to be in a horizontal plane if the angle is to be measured correctly, (2) if the instrument is not vertically above the station, the measurement (and perhaps the

surveyor) will be eccentric, and (3) no matter how well you measure an angle, if you measure between the wrong stations the results of your work will probably be in error.

The instruments surveyors use for field work are just plain fascinating. Compared to the plastic protractor used in high school geometry, the one minute transit has 60 divisions between each of the degree marks on the protractor. A one second total station has 3600 divisions in the same space. An error of 0.02 feet in a taped distance of 100.00 feet results in a relative precision of 1/5,000. the same error of 0.02 feet in a distance of 2,000.00 feet measured with electronic distance measuring equipment results in a relative precision of 1/100,000.

But technology has its drawbacks too. A steel tape has the mark "1/2 RR gage" stamped on it. A similar mark isn't found on a total station instrument. Do you remember how important you felt when you learned what "1/2 RR gage" actually meant? For the rest of the day, you wondered just how many ordinary people actually were privy to such advanced technical information. But *you* knew. Isn't it *great* to be a *surveyor*? 🇺🇸



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Are You Smarter Than a Missouri S&T Sophomore?

by Dr. Richard L. Elgin, PLS, PE

Adjunct Professor of Civil Engineering, Missouri University of Science & Technology, Rolla, Missouri

Here's a problem, taken verbatim from a recent Missouri University of Science & Technology (MS&T, formerly UMR) Civil Engineering 001, "Surveying" Final Exam. The Exam is closed book, open calculator. The general equation for elevation along a vertical curve was given on the exam (see below), and none other. Using only your calculator, give yourself about 10 minutes and work this problem. (This would be a good NCEES "Principles and Practice" problem.)

For a curve system, the azimuth from the PC to the PI is $140^{\circ}40'$, delta is $52^{\circ}52'$ left and the PT station is $96+96.96$. The degree of curvature is $8^{\circ}00'00''$.

At $91+42.85$ is a BVC for a vertical curve whose length is 1500 feet. For the vertical curve, $g(1)$ is $+8.7\%$ and $g(2)$ is -3.3% . Compute the horizontal coordinates and elevation for station $95+11.26$. The coordinates for the curve's RP are: 10,000.00 north, 8000.00 east. The BVC elevation is 555.55 feet.

$$Elev = \frac{g_2 - g_1}{2L} x^2 + g_1 x + Elev\ BVC$$

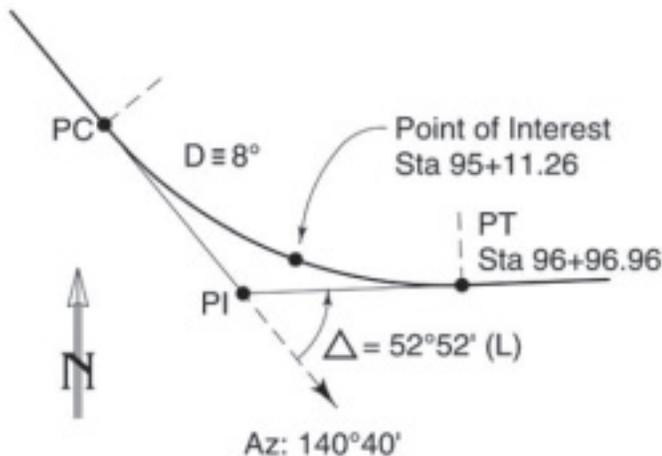
Editor's Note: Solution below. 🇲🇴

Solution to "Are You Smarter Than a Missouri S&T Sophomore?"

by Dr. Richard L. Elgin, PLS, PE

Adjunct Professor of Civil Engineering, Missouri University of Science & Technology, Rolla, Missouri

Faced with any problem, what does one do? DRAW A SKETCH!



First the horizontal curve part:

$$PC\ Sta = PT\ Sta - L$$

$$\text{Since } D = 8^{\circ}, R = 716.197'$$

$$\text{With } \Delta \text{ and } R \text{ known, } L = 660.83' (L = 2\pi R\Delta/360^{\circ})$$

$$PC\ Sta = 90+36.13$$

Deflection angle at PC to Station $95+11.26$

$$\text{Defl. angle} = (95+11.26 - 90+36.13) (8) / 200$$

(Defl. angle = $\Delta/200$)

$$\text{Defl. angle} = 19^{\circ}00'19''$$

$$\text{Azimuth, PC to Point} = 121^{\circ}39'41''$$

$$\text{Subchord, PC to Point} = 466.47$$

$$(\text{Subchord} = 2R\sin(\text{Defl. angle}))$$

$$\text{Coordinates of PC} = 9546.05\ N$$

$$7446.04\ E$$

Therefore, coordinates for Station $95+11.26$:

$$9301.20\ N$$

$$7843.08\ E$$

Now the vertical part:

$$Elev = \frac{g_2 - g_1}{2L} x^2 + g_1 x + Elev\ BVC$$

x is the distance, in Stations, from BVC to the point, which is 3.6841

$$Elev = \frac{-3.3 - 8.7}{(2)(15)} 3.6841^2 + (8.7)(3.6841) + 555.55$$

$$Elev = 582.17\ \text{ft} \quad \text{🇲🇴}$$

Right of Entry?

by Robert Dean, PLS



The Land Surveyors Association of Washington is considering legislation to assert “right of entry” onto private property. By asserting a right of entry I mean we would petition the State of Washington Legislature for a previously unrecognized right: the right for surveyors to enter land owned by a third party in order to properly survey a different property. Nothing has been decided; the Board of Trustees will

research the idea.

To guide their research, the Board will have to answer four questions:

- Can we do that?
- Do we want to ?
- Is it right for Washington?
- Are there alternatives?

We would not want to solve a non-existent problem. It would be informative to poll Washington surveyors excluded from property in the course of their work. How did they resolve the boundary uncertainties? What liability questions remain unanswered? Could similar problems arise for other surveyors? The membership might back a proposal if the benefits to us outweigh the risks. That would be half the battle won. The second half, winning over the public, will be more difficult.

Washington Legislature

Article 1 Section 1 of the constitution specifies the purpose of the Washington State Legislature: to protect individual

rights, including private property rights. We should not lose sight of that, neither should they. Sometimes, it seems the legislature is there to dole out privileges to special interest groups represented by lobbyists.

Can we do that?

Who owns the land? If Washington State owned the third party land, it would have the right to exclude or grant entry to whomever it wished, and we would be right to petition it for a right of entry to land it controlled: that is the essence of ownership. Sir William Blackstone, a father of Western law often cited by U.S. courts,¹ defined property ownership as, “that sole and despotic dominion which one man claims and exercises over the external things of the world, in total exclusion of the right of any other individual in the universe.”²

Otherwise, is it unlike asking Farmer Brown for permission to enter Farmer Jones’ land?

A right of entry to property controlled by the State, or the U.S. Government, may well be worth considering. It might be in the public interest to afford surveyors access to railroad rights of way, utility manholes, county road pavements, freeways, ports, dams, and military bases. After all, this is a community, and we are all in it together. However, if what has been passed in other states is an indication, surveyors want a right to enter private property, free from charges of trespass³.

Private Property

Private property is hallowed ground in our society. We should be careful how those charged with its protection might

(continued on page 30)



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Right of Entry? (continued)

regard us when we come before them with our petitions. The Washington State Constitution Article 1 Section 32 mandates, "A frequent recurrence to fundamental principles is essential..." Before we approach the Washington State legislature with our proposal, we should take the State's admonition to heart: we should examine first principles.

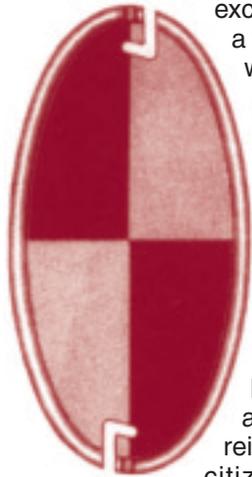
- John Lock asserted in his famous Second Treatise on Government (1689), "The great and *chief end* therefore, of men's uniting into commonwealths, and putting themselves under government, *is the preservation of their property.*"⁴
- John Adams: "The moment the idea is admitted into society that property is not as sacred as the laws of God, and that there is no force of law and public justice to protect it, anarchy and tyranny commence. Property must be secured or liberty cannot exist."⁵

Land Surveyors, of all people, should hold the fundamental principle of private ownership of land in the highest regard, almost as sacred.

Right to Exclude

Scholars describe private property ownership as a bundle of sticks or bundle of rights. The U.S. Supreme Court declared one of those sticks, the right to exclude, "...to be a fundamental element of the property right."⁶ Furthermore, in at least three recent cases, the U.S. Supreme Court has ruled that the taker must compensate the property owner if it takes that right to exclude.⁷ Therefore, if the State grants us

a "right of entry" onto private property, it will have violated the private property owners' constitutionally protected "right to exclude." Under the Washington constitution, someone must pay for that taking, in advance, with money.⁸



Compensation

Laws in other states do not provide for reimbursing the private property owners for taking their right to exclude. At most, the Oregon statute allows the landowner to charge the surveyor with a minimum fee, of \$100.00, as reimbursement for actual damages.⁹ The citizens of Washington may view any meager offer of compensation, such as restoration of losses due to damage, as insulting. It simply skirts the constitutional issue of taking landowners' right to exclude.

Nevertheless, we should propose a compensation scheme when we present our bill to the people of this state. Otherwise, a hapless surveyor, sued for trespass, will find scant protection in our law if it is later overturned, or even challenged in the suit, as unconstitutional.

Some may dismiss landowners' objections, or seek to diminish their claims, by pointing out that landowners may benefit from a free survey, paid for by the neighbor.¹⁰ However, the Washington constitution precludes deducting the value of any benefit from the amount of due compensation.

Way of Necessity

Surveyors need more than just entry onto the property: we need to be free to move about and conduct our investigations, observations, and measurements. We need a right of "way", or "wayleave", or "way in gross".¹¹ The Washington constitution allows taking "private ways of necessity", provided, we justly compensate the affected neighbors. A landowner may sue his neighbor to condemn a right of entry, and ingress and egress, under Revised Code of Washington statutes Title 8. We could modify these statutes to add land surveying to the list of covered activities and uses.¹²

This would yield a costly solution, but be applicable to only the most vital of surveys and difficult of circumstances. Our clients would bear most of the costs, political and monetary, and they would rarely invoke the law. For these reasons, our members may be more likely to support this approach.

Public Use

In Washington, private property cannot be taken at all unless it is for a private way of necessity or a *public* use. If we fail to convince the legislature that our work qualifies for application of "way of necessity" statutes, we can still argue for public use.

However, the constitutional provision: whether the use is truly public, is for a court to decide each time, regardless of prior legislative declarations means that each surveyor, when sued, will have to defend his "right of entry" anew. Each surveyor will have to employ some clever lawyers to argue public use, to a jury, for when Mom and Pop have to surrender part of their property rights to a private practice land surveyor so he can survey for the development next door at minimal cost and inconvenience to his wealthy client.

Even if we win each lawsuit, we will bear the expense, through legal fees, settlement costs, and elevated insurance premiums, of raising the issue to prominence. Alert insurance companies will adjust our premiums upwards immediately upon passage of any such "right of entry" law in Washington.

Do we want to?

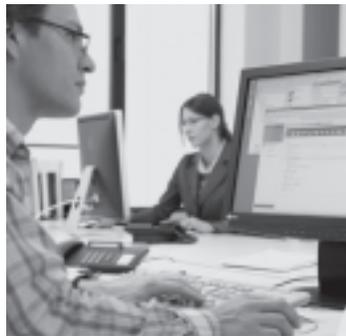
Some may have moral objections. Even if we follow the constitution, show that our taking is for a qualifying or public use, and justly compensate private property owners for their loss of the right to exclude, can we feel good about what we will have done? We remember the political backlash from the *Kelo* case.¹³ The U.S. Supreme Court¹⁴ ruled that the City of New London, Connecticut had the right, with an adequate, though contrived, excuse for public use, to take property rights from a *less* powerful private individual and give them to another *more* powerful private individual. They can do it, if they date. The City, to this day, has not been able to gather the political will to complete its redevelopment.¹⁵

Thomas Jefferson once said, "Nothing is ours, which another may deprive us of."¹⁶ It is a matter of decency and respect. For most of us, our house and land are all we have. Surveyors should honor that.

(continued on page 32)



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Right of Entry? (continued)

There are ethical considerations. If surveyors were awarded the right of entry onto private property, could we say, in good conscience, that we deserve it? For every instance I could have used a “right of entry”, I know of several other examples of a surveyor’s (self included) arrogant trespass. Who has not had a call from an irate landowner about painted-up control, ribbon littering the woods, or random traverse stakes on the wrong side of line? What did you tell your crews about climbing over a fence to set a “PROP COR” in someone’s lawn? As uncomfortable as we felt in those situations, the solution is not to give ourselves a spurious right to lawful trespass, the solution is to teach our field crews respect for private property rights of others.

There are questions of pragmatism. Oregon was alert to impose restrictions on surveyors’ activities with their right of entry statute, in token protection of landowners’ rights; and that, over the objections of some surveyors.¹⁷ Yet, one wonders if many Oregon surveyors now regret having instituted the law, especially since the Oregon State Board of Examiners for Engineering and Land Surveying is now actively prosecuting an abundance of right of entry cases.¹⁸ Who can prevent our crews from inadvertently stepping over a line? If any and every surveyor risks violating a law in her everyday practice, then she also risks a suit by her client for jeopardizing the project. A right of entry statute, itself, may not be onerous, but it may introduce an unwelcome gateway to other litigation targeting our projects.

Is it right for Washington?

Is it right for Washington? It would depend on whether the legislature has the constitutional authority to deny a landowner’s right to sue for trespass. Do we want to? That will be for the membership to decide. It may well decide that any such bill would be too cumbersome and impractical to proceed. If our purpose is to reduce lawsuits, we are unlikely to support a bill that does the opposite.

Our bill should specifically address compensation for taking the right to exclude. The compensation offer should be generous enough to induce the landowner to waive his/her right to have a jury decide the amount, and to sign off on public use. A fair suggestion might be an hourly fee, equivalent to the surveyor’s usual crew rate, for the time the surveyor, personnel, materials, or equipment, spend occupying the soil of the third party property. However, we may not deduct any alleged benefit from the compensation package.

What would we call the bill? Not “Right of Entry”. Surely, a wily wordsmith could invent a more appropriate title: one that reflects our purpose to fulfill our mission, showing deference to the private property rights of our friends, family, neighbors, and fellow Washington citizens.

Are there alternatives?

In Washington, surveyors are licensed: “...to protect and maintain individual rights.” Before we spend too much money on public relations and lobbyists, perhaps, we should hone our message. Maybe we should set aside time, in our strategic plan, to contemplate our licensure. Then, while our relationship with private property rights is in the fore, we could take the opportunity to guide our members, and educate the public on the value of our work. To that end, the Board of Trustees could organize workshops, and propose guidelines, to help members deal with difficult situations involving access to monuments. With frequent recurrence to fundamental principles, we will have many opportunities to promote the profession and science of surveying for the benefit of our members and the public.¹⁹ 

References: (Endnotes)

- 1 William Carey Jones, ed., Blackstone, Sir William, *Commentaries on the Laws of England*, (Baton Rouge: Claitor’s Publishers, 1976). *Concerning the Commentaries*, xxvii, www.blackstoneinstitute.org/sirwilliamblackstone.html
- 2 Sir William Blackstone, 1765-1769 *Commentaries on the Laws of England Book 2 Chapter 1* www.lonang.com/exlibris/blackstone/bla-201.htm
- 3 “Approximately half the states have laws that permit surveyors in the performance of surveying services to enter upon lands without permission or legal consequences.”— Knud E. Hermansen, *Surveyor’s Right of Entry Laws*, <http://www.umaine.edu/set/svt/Articles/rightofEntry.pdf> http://www.nspsmo.org/resources/RIGHT_OF_ENTRY_CMT_REPORT_10_2006.PDF
- 4 John Locke, *Two Treatises Of Government*, (1689), Second Treatise, Chapter IX, Sections 123-24. http://www.constitutionalfreedomfoundation.org/Articles/constitutional_primer_7.htm
- 5 “Discourses on Davila,” in Charles Francis Adams, ed., *The Works of*

(continued on page 34)



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Right of Entry? (continued)

- John Adams*, 10 Vols. Vol. 6 p. 280. http://www.constitutionalfreedomfoundation.org/Articles/constitutional_primer_7.htm
- 6 "The right to exclude, so universally held to be a fundamental element of the property right, falls within this category of interests that the government cannot take without compensation." *Kaiser Aetna v. United States*, 444 U.S. 164, 176 (1979).
 - 7 *Kaiser Aetna v. United States*, 444 U.S. 164, 1979.
Nollan v. California Coastal Com., 483 U.S. 825 (1987)
Dolan v. City of Tigard, 512 U.S. 374 (1994)
 - 8 Washington Constitution Article 1 Section 16.
<http://www1.leg.wa.gov/LawsAndAgencyRules/constitution.htm>
 - 9 Oregon Revised Statutes, ORS 672.0247 *Right of entry by land surveyor; compensation for damages caused; notice; removal of survey markers. "...the surveyor shall compensate the landowner for all other actual monetary damages, or \$100, whichever is greater."*
www.leg.state.or.us/ors
 - 10 Knud E. Hermansen, *Surveyor's Right of Entry Laws*, "I don't have any problems personally with the law because 99% of my work is in the forest areas where most land owners are happy to have you tie or locate a corner." <http://www.umaine.edu/set/svt/Articles/RightofEntry.pdf>
<http://www.nspsmo.org/resources/RIGHT-ENTRY-CMT-REPORT-10-2006>.
 - 11 Henry Campbell Black, *Black's Law Dictionary*, West Publishing Co.
 - 12 RCW 8.24.010 *Condemnation authorized — Private way of necessity defined.* <http://apps.leg.wa.gov/RCW>
The question of whether land surveying qualified for ways of necessity hinges on meanings, in the Constitution Article 1 Section 16, derived from double negatives, commas, and the word "and" and "or". To simplify the interpretation, and clear the air of bias, try submitting words in the troubling sentence while preserving its structure. For example, in place of:
 - "Private property shall not be taken for private use, except for private ways of necessity, and for drains, flumes, or ditches on or across the lands of others for agricultural, domestic, or sanitary purposes." substitute "You may not borrow the car, except for essential purposes, and for driving to and from school, work, or church functions."
 - 13 See the October 2006 article by Nicole Stelle Garnett "The Neglected Political Economy of Eminent Domain" in *Michigan Law Review* Vol. 105:101 <http://michiganlawreview.org/archive/105/1/garnett.pdf>
 - 14 *Kelo v. City of New London* 545 U.S. 469 (2005).
 - 15 "The City and NLDC may have won in court, but ... they have lost the support of Connecticut citizens." *North Country Gazette*, October 21, 2005, *City of New London Fires Eminent Domain Corporation* <http://www.northcountrygazette.org/articles/1021105EminentDomain.html>
 - 16 Thomas Jefferson to Maria Cosway, 1786, *The Writings of Thomas Jefferson, Memorial Edition 5:440* (Lipscomb and Bergh, 20 Vols, Washington, D.C., 1853-54). <http://etext.lib.virginia.edu/jefferson/quotations>.
 - 17 Knud E. Hermansen, *Surveyor's Right of Entry Laws*, "...Some surveyors say they don't like the law because now they have to give notice prior to entry which causes delays in getting the job done. Before the law, they could quietly tie a corner just inside an adjoinder without disturbing anything and then be gone. Now, if they do that and get caught they are subject to disciplinary action by the Board." <http://www.umaine.edu/set/svt/Articles/RightofEntry.pdf>
http://www.nspsmo.org/resources/RIGHT_OF_ENTRY_CMT_REPORT_10_2006.
 - 18 From July 15, 2005 through September 6, 2007 the board imposed sanctions in 16 cases involving land surveying, 4 of those cases related to violations of the right of entry statute. One surveyor was fined because his crew set a traverse point out in a clear-cut to side-tie a corner. *The Oregon Examiner* — Winter 2007. <http://www.osbeels.org/>
 - 19 See the Land Surveyors' Association of Washington, *Our Mission.* <http://www.lsaw.org>

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The Surveyor's Compass

by Richard F. Lunna, L.S.

The compass has been used for many centuries as an instrument for determining direction. It consists of a brass frame with *compass box* and two *sight vanes*. It is mounted to a light-framed tripod or Jacob's staff by means of a ball and socket joint. The circular-shaped compass box is covered with a protective glass plate or disc and contains a horizontal circle which is graduated in degrees and half-degrees from two opposite zero points designated as N(orth) and S(outh). The readings increase 90 degrees clockwise or counter-clockwise to the E(ast) and W(est) designations of the circle. At the center of the circle a long, slender needle is balanced upon a hardened *pivot*. The needle is magnetized at one end which allows it to swing horizontally about the pivot until it points in a fixed direction towards the earth's magnetic pole. It is raised from, and lowered onto the pivot by means of a lever which is actuated by a knob on the bottom of the frame. This lever secures the needle and helps to reduce dulling the pivot during transportation of the compass. The compass is leveled by means of either one circular, or two spirit levels set at right angles to each other on the frame. The sight vanes are secured to opposite ends of the frame and are aligned with the North and South points of the circle. This permits the observer to precisely aim the compass along a chosen direction. The rear vane contains a narrow slit, through which the observer sights a thread or horse hair stretched vertically in the forward vane towards the *foresight*. The ball and socket contains a spindle which allows the compass to be rotated about a horizontal plane and clamped in any position.

The compass provides a fast and easy way to determine direction. The tripod is set over a point and the compass is leveled then pointed in the desired direction. Next, the needle is lowered onto the pivot. Once the needle stops swinging and points towards north, the direction of *bearing* of the sighted object is read from the horizontal circle. It is read from one of the four quadrants: Northeast, Northwest, Southeast or Southwest. The bearing is merely the angle in degrees from North towards East or West, or from South towards East or West. Suppose we set up on Point A and point the sight vanes of the compass towards Point B. The needle settles on N 45° W. This reading indicates an interior angle of 45° is being measured (clockwise) between two directions, the first from Point a towards the magnetic pole, and the second from Point A towards Point B. Note that the East and West designations on the compass dial are reversed in order for the reading to be the correct quadrant when an observation is taken. Refer to Exhibit A.

The surveyor's compass can be used in a couple of different ways. One is for running a *traverse line* along a desired route or boundary. A traverse is a meandering, connected series of lines with an observed direction and distance. As cited in the example above, the compass is first pointed towards the foresight. The bearing is observed and the distance is measured. The surveyor advances along the traverse, at each setup recording the *backsight* bearing toward the previous point, and the foresight bearing towards the next. When plotting the results, these two bearings are averaged to help refine the directional accuracy. At each setup, offset measurements

are made to tie in existing fences, walls, brooks or other evidence recovered as the survey progresses.

The second use is for "pushing line" on a fixed bearing to determine and mark new boundaries. This would have been the primary function of the compass during early surveys of town lines, town allotments and subdivisions. In this procedure a compass direction is *set* according to the needle. That is, the compass is rotated, adjusted and then clamped with the desired bearing is read under the north end of the needle — just the opposite of the previous example. Next, the observer looks through the sight vanes and directs the assistant "onto line". The assistant then sets a *range pole* or stake in line with the direction of the compass at the foresight point. The distance is measured between the two with a chain or tape, and the instrument is then moved forward to the foresight point where the procedure is repeated. This method can result in a curved or crooked line, depending upon local attraction of the needle.

The second method can be further modified by another procedure which will help reduce the error of the needle. The compass is not only attracted to the earth's magnetic pole, but also to other ferrous objects like iron ore deposits. However (and contrary to my early academic teachings) I was once told by another, older surveyor years ago that "nothing will pull a needle like a good stand of timber". That aside, the technique of running a *picket line* will usually improve the results of a compass survey. Once the first course is set, the remaining courses are projected straight in the same physical direction, similar to the appearance of a picket fence. This is accomplished at each successive setup by first aiming the compass towards the backsight point. Next, the observer walks around to the "rear" of the compass, looks through the sight vanes and directs the assistant to place the foresight on a forward projection of the backsight. Curiously, a black line (an optical illusion) appears when sighting the vanes in the reverse position which makes this possible. During this procedure the orientation of the compass does not change after the back-sight is taken. The back and foresight bearings are still recorded, but not used to guide

(continued on page 38)

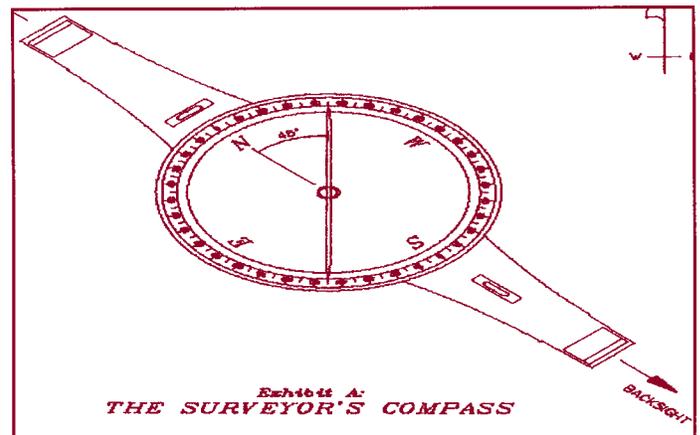


Exhibit A:
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Exhibit A



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The Surveyor's Compass (continued)

the direction of the successive courses. This method yields fairly straight lines. However, if there is much directional error in the initial starting course, the picket or *trial line* can stray considerably from the true line as one approaches the far end of the traverse. Here the *closing error* is measured between the ends of the trial line and the desired true line. This error is then proportioned along the trial line according to the distance of the compass from the initial setup. The proportioned distance *offset* is measured (left or right) to the correct true line. The true line would then hopefully be marked with tree blazes, stones or stakes for others to follow and improve upon.

The compass was lightweight, easy to use and a fast surveying instrument. It was used in Vermont from the time of the early settlements in the last half of the 1700's up until the 1960's and 1970's. It served the early surveyors well as an efficient and useful tool to survey grants, subdivide property and lay out roads. The results could be mapped easily and did not require the use of higher level math to calculate and plot the results.

However, the compass's utility is severely offset by its lack of precision. The measurement error resulting from a typical compass and chain survey can easily exceed 1:100, or one foot of error for each 100 feet of measured distance. Modern efforts to relocate old compass surveys may only result in approximations of the original work. Today's retracement surveys rely heavily upon existing physical evidence to approximate the original courses on the ground. In a sense,

the surviving evidence helps to control the "drift" of the earlier survey. Accurately relocating an old compass survey is difficult to accomplish without that evidence.

The compass was the instrument of choice for almost 200 years in Vermont, particularly on rural boundary surveys. Depending upon locale, it was gradually replaced by the more precise transit from 1950 to 1980. In the 1980's the transit yielded to the theodolite and electronic distance meter. Now surveys are performed with robotic total stations with electronics data collectors, used in conjunction with GPS equipment to achieve exact measurements which would have been unimaginable by the early surveyors.

Despite these advances, every so often it's somehow rewarding to retrieve my Sipe's compass from the closet, set it up and run a few lines. It doesn't read bearing to the nearest second. It doesn't have the buttons to measure distance at the speed of light, nor even a small bulb to illuminate the needle when the November shadows grow long. But it does have history. It bonds. Its use is nostalgic of running lines as years ago and creates an identity with those who first parceled out this land. Its use gives an appreciation for the techniques and accomplishments of the earlier generations. More modern devices will come and go, but the surveyor's compass will always be the instrument which lead the way and played such an important role in this country's development. 

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