Missouri Surveyor

A Quarterly Publication of the
Missouri Society of Professional Surveyors

Jefferson City, Missouri March 2011

MISSOURI SURVEYOR

CALENDAR OF EVENTS

2011-2012

May 5, 2011
Board of Directors Meeting
and Golf Tournament
Lodge of Four Seasons
Lake Ozark, MO

May 6-7, 2011
Spring Workshop
Lodge of Four Seasons
Lake Ozark, MO

July 8-9, 2011
Board Meeting, Golf Tournament
and Minimum Standards Workshop
Lodge of Four Seasons
Lake Ozark, MO

October 13-15, 2011
54th Annual Meeting and Convention
University Plaza Hotel
Springfield, MO

May 11-12, 2012
Spring Workshop
Lodge of Four Seasons
Lake Ozark, MO

July 14, 2012
Minimum Standards Workshop
Lodge of Four Seasons
Lake Ozark, MO

October 11-13, 2012
55th Annual Meeting and Convention
Hilton St. Louis Frontenac
St. Louis, MO

John Alan Holleck, Editor

Notes from the Editor's Desk

by John Alan Holleck

As I write this column, I am sitting at my window looking at the snow that covers my grass. I try to remind myself that this is late February and we can have snow in March. In fact, it snowed 6 inches the first week in March (1975), which was my first week working on a survey crew. We actually went out and set slope stakes on a road construction project during that first week. Sometimes it is hard to believe that this story took place 35 years ago, more or less.

The first major article is "The Impact of Land Surveying on our Nation's History—224 years of the Public Land Survey System" by Bob Abbey, the Director of the BLM. This article is followed by "An Interview with Thomas Jefferson" by Professor Emeritus Gaby Neunzert, PLS, of the Colorado School of Mines. Professor Neunzert invents George P. Smarty (GPS for short) to interview Jefferson in 1784, nineteen years prior to the Louisiana Purchase, although Jefferson was thinking about that land. Up next is the "Surveyor's Library—Review of the 2009 BLM Manual," by Tom Webb, PLS, of Arkansas. Webb offers a detailed assessment of the greatly expanded new Manual. Beginning on the middle page (20) of this issue is an article by our own Ron Kliethermes, PLS, entitled "Surveying Demo part of the Linn Technical College's Mother-Daughter Construction Career Day." Ron and Sharon Herman, PLS, must have had a good time describing surveying to novices.

Chris Wickern, PLS, writes in "Standing on the Shoulders" about a plan to interview some of our older surveyors about their careers and what they are doing now. Chris also calls for volunteers to interview some of the subjects. It sounds like a very good idea. The back half of the *Missouri Surveyor* opens with "Boundaries & Estoppel" by Knud Hermansen and Robert Liimakka. Estoppel is a legal concept that keeps a person from benefiting from his or her own folly. Next follows Steven E. Weible, PLS, who pens an "Analysis of an EDM Baseline Comparison," a treatise for the uninitiated. Next comes a couple of Kansas land surveyors, Norman Bowers, LS and Steven S. Brosemer, LS, offering the reader the idea of a "First Survey as an Original Survey." This concept concerns those parcels that were created without the benefit of a surveyor—such as lots in a closing section. Gary John Bockman, PE, PLS, follows by asking the question "What Do Principles of Land Surveying Really Mean?" Gary addresses a problem he was given by a client that gave him pause for thought. Next are some more thoughts on the Missouri State Fair entitled "Educating the Public at the Missouri State Fair." Wendy Lathrop, LS, CFM, offers her thoughts on "Professionalism, Logic and Law." She discusses what should be part of continuing education. The final article is by another friend of ours, Joseph V. R. Paiva, PhD, LS, PE, "Professional Topography: The True Meaning of Professional," a subject near and dear to his heart. Well, there is another issue in the basket. Happy reading everyone.

THE MISSOURI SURVEYOR

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President's Message

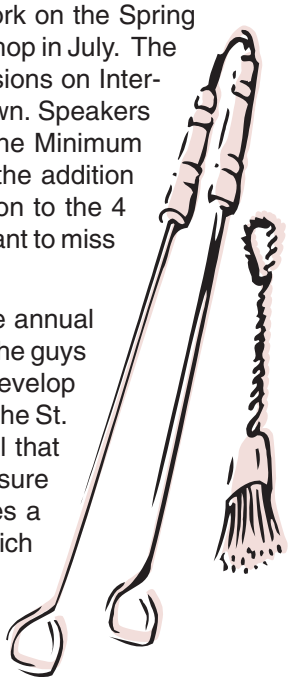
by Mark Nolte, PLS

Greetings.

I write to you on the heels of several meetings with Legislators in Jefferson City to discuss the disposition of the Land Survey Program in Rolla. As I am sure you are well aware, the Program is suffering to stay in business due to the excessive cost allocations made by the Department of Natural Resources upon its coffers. Over the past three weeks, in meetings with legislators and with the assistance of our lobbyist and legislative committee members, a solution may have been found. Within days of the writing of this message, legislation is to be proposed that will remedy our problem. This is good news to us who rely on the Program for all of the functions that they perform. Many hurdles exist between today and resolution. This message is not to say it is a complete deal. The process has only begun. I would encourage you to continue to communicate with your legislative contact regarding all surveying matters.

While in the Capitol, I heard good news regarding the legislation to amend the statute of limitations as well as the lien rights of surveyors. It would seem that both of these issues may move unabated thru the legislative process.

The Education committee has completed their work on the Spring Workshop in May and the Minimum Standards Workshop in July. The May workshop will be on the Missouri GLO with sessions on Interpreting the New BLM Manual and Sectional Breakdown. Speakers will be Jim Mathis, Robert Ross and Bob Shotts. The Minimum Standards Workshop will be different this year with the addition of ALTA standards presented by Gary Kent in addition to the 4 hours on Missouri's minimum standards. You won't want to miss either of these workshops this year.



Lastly, I take this opportunity to update you on the annual meeting "banquet" in Springfield for 2011 in October. The guys down there have been working at a feverish pace to develop a barbecue throw-down that will be hard to one-up by the St. Louis Annual Meeting crowd in 2012. I encourage all that can attend the annual meeting in Springfield to be sure and attend the banquet. My dream is that it becomes a contest of the different regions of the State to see which can become the favorite.

Cover: Ralph Riggs stakes out location for a section corner in a cotton field in southeast Missouri.

The Impact of Land Surveying on our Nation's History — 224 Years of the Public Land Survey System

by Bob Abbey, Director, Bureau of Land Management Reprinted from *California Surveyor,* Spring 2010

This is the keynote address of the CLSA-NALS Conference 2010 in Reno, Nevada. It was presented by Bob Abbey, Director of the BLM, on February 28, 2010. Thanks to Frank Lehmann, PLS, RPF, for coordinating with Mr. Abbey so we could publish this article in the California Surveyor — Editor

This year marks the 224th year of the Public Land Survey System. I have worked in the western United States for a long time, and I know firsthand where the development and conservation of natural resources have competing demands. The Department of the Interior (DOI) manages 500 million acres of surface lands, one-fifth of the land in the United States, as well as a 700 million-acre sub-surface mineral estate. The Department's ability to accurately identify and establish — sometimes re-establish — monuments that document the legal boundaries between public and private lands is critical to our nation's economy and to the integrity of real estate transactions.

As the Director of the Bureau of Land Management (BLM), I'm honored to have the opportunity today to shine the spotlight on the Public Land Survey System and the historic Cadastral Survey Program.

The original thirteen states in our country were based upon division of lands that had been set by the King of England through land grants. These grants had been established from London, where the information on the New World was sparse and inaccurate. Maps were almost nonexistent. After the Revolutionary War with England, the States wanted to resolve their boundaries. More importantly, the States wanted to establish the unclaimed lands of the West — "the Western Reserve" land west of the Appalachian Mountains as public land or "Public Domain lands" for the development of the country.

Long before the Department of the Interior was established, surveyors were hard at work drawing the boundaries of this nation's new frontiers.

Controversy on how the lands were selected and the validity of surveys had long laid the seeds for survey reform in America. The change came in the form of a new design for a rectangular survey system, or the Public Land Survey System. The Continental Congress would debate and finalize this system in 1785. The system would be used for the disposal and sales of the non-original thirteen colony lands, or the Western Reserve Public Domain lands, of the newly formed United States. Most of you are aware of these events, but many people do not realize that the BLM's roots originated before the Constitution was ratified with the Land Ordinance Act of 1785. This act established the "Public Domain Lands" and the system of surveying that you are all familiar with today.

The debates that occurred before the passing of the Land Ordinance Act of 1785 are fascinating and colorful because many of the founding fathers of this country were directly involved with surveying. George Washington's career was based upon his surveying expertise and his association with Lord Fairfax. This early livelihood was extremely important and pivotal to the success of Washington's life. By surveying the raw and unsettled lands of the New World, many windows of opportunity were opened for Washington. Throughout history, land has always equated to power and wealth, and this was amplified in colonial America. Land ownership was the gauge of a person's status, power and wealth in 18th Century America. Only land-owners were allowed to vote, and the size of land ownership was definitely the mark of status. The value of land has only increased today. The status is still there, and the demand on the lands and its uses has only increased at an exponential rate.

Washington realized that to measure, or survey, the land would afford him a great advantage in the "currency" of the New World. His experience in surveying and mapping the lands also provided him with invaluable skills and knowledge during the Revolutionary War. Thomas Jefferson was keenly interested in surveying because his father was a surveyor. Also, Jefferson was appointed as a county surveyor and was influential in the new design of the Public Land Survey System. Roger Sherman, a surveyor from Connecticut, was the only person to sign all four documents establishing this country — "the Articles of Association," "the Declaration of Independence," "the Articles of Confederation" and "the Constitution." Of course, Abraham Lincoln was a surveyor and used the income from surveying the homesteaded lands of Illinois to pay for his education to become a lawyer and eventually one of our Nation's greatest presidents.

Long before the Department of the Interior was established, surveyors were hard at work drawing the boundaries of this nation's new frontiers. The General Land Office (GLO) was created in 1812 as a separate bureau within the Department of Treasury. Most of the Public Domain land was surveyed with oversight by the GLO. These surveys were the first inventory of our nation's natural resources and were the basic tool for systematic development of both private and public lands. By 1910 the GLO employed over 1,400 people. The GLO became a part of the BLM in 1946. Portions of Alaska, Nevada and other western states continue to be surveyed

for the very first time. However, the majority of our survey work is to modernize century-old surveys and boundaries with new survey markers and modem GPS measurements.

The land laws enacted by Congress since 1785 are based upon the Public Land Survey System. Future laws will also be based upon this system. These laws include the management of minerals, water resources and wilderness; almost any activity performed by both the private and governmental sectors. Today, many of our Federal lands are noncontiguous, a patchwork of parcels that require certainty of location — surveys form the foundation of all land management work that the Interior performs in partnership with States, Tribes, counties, municipalities and the private sector.

The Western Governors' Association recognized the importance of cadastral survey information through a resolution that stated:

> *Western Governors urge BLM to complete, enhance, and maintain the Cadastral (system) . . . in support of energy development, forest health restoration, wildland fire management, Homeland Security and First Responders.*

One of the chief tools that the BLM uses to accomplish its work is the Manual of Surveying Instructions (Manual)[1], the standard to which more than 300 government surveyors and 50,000 private surveyors adhere in conducting surveys. Not only Federal, State, county and local surveyors, but also attorneys, solicitors, and the title and real estate industries couldn't do their job without the Manual. The new manual completed under the leadership of Don Buhler and Bob Dahl was officially released on September 24, 2009, at a ceremony at the Department of the Interior in conjunction with the National Society of Professional Surveyors and the American Congress of Surveying and Mapping. Working closely with the Solicitor's Office, the authors updated the Manual to be consistent with current legislation, judicial and administrative decisions, and current surveying practice. When the Manual was last issued in 1973, editors could not have foreseen the modem technology now commonly used in the surveying community. This time, we've tried our best to make the language "technology independent." We also addressed how to survey in Alaska, which is done somewhat differently than in the lower 48.

The four areas of significant change in the new Manual include:

1. Updated content on water boundaries
2. Standard of evidence
3. Coordinates as collateral evidence
4. Mineral survey resurveys.

Americans can be confident that the 2009 edition of the Manual will see us into the future, regardless of what township we may be in.

Last year, the Secretary had the pleasure of recognizing in a brief ceremony 110 BLM cadastral surveyors for their expertise in professionally carrying on the rigors of the Public Land Survey System. This work could not have been done without the support of the private professional surveyors. Because of BLM's cadastral surveyors and the private professional surveying community, we enjoy the benefits of accurate survey and all that comes with that across all jurisdictions and land tenures of our great country. As our population continues to grow, communities expand, and our country's remaining open spaces become more valued, your work as surveyors is even more essential.

Certainly, land surveyors facilitate effective management of some of America's greatest assets — its treasured landscapes and the rich resources found on and under the surface of Federal lands and beyond. For example, the Department depends on accurate legal descriptions in order to deliver a fair return to the American public for the commercial sale and production of the Nation's mineral estate and natural resources. For that matter, we couldn't begin to confidently capture the wind and solar renewable energy resources found on Federal lands without knowing land boundaries and geographical features.

Our cadastral surveys provide the basic certainty that the renewable energy industry requires before they begin the long process and ultimately the huge investments in development of wind, solar and geothermal energy. This team effort will assist our country in breaking our dependence on foreign sources of energy. The Public Land Survey System, which was conceived by our country's founding fathers, will continue to be one of the key components of economic growth, which is based upon our country's vast land resources. We know the surveying sector is impacted by the recession. Our Cadastral Survey Program is involved with the American Recovery and Reinvestment Act for projects of nearly $23 million, resulting in private contracting and job creation. The projects include improving the accuracy of our cadastral information, survey plat and records scanning, GIS work, records improvement and cadastral surveys for identification of abandoned mine lands reclamation projects.

In the last 225 years, surveying tools and techniques have changed. It's impossible to even imagine what the next 200 — even 20 — years will bring us. However, one thing is for sure: our cadastral surveyors and you will continue to execute and maintain this great system of land tenure and ownership. I'm confident that through the rich resources the Department and BLM manage — and with the assistance of surveyors, both BLM and private — the Department's role will continue to be monumental in securing a productive future for our Nation. I thank you for the service you provide.

[1] *The BLM's Surveying Manual of Instructions may be purchased by contacting the American Congress on Surveying & Mapping at www.acsm.net (eStore link).*

Georgia Advocates for Four Year Degree Requirement

The Surveying and Mapping Society of Georgia (SAMSOG), in consultation with engineering colleagues, plans to promote legislation during the 2011 legislative session to institute the requirement of a four year degree as a prerequisite for registration as a Professional Engineer or Registered Land Surveyor in the State of Georgia. This legislation was introduced twice during the Perdue administration, only to suffer a veto from the governor both times.

The need for a requirement for a four year degree has been discussed at great length for many years in Georgia and has been clearly established as an appropriate level of education for those pursuing registration as either a Professional Engineer or Registered Land Surveyor, according to SAMSOG. Tests administered by the NCEES for both professions are now geared for a four year graduate. All states adjoining Georgia now have degree requirements for both professions.

The legislation to be introduced will require a four year degree from any institution approved by the Board of Registration for Professional Engineers and Land Surveyors. Applicants applying to sit for either the LSIT or EIT exams prior to July 1, 2012 would be required to meet the requirements of existing law. Those applicants applying for the LSIT or EIT exams after July 1, 2012, will be required to possess a 4 year degree approved by the State Board of Registration. Applicants applying to sit for either the LS or PE exams prior to July 1, 2014 would comply with existing law. After this date, applicants for either exam would be required to possess a four year degree approved by the State Board of Registration.

NSPS and ALTA Boards Approve 2011 ALTA/ACSM Land Title Survey Standards

The Board of Directors of the National Society of Professional Surveyors approved the new 2011 Minimum Standard Detail Requirements for ALTA/ACSM Land Title Surveys during its meeting in Orlando on November 15th. The new requirements were previously approved by the Board of Governors of the American Land Title Association at its October 13th meeting in San Diego.

The 2011 Minimum Standards represent the latest and 8th version of the Standards which were last revised in 2005. It is also the first major rewrite of the Standards since their initial adoption in 1962. The new Standards will become effective on February 23, 2011, at which time all previous versions will be superseded.

The ALTA/ACSM Standards are nationally recognized by title companies, surveyors, lenders and attorneys as the survey standard to rely upon in conveyances of real property when extended title insurance coverage is required by one or more of the parties.

The final, approved version of the 2011 Standards may be downloaded from the ACSM Web site at www.acsm.net under the “Standards” section, or from the ALTA Web site at www.alta.org/forms under the “Recently Approved for Final Publication” section.

Updates to FEMA’s Guidelines and Specifications for Flood Hazard Mapping Partners Available

The Federal Emergency Management Agency (FEMA) has developed a revised draft for Appendix K: Format and Specifications for Flood Insurance Rate Maps and Appendix L: Guidance for Preparing Digital Data and Flood Insurance Rate Map Databases, which are found in FEMA’s Guidelines and Specifications for Flood Hazard Mapping Partners.

Appendix K describes the updated standards for the graphic elements that are shown on Flood Insurance Rate Maps (FIRMs).

Appendix L provides guidance and specifications for the preparation of preliminary and final FIRM Databases for FEMA.

The revised documents will be available for public review and comment through January 17, 2011. The revised documents and a diary of changes can be obtained via these links:

For appendix K: http://wwwfema.gov/library/viewRecord.do?id=4398

For appendix L: http://wwwfemagov/library/viewRecord.do?id=4399

Written comments and suggestions via track changes or document comments may be submitted to FEMA electronically by sending an e-mail message to: FEMAGS@Riskmapcds.com

Alternatively, comments and suggestions may be mailed to the address below or transmitted by facsimile to the number below. Please send all correspondence to the attention of: Scott McAfee, FEMA Region IX, 1111 Broadway, Oakland, CA 94607, Fax: 510-627-7147.

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 Communitiy 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)

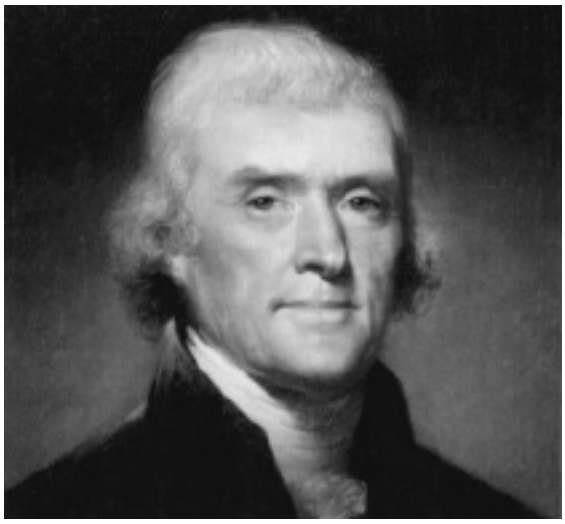
Missouri University of Science and Technology — Rolla, Missouri
Contact: Dr. Richard L. Elgin, PLS, PE
Adjunct Professor
Department of Civil Engineering
1401 North Pine Street
211 Butler-Carlton Hall
Rolla, Missouri 65409-0030
573-364-6362
elgin@mst.edu

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

An Interview with Thomas Jefferson

by Gaby Neunzert, PLS, Professor Emeritus, Colorado School of Mines Reprinted from *Side Shots,* Fall 2010



Portrait of Thomas Jefferson by Rembrandt Peale, 1800.

Prologue

Very few activities in the history of mankind had as direct an influence on individuals as the US Public Land Survey System (PLSS).

In order to understand and follow in the footsteps of our predecessors, this presentation highlights the thought processes and, to some extent, "how did they do it," rather than the instructions of the Manual.

Thomas Jefferson is considered to be the "father" of the GLO surveys, creator of many of the original ideas, to be followed later by scores of deputy and private surveyors whose names are perpetuated in numerous volumes of field notes. Ideas, concepts and equipment evolve slowly over time and with the hindsight of modern times, these beginnings appear to be primitive, yet most modern surveying methods would not exist without these roots of the past. Surveying, by whatever definition, did not advance by itself but relied on many disciplines, most notably mathematics (plane and three-dimensional) as well as celestial navigation for latitude, longitude and GPS. The timing of many events is vague at best, usually within a 10 year or longer timeframe, unless tied to some legislative action or a specific written document.

The following is a hypothetical interview with the third president of the United States, Thomas Jefferson, with the questions coming from a hypothetical, present-day surveyor with a strong curiosity of how Jefferson would answer his questions. My goal is to illustrate the thinking at the time that led to the creation and later the implementation of the PLSS.

Editorial note: In the narrative below, the broad historical pictures are factual, smaller details have been added to supplement the presentation.

Cast of Characters:

THOMAS JEFFERSON (1743–1826) Chairman of committee dealing with measurements and western lands; Minister to France 1785–89; Secretary of State 1789–93, 1793 French Academy of Science defined the metre; President of US 1801–1809

GEORGE P. SMARTY (DOB: February 22, 1978) Professional Surveyor

The Interview:

Following below is an interview between Thomas Jefferson in late 1784, just prior to his departure to France, and George P. Smarty, as spokesman for the "modern" surveyors.

G.P.S.: Good morning Mr. Jefferson, how do you feel on the eve of your departure to France with their novel ideas about metric units?

T.J.: As already demonstrated with the dollar, decimal units are the wave of the future and we should survey the western lands into blocks of 10 sections each. In turn, the subdivision should be into fractions of 10.

G.P.S.: As chairman of the committee of dealing with western lands, what should we do to survey this land?

T.J.: It is obvious that we cannot extend the metes and bounds surveys of the east coast in an orderly fashion to the west. We need to have a survey system which is easy to understand by both surveyors and lay people and which can be laid out quickly and efficiently. It also should be possible to start these surveys from many different places. Maybe a checkerboard pattern would be the answer.

G.P.S.: Well, how much unsurveyed land do you think there is?

T.J.: We have no idea. At present the land stretches from the Gulf of Mexico to the 49th parallel, the border with the British Dominion of Canada, and from the Appalachian Mountains to the Mississippi River. Ultimately I could even envision our country stretching all the way to the South Sea (Pacific Ocean) on the west.

We don't even know the location of the Spanish missions in San Diego (est. 1697) or San Francisco (est. 1776). Based on some very inaccurate maps, the area covered is very roughly 2,000 miles E-W and roughly 1,200 miles N-S; in all probably about 2,000,000 sq.mi. (modern value about 2,343,000 sq.mi.)

G.P.S.: Why is it so important for the government to survey the land?

T.J.: In the past only the sovereign classes owned land and the farmers worked it as tenants. Now, it has become possible

for every private person to own land outright and realize the American dream. Treating the land as a commodity made it possible to buy, trade and sell land by the government and private citizens alike. The government has a crushing debt from the War of Independence, which could be reduced by the sale of land, and there are also many war veterans who would like to redeem their "scrip" for land. Without an orderly way to survey and easily describe the land and then file and record the deed at a courthouse, there would be chaos and the possibility of corruption.

G.P.S.: Mr. Jefferson, did you realize that when you first proposed it in 1776, the Northwest Ordinances of 1876 and 1879 would lay out the pattern for creating new states, and as a condition of joining the union would "force" the original member states to cede their lands west of the Appalachians to the central government?

T.J.: Yes, those ordinances were necessary for two reasons; first, without the power of taxation and with the enormous debt accumulated from the War of Independence, selling land by the National Government was virtually the only source of revenue and second, by making all future member states about the same area would help balance their apparent power in Congress.

G.P.S.: A checkerboard pattern; how would this be laid or surveyed out?

T.J.: It all could start with a stake driven into the ground at strategic places across the country, to be called a "principal point". From this principal point a true north-south line called a meridian would be surveyed and then an east-west line, to be called a "baseline", would pass at 902 to the meridian. Next, the layout of the squares would have to be in three ever smaller steps; first the largest squares, say maybe 30x30 miles (later 24x24 miles), then inside them 10x10 miles (later 6x6 miles) and finally inside each of them 1x1 mile squares. Inside this framework, for example, a farmer could have his land surveyed and uniquely described within less than 1 mile from an "official" monument.

G.P.S.: How could one identify land in this checkerboard pattern?

T.J.: First, each starting point (principal point) should have a name, for example: 6th Principal Meridian, Mt. Diablo, etc. Then starting at the principal point and in 10 mile (later 6 mile) steps would be "Range" blocks, counting 1 east, 2 east, etc. or 1 west, 2 west, etc. Likewise "Townships", in 10 mile (later 6 mile) steps, would be designated in steps of 1 north, 2 north or 1 south, 2 south, etc.

G.P.S.: Yes, this is great, but the way you have just described it, the land is now broken up into 10x10 mile (later 6x6 mi.) squares, maybe confusingly called "townships." What good would that do to, say, a farmer?

T.J.: Well, as the name implies, a town could be built at the center of each "township" and a farmer could easily drive his horse and buggy into town and back again without missing any farming chores, and farming kids could walk to school. But for an individual farming, the township is too large and must be broken down further, say into 1x1 miles squares, to be called 11 sections", or even further into aliquote (fractional) parts.

G.P.S.: With no money or even a national treasury, how could local schools be financed within a township?

T.J.: With an abundance of Federal land, schools initially could be financed by selling one or two sections (1 or 2 square miles) dedicated within each township of land. Especially in areas with natural resources, adding the mineral rights to the surface land deed in the "school sections" would provide much needed operating revenue for the schools and mining related colleges.

G.P.S.: How will you now measure distances to lay out the rectangular pattern?

T.J.: Especially since there are no metric chains, we will have to revert back to the Gunter chain of 66.00 ft in length. By starting with a mile of 5280 ft. and 66 ft./chain, this makes 80 chains to a mile, 40 chains for a half mile, etc.; actually fairly easy since it includes the old English system of dividing by 2 or 4. In turn, Edmund Gunter (1581–1626) incorporated the decimal system, by dividing his chain into 100 links of 0.66 ft each. Areas work out also by multiplying the length and width in chains and dividing by 10 to get acres.

For example:
an area of 2 chain wide and 5 chains long = (2 x 5)/10 = 1 Acre;

an area of 4 chain wide and 2.5 chains long = (4 x 2.5)/10 = 1 Acre;

a square, 5 chains on each side = (5 x 5)/10 = 2.5 Acres;

10 chains on each side = (10 x 10)/10 = 10 Acres;

40 chains on each side = (40 x 40)/10 = 160 Acres, etc.;

G.P.S.: How about the positional accuracy of all the many thousands of monuments initially surveyed with Gunter chains and magnetic compasses?

T.J.: The position of the original monument controls. Thus by definition and law the location of each original monument is deemed to be correct, a resurvey with more modern methods can only provide more accurate numbers but cannot change the location of the monument. It is also imperative that the government surveyors establish the most permanent monuments possible during their initial surveys. Yes, there will be defective surveys and then the government can make either a dependent or an independent resurvey.

(continued on page 12)

An Interview with Thomas Jefferson (continued)

G.P.S.: This brings me to the question of direction. As originally conceived, the borders of the "squares" were to be surveyed either north-south or east-west. How was this to be done?

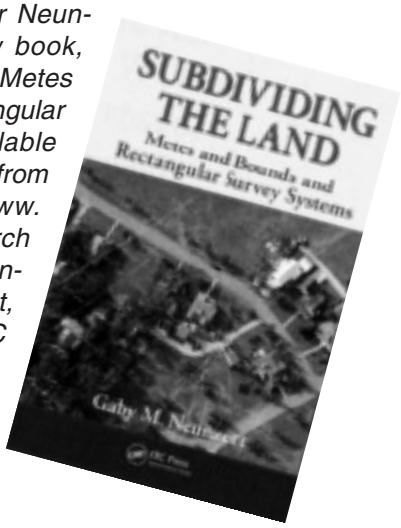
T.J.: Just as with ocean navigation, the magnetic compass can be used.

G.P.S.: But Mr. Jefferson, the magnetic compass varies from the true direction by the declination and is subject the magnetic influences form the ground, etc.

T.J: Point well taken. When in doubt, the surveyors will probably have to observe the stars or the sun in order to establish geographic directions, but at the present this will not be possible in the field.

This concludes the first interview, undoubtedly to be followed by other notables from within the surveying profession. Interested reader may possibly suggest topics and participants in order to broaden the presentation.

Editor's Note: Professor Neunzert has written a new book, "Subdividing the Land: Metes and Bounds and Rectangular Survey Systems," available after November 2, 2010. from the publisher; visit www.crcpress.com and search for the title. Or, for an introductory 20% discount, write to Di Askew, PLSC Executive Director at Diana. askew@plsc. net for an order form. Congratulations, Gaby!



Surveyor's Library – Review of the 2009 BLM Manual

by Tom Webb, PS Reprinted from *Point of Intersection,* Arkansas, Fall 2010

[NOTE: Numbers in brackets are references to the quoted section of the 2009 Manual. All emphasis has been added by the reviewer.]

The 2009 edition of the Bureau of Land Management (BLM) Manual of Surveying Instructions is the latest in a long line of official instructions for surveyors engaged in the execution of official federal surveys. An official federal cadastral survey is "the highest form of boundary evidence available to the Federal Government, providing legal evidence of the geographic limits of the Federal interest in land." [1-5]

The differences from the 1973 Manual are considerable, starting with the price — $125. This Manual has half again as many pages as its predecessor, glossy paper, and multicolor illustrations. While the '73 Manual had a sprinkling of citations to court decisions; the list of cases in the new manual covers two pages of the index and legal issues are as significant a theme as surveying technique.

The instructions have been changed in significant ways, but the procedural core remains unchanged. Several significant issues centering around the degree of influence the Manual should exert on private surveyors retracing Public Land Survey System (PLSS) boundaries for private clients remain and to this writer are not clearly resolved by the new manual.

The BLM points to four significant changes in the new manual:

1. The standard of evidence required to accept a corner as obliterated has changed from "beyond a reasonable doubt" to "substantial evidence." This fundamentally changes the evaluation of corner evidence. The 2009 manual has a new Chapter 6, "Resurveys and Evidence" that expands the discussion of corner evidence.
2. In Chapter 2, "Surveying Methods," "repeatable coordinates" are identified as possible "collateral evidence of a corner position" that in some cases "may constitute substantial evidence of the position of an obliterated corner." [2-34] This statement is followed by a brief exposition of some factors limiting the "repeatability" of coordinate positions. Interestingly, coordinates are not included in the lengthy discussion of collateral evidence in Chapter 6.
3. A 42-page chapter, "Resurveys and Water Boundaries" has been added with extensive discussion of the legal issues of water law with very good diagrams and maps. Three cases touching on Arkansas water boundaries are included two concerning the Arkansas River and one about a fraudulent two-square-mile lake conjured up by a deputy surveyor in Northeast Arkansas.
4. Instructions for Mineral Surveys have been expanded.

On the first page of the Manual, the BLM announces that the policy supported by the instructions has changed from "one favoring disposal and settling of the unreserved public lands to one favoring retention, administration, and control." In other words, the days of the land sales rush are over, from now on the steady duty to maintain the existing Federal boundaries will predominate. Chapter 2, "Methods of Survey" has shrunk from 46 pages in the 1973 Manual to 12 pages. The overall emphasis of the instructions has shifted from original surveys to resurveys.

The Manual is explicitly designed to direct official surveys of the boundaries of "Federal Interest Lands." The perennial question arising from this Manual as with previous ones is the extent to which the surveyor engaged in determining P.L.S.S. boundaries for private clients should be guided by it. This Manual raises the obverse question: To what extent should Federal surveys accept the work of private surveys as evidence for the determination of corners and boundary lines? This review focuses on this debate in the context of Chapters 5 and 6, "Principles of Resurveys" and "Resurveys and Evidence," of the 2009 Manual and as it applies to survey practice in Arkansas.

Obviously, the BLM instructions are mandatory for surveys and resurveys upon U.S. government lands. The manual states that the boundary between Federal interest land and private land must be governed by the rules in the Manual, because these procedures implement Federal statutory law as to

the re-establishment of the corners and lines of the original surveys. The "original survey" is, of course, the government survey represented on the General Land Office (GLO) plat which was the basis of the sale and patent of the land from the U.S. government to the entryman. It is equally obvious that where both sides of a boundary have passed into private ownership "final determination in the matter of fixing the position of disputed land boundaries rests with the local courts." [5-18] However, the statute law or regulations of some States requires the use of the BLM manual in the location of all P.L.S.S. boundaries.

Where Federal interest and private ownerships adjoin, there is a real possibility of disagreement between the retracement surveys of each interest. The Federal survey and the private survey should both respect the public interest in the stability of boundaries. However, the Manual points out that Federal Statute law protects that interest in a very different way than the Common Law used in State courts:

> *Stability of boundaries in the non-federal arena is often given as a guiding principle behind boundary resolution theories such as adverse possession or acquiescence. The Federal statutory scheme . . . does not seek to reward a land owner who merely maintains an enclosure or improvement for a long period of time . . . stability is inherent in protecting the lines run and marked in an official survey . . . all evidence gathered, whether direct or collateral [should] be analyzed with a view toward discovering the best evidence of the official survey lines. [6-2]*

This language seems to say that evidence of long possession and use cannot be determinative of P.L.S.S. corner and boundary location. However, the new Manual goes very far in opening the door to including such evidence in the boundary evaluation. The purpose of any resurvey, of government or private lands is "protection of existing rights acquired under the original survey in the matter of location on the earth's surface." [5-25] The 2009 instructions early on advise the government surveyor to consider "local surveys," non-official (private) surveys of P.L.S.S. boundaries, because the evidence provided may serve to protect "bona fide rights as to location in good faith reliance on evidence of the original survey." [5-4] The BLM acknowledges that such local surveys "may provide the best available evidence of the original survey." [5-7]

Taking a GPS observation on a U.S. Forest Service monument near Treat, AR.

The Manual sets out a number of paths by which local surveys and possession evidence may become "reliable collateral evidence of the original surveyed and protracted lines and corners, particularly where those surveys were followed by use and occupancy by the land owners" [6-6]:

- The local survey was based on original monuments prior to their destruction. [6-6]
- The "Good Faith Location Rule" applies where an entryman has located his boundaries "as might be expected by the exercise of ordinary intelligence under existing conditions." [6-35] Verification of "Good Faith Location" may include analysis of "monuments of unknown origin," improvements including fencing," "pipes or stones commonly used at the time." [6-36]
- The survey "marked the corners of legal subdivisions according to the prevailing law using the accuracy standards for the time and locale. [6-6]
- The "Satisfactory Local Conditions" Rule envisions yielding to improvements such as "roads, fences, and other evidence of use" where their position does not differ significantly from where an analysis (perhaps a section breakdown using proportional measure would be useful?) places the original subdivision lines. However, "something is needed in support of these locations. This will come from whatever intervening record there may be, the testimony of individuals who may be acquainted with the facts, and coupling of these things to the original survey." [6-41]
- Acceptance as "Local Points of Control" of "duly qualified and locally recognized points of control . . . where locally accepted lines are in substantial agreement with evidence of the original survey, although without testimony or record evidence relating to the original survey." The "class of evidence forming the basis" for identification of such a point includes: "recorded monuments established by local surveyors and duly agreed upon by interested property owners . . . boundary fences determined in the same manner; and the lines of public roads, drainage and irrigation ditches, and timber cutting lines; when intended to be located with reference to the original subdivisional lines." [6-46] "Monuments of unknown origin must be judged on their own merits, but these monuments should never be rejected out of hand without careful study." [6-48] The manual cautions that "there is no legal authority to disregard the identified evidence of the original survey or to accept a fraudulent or grossly erroneous local corner position." [6-55]

(continued on page 16)

The Manual discusses direct evidence of the corners of the original survey — testimony of individuals, topographic calls from the field notes, corner accessories, witness corners, and line trees, in language very similar to that of the 1973 Manual. Paragraphs [6-19] through [6-29].

The purpose of the evidence identified in a resurvey is to locate the corners of the original survey. Based on the best available evidence a corner is identified as either existent, obliterated, or lost. Existent or obliterated corners can be placed in their original position using the evidence. Lost corners must be positioned using proportional measure from related corners because there is insufficient evidence to determine their position in the original survey. The 2009 manual has significantly reworked the evidentiary requirements for the three types of recovered corners. Now the treatment of lost corners is separated from the discussion of existent and obliterated corners and placed in Chapter 7, "Resurveys and Restoration." The expanded and well-diagramed exposition of the methods of proportional measure is also found in Chapter 7.

"An **existent corner** is one whose original position can be identified by substantial evidence of the monument or its accessories." [6-11]. This is not a significant change from the standard set out in the '73 Manual.

"An **obliterated corner** is an existent corner where, at the corner's original position, there are no remaining traces of the monument or its accessories but whose position has been perpetuated, or the point for which may be *recovered by substantial evidence* from the acts or reliable testimony of the interested land owners, competent surveyors, other qualified local authorities, or witnesses, or by some acceptable record evidence. An obliterated corner position can be proven by substantial direct or collateral evidence." [6-17] Thus, the entire panoply of collateral evidence set out above is available to the surveyor seeking to re-establish the position of an obliterated corner.

Compare this with the parsimonious definition of an obliterated corner in the 1973 Manual: "one at whose point there are no remaining traces of the monument or its accessories, but whose location has been perpetuated, or the point for which may be *recovered beyond reasonable doubt* by the acts and testimony of interested land owners, competent surveyors, other qualified local authorities, or witnesses, or by some acceptable record evidence." [5-9, 1973]

As Jeffery Lucas pointed out in the December 2009 issue of *Point of Beginning* magazine, it was not possible for the prosecution to convict O.J. Simpson under the "beyond reasonable doubt" standard of proof. In both Manuals, the above text on obliterated corners is followed by a qualification: "A position that depends upon the *use of collateral evidence can be accepted only as duly supported*, generally through proper relation to known corners, and agreement with the field notes regarding distances to natural objects, stream crossings, line trees, and off-line tree blazes, etc. or *unquestionable testimony*." [5-9, 1973] Note that the 2009 Manual reads "*reliable testimony*." It is clear that an item of collateral evidence can not in isolation constitute substantial evidence.

The **lost corner** is now an estranged stepchild not to be thought of unless "every means of identifying the original position of a corner has been exhausted." [7-1] It is one whose original position *cannot be determined by substantial evidence*, either from traces of the original marks or from acceptable evidence or reliable testimony that bears upon the original position, and whose location can be restored only by reference to one or more interdependent corners." [7-2] It is tempting to say that a local surveyor would have to be unlucky, lazy, and unimaginative to find themselves stuck with this wall flower very often. However, the surveyor must have a clear vision of the shades of difference between collateral and substantial evidence in evaluating the position of a corner or line.

Substantial evidence is "such relevant evidence as a reasonable mind might accept as adequate to support a conclusion . . . more than a scintilla, but less than a preponderance." [6-11] In Latin "scintilla" means a spark or a mere flicker of light in the darkness. Collateral evidence can constitute substantial evidence when it is *relevant* to the original survey and its collective mass is sufficient to kindle a glow that illuminates the situation.

The final question is the extent to which this new BLM Manual "shall be used by Arkansas professional surveyors as a guide for the restoration of lost or obliterated corners and subdivision of sections." [Ark. Standards of Practice 3.1.B]. The 2009 Manual states that "the Director cannot assume jurisdiction over or responsibility for the acts or results of surveys made by county, local, or private surveyors, or by surveyors . . . employed by other branches of the Federal Government . . . . On the other hand . . . local surveyors as well as cadastral surveyors of the BLM are constantly called upon to search for existing evidence of original monuments, and in this work the surveyors should be guided by the same general methods." [6-4]

Arkansas, unlike its neighbors Missouri and Oklahoma, does not have a statutory scheme of rules to guide surveyors in resurveys. Without the Manual, what is our guide? The magisterial text by Elgin and Knowles, **Legal Principles of Boundary Location for Arkansas** deals with this question:

> *Most of the questions that surveyors have about resurveys of the land system and the subdivision of sections . . . are not addressed in the Arkansas Supreme court decisions. Only a few legal principles concerning these subjects can be derived from the limited number of cases. The supposition that surveyors have been following the restoration and resurvey procedures published by the GLO and BLM since 1883 is generally not true . . . . Fortunately the courts have recognized the procedures that were adverse to BLM methods and in by far the majority of the cases they have decided in favor of and reaffirmed BLM procedures... When the court has before it two conflicting surveys, one performed using BLM methods and the other not*

following BLM methods, it has, with only one possible exception, upheld the survey that followed BLM procedures. Although the court has stated that these BLM procedures are "advisory only," it certainly has closely followed and upheld [them]. It does not take a very astute surveyor to positively conclude that BLM procedures should be followed when performing resurveys of the U.S. Public Land System. [pages 86 and 121]

So the Manual seems to be a safe and useful guide, but for all its liberality in accepting evidence, the 2009 Manual again and again comes back to a bedrock principle: "The position of a tract of land, described by legal subdivisions, is *absolutely fixed by the original corners* and other evidences of the original survey and not by occupation and improvements unrelated to the original survey or by lines of a resurvey that do not *follow the original as faithfully as possible* for the time." [5-29] Evidence not related to the location of the original lines and corners lacking any other relevant support *fail* to support a position.

At this point the unpleasant reality about the original surveys in this state becomes relevant. These surveys drew to a close over 150 years ago — direct evidence of the original surveys is not commonly found in the populated areas of the state. Furthermore, for more than half of the 40-year duration of the original surveys in Arkansas, the office of Surveyor General was controlled by a syndicate of corrupt politicians more concerned with providing their large families and retainers with no-show surveying contracts and plundering federal funds than with actually performing surveys. Finally, the 20-year period immediately following the completion of the original surveys was one of civil war, disorder, and dislocation during which the normal operations of state and county government and land tenure itself were continually disrupted. As a result, reliable record evidence directly connected to the original surveys is rare. Those original surveys that were faithfully completed were guided by Tiffin's instructions — quite different from the scheme found in the 2009 BLM Manual. A thorough familiarity with Commissioner Tiffin's preferences is at least as important as knowledge of the BLM's scruples in 2009.

The Manual makes some acknowledgement that direct evidence of the original surveys can disappear over time or may never have existed: "Where the evidence of the original survey is so obliterated that lack of good faith in location cannot be charged against the entryman, whose claim boundaries may differ from a theoretical location determined by more rigid surveying rules and principles, the available collateral evidence is to be regarded as the best indication of the original position of the claim included in the original description." [6-63] But as is usual when surveyors find themselves in such technical thickets, the best guidance is to work hard and apply your best professional judgment where you find yourself:

"The surveyor should neither rigidly apply the rules for restoration of lost corners or the rules for subdivision of sections without regard to effect on location of improvements nor accept the position of improvements without question regardless of their relation or irrelation to existing evidence of the original survey . . . . The solution to the problem must be *found on the ground* by the surveyor. The responsibility to resolve the question of good faith as to location rests primarily upon the *surveyor's judgment*." [6-37] Corner positioning by proportional measurement can be perpetrated by a licensed surveyor safely immured behind his computer screen — it can and is done without a visit to the field with the use of an unequivocal formula. However, the real rule is that the valid and valuable boundary determination is made by the professional surveyor who has scoured the ground and the record and then struggled amid uncertainty to make the best judgment.

Fighting 9-to-5 Fat

Heart disease. Diabetes. Cancer. There are many health consequences for having a poor diet and no exercise. There may also be professional consequences, however, according to the results of a recent study, published last fall in the Journal of Occupational & Environmental Medicine. Pizza and television aren't just clogging your arteries, it found. They might also be clogging your career. Between 2005 and 2009, Dutch researcher Alex Burdorf and his team surveyed more than 10,600 people who worked for 49 different companies in the Netherlands, asking participants about both their lifestyle and their work habits. The results:

- Fifty-six percent of workers had taken off at least one day in the preceding year because of poor health.
- Being obese, smoking, and having poor diet and exercise habits were contributing factors in more than 10 percent of sick leave occurrences.
- Obese workers were 66 percent more likely than normal-weight employees to call in sick for 10 to 24 days, and 55 percent more likely to take time off for 25 days or more.
- Forty-four percent of workers felt they'd performed less than optimally the prior day, and nearly 4 percent of them were found to eat less than the recommended amount of fruits and vegetables.

"More than 10 percent of sick leave and the higher levels of productivity loss at work may be attributed to lifestyle behaviors and obesity," Burdorf says, adding that employers who encourage healthy lifestyles and take steps to enable them may benefit from increased productivity. "Primary interventions on lifestyle may have a noticeable contribution to maintaining a productive workforce."

Schemmer Equipment Stolen

Schemmer Associates Inc. recently had their Omaha office burglarized. Be on the lookout for anyone trying to sell the following equipment:

- Several Dell laptop computers
- Trimble TSC2 data collector with radio for a robotic instrument, serial number SSAUC53930
- Trimble TSC2 data collector with GPS, serial number SS51C11462
- 2006 Dodge 2500, silver with Schemmer logo on the side
- Incidental equipment such as tripods, prisms, rods, a Wild level, hand tools, etc.

If you have information, please contact Mark W. Frederickson, RLS, at mfredrickson@schemmer.com

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Surveying Demo Part of Linn State's Mother-Daughter Construction Career Day

by Ron Kliethermes, PLS

Linn State Technical College hosted a career day for fifth, sixth and seventh grade girls and their moms on Saturday, November 6, 2010, on the campus of LSTC in Linn, Missouri. Organized by Diane Heckemeyer, P.E., Department Chair of Construction and Civil Technology, and sponsored by the National Association of Women in Construction, the day's goal was to provide a learning experience for young ladies who have reached the age when they need to begin learning about and considering their future career options.

Daughters and their moms learn what surveyors do from hands-on operation of surveying instruments and interaction with professional surveyor volunteers at a Women in Construction career day at Linn State Technical College. (Photo courtesy of The Builders Association.)

Ms. Heckemeyer contacted Sandra Boeckman at the Missouri Society of Professional Surveyors asking for volunteers from MSPS to provide a construction-related surveying demonstration. Sandra sent out an email to the membership — and (who else but) Sharon Herman, current Vice President of MSPS, came forward to spearhead this public relations and education effort. In addition to the demonstration, Sharon and others would speak during the opening welcome session and the after-event luncheon regarding her education and experiences as a surveyor.

This writer volunteered to assist Sharon, as I just happen to live somewhat near Linn State, (Linn is my boyhood home), and my employer would provide several pieces of equipment for the surveying demonstration. I also knew that this would be fun, since I had enjoyed similar events at the State Fair, and when I was able to instruct a couple of Surveying Fundamentals courses at LSTC a few years back.

Sharon and I discussed what kinds of construction surveying activities we could do that might be interesting to young ladies from 11 to 13 years of age. After reviewing the event schedule, we knew that we would have about forty minutes with each group of young ladies and their moms — not much time, but enough to spark interest, describe and show what surveyors do, outline the science and math needed to learn to be a surveyor, and answer any other questions. We decided on this scenario: a national fast-food chain had purchased property next to the campus, and they needed a topographical survey for design and construction of a new restaurant to serve the growing student population there at Linn State Technical College.

> ***There are plenty of young folks out there that would make good surveyors — they just don't know it yet.***

Sharon first explained the "project" to each group, then we had the girls find the property markers by using tapes and metal locators. Next they verified the property markers' positions by operating total stations and data collectors. We explained how the survey instruments work, and described the different kinds of surveys — not just for construction. (I've never had anyone decline the opportunity when I asked them to "take a look through this telescope," or to "push this button to measure to that rod.")

We also held contests to guess the distance from where we were set up to another prism rod we had set far across campus from our topo site. Several of the young ladies logically compared the measurements they had just made at the topo site with the unknown distance they observed to that far-off rod — and several guessed to within a few feet of the correct distance. There are plenty of young folks out there that would make good surveyors — they just don't know it yet.

A couple of moms said, now that they have seen and understand some of the kinds of work that surveyors do, they are interested in pursuing a new career in surveying.

Standing on the Shoulders

by Chris Wickern, PLS

The practice of surveying drastically changed during the period from 1954 through 1980, more so than any other period in our state's history. A mandatory licensing requirement; formation of the State Society; the state Land Survey Program was conceived and created, and our state statutes were changed to conform to federal instructions concerning the subdivision of the PLSS. These are just a few of the significant changes in the last 50 years.

This is hoped to be a series of articles by many surveyors in every corner of our great State of Missouri. The purpose is to acknowledge the numerous and significant contributions our mentors and predecessors made. These contributions changed the face of surveying, more so than any other time in our history, and it is important that their stories be preserved.

Practicing surveyors today understand the results of these efforts. The results affect the daily practice of all, yet, do we understand why these many and significant changes took place? Why after nearly 140 years of an accepted standard of daily practice change to a licensing requirement was enacted? Why were minimum standards created? If we as practitioners today truly want to understand and follow their footsteps, we need to know why they sought these changes and how they sought them. Not surprisingly, not all surveyors were *for* change. Getting the community of surveyors to agree and move forward was and is a monumental task, and I'm sure they never got *all* surveyors to agree with the changes they made. The stories of those opposed to the changes are just as important to our history and need to be preserved as well. After all, to fully comprehend the results of the changes, we need to understand the full extent of their efforts.

We all admire certain surveyors we have worked with or followed. Think about it — Bob Myers, Norman Brown, Jerry Day, Jim Reed, Mort Ratliff, Dr. Dick Elgin, Rich Barr — the list is long, and those mentioned just scratch the surface of the articles needed. Talk to them, pick up a pencil, put some words into the computer, make a document, and tell their stories.

Tip: No surveyor likes surprises. Make a list of questions, and get it to them before the interview. You will be surprised by the amount of information they dig out of their personal records, and how complete the answers to the questions will be.

Linn State's Mother-Daughter Career Day (continued)

In addition to the construction-related surveying demo that Sharon and I put on, Linn State instructors and students provided other hands-on activities such as working with construction materials like concrete and metals, operating mini excavators, learning "how to" in a heavy equipment operations simulator, using other types of construction tools, and a short course on how to read plans. I'm sure that the other volunteers enjoyed the day as much as did Sharon, I and all the attendees.

At the post-event luncheon, the girls and their moms filled out evaluation forms. This provided the planners and volunteers with feedback and comments for future reference and planning. When asked, "What did you learn about construction today?" one young lady replied, "How to drive an excavator;" another: "Surveying, plans reading and driving excavator;" and another: "You can do anything." (This reporter admits that most activities would find it difficult to compete with "driving an excavator.") Some moms responded that they learned "how diverse career opportunities are;" another: "What surveyors do," and "Surveying info was great — school is top notch." All of the comments about this career day were positive. The only real negative was that some wished more time had been allotted for the demonstrations.

These girls and their moms came to Linn State Technical College this sunny Saturday to learn about the many and varied kinds of careers that are associated with the construction industry. We surveyors know that our services are an integral part of every phase of land development — from property acquisition, to planning and design, to construction, and many times post-construction mapping work for facilities/infrastructure management.

Your society was pleased to have been considered and asked to be a part of the day's activities. MSPS urges every member to be active in public education events in your area when these opportunities to make a difference present themselves. These events do not happen often enough — and we wouldn't want you to miss out on the fun.

Sponsors for the event included (alphabetically):
Associated General Contractors/The Builders Association
Caterpillar/Dean Machinery
Missouri DNR — Land Survey Office
Missouri Dept. of Transportation
Missouri Society of Professional Surveyors
National Center for Construction Education & Research
Roy Scheperle Construction

For more information about Linn State Technical College, go to www.linnstate.edu

Boundaries & Estoppel

By Knud E. Hermansen & Robert Liimakka Reprinted from *Random Lines* (Land Surveyors of Iowa) February 2010 (As seen in Nebraska Surveyor, Summer 2010)

Surveyors should be familiar with the doctrine of estoppel. The doctrine of estoppel may locate the ownership boundary in a location that differs from the record boundary.

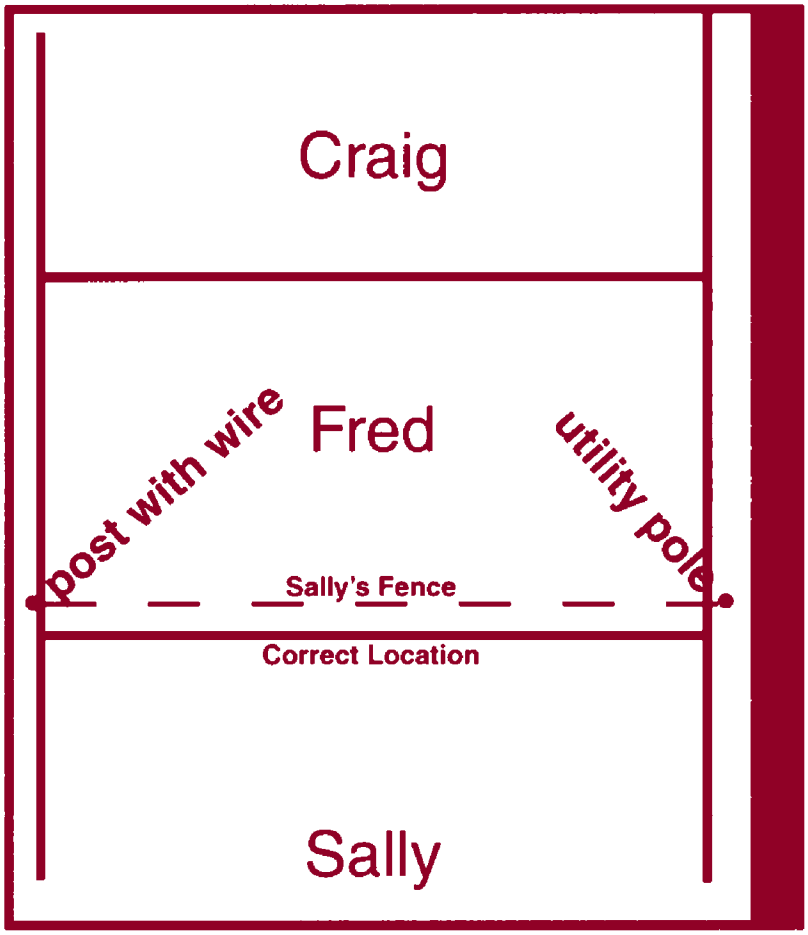
Estoppel is a doctrine that puts into practice the ancient equity: "One who seeks equity must come with clean hands." Put in other words, a person cannot expect favorable relief in the courtroom when they have caused their own problem.

Estoppel arises when one individual misleads another individual; causing reasonable and foreseeable reliance by the misled individual; so the misled individual makes expenditures or takes action contrary to what a reasonable person would do, would the truth be known; and the misled individual will be injured or damaged to their detriment if the court acted in favor of the person who misled the other. The misleading actions may occur by declarations, acts, omissions, words, actions, conduct, or admissions.

Estoppel has a wide reach in all litigation including the litigation of boundaries. A scenario where estoppel could fix the location of a boundary in a location that differs from the record boundary would be the following:

> Sally plans to build a beautiful wood fence on her common boundary with Fred. (Fred is a friendly neighbor but too inquisitive.) When the fence material is delivered, Fred, the neighbor, ever curious about neighborhood activities, comes over to find out from Sally what she is going to build. Sally explains she is going to build a fence on their common boundary but has to wait to begin construction until she can hire a surveyor to locate the boundary. After hearing the reason for the delay, Fred announces there is no need for a surveyor, he can show Sally exactly where their common boundary is located. Fred assures Sally that he asked the realtor about the boundaries before buying his property and the realtor showed Fred the boundary location when he purchased his property.
>
> In the front of the property at the road, Fred shows Sally a utility pole and says this pole marks their front corner. In the rear of their lots, Fred shows Sally a post with old wire fence hanging on it. Fred assures Sally that these objects mark the corners to their common boundary. Furthermore, he even got a copy of the tax map one day and checked the distances between these objects and other corners. He compared the distances on the tax map and his pedometer and they matched.
>
> Sally is very grateful to Fred and builds the fence on a straight line between the objects Fred has shown Sally. Three years later, Fred becomes embroiled in a boundary dispute with his other neighbor, Craig. Fred obtains a survey. The surveyor informs Fred that Craig is correct in his assertion. The surveyor also informs Fred that Sally's fence resides four feet on his property. Fred demands that Sally move the fence to the correct boundary location.

As seen from the previous scenario, Fred misled Sally by his assertions to Sally regarding the common corner locations. Sally reacted to Fred's assertions in a manner that was both expected and reasonable given Sally's discussion with Fred and Fred's positive assertions. Sally spent considerable money putting the fence where Fred had indicated the common boundary was located. She would not have done so had she known the true location. Now Sally faces the



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Boundaries & Estoppel (continued)

prospect of considerable expense if Fred could force her to move the fence to the correct boundary location. Sally has a good claim that the fence should now be recognized as the common ownership boundary based on the doctrine of estoppel. (In this scenario, the court could also demand that Fred pay for the relocation of the fence if he does not want to lose the use of his property cut off by the fence.)

A surveyor who is not familiar with the doctrine of estoppel may have advised the client that since the fence had only existed for three years, the removal of the fence could be required by the court. (The surveyor assumed a more lengthy time period is necessary to meet the requirements of adverse possession in order to fix a boundary in a different location than the location fixed by the records.)

Familiarity with the doctrine of estoppel should cause a surveyor to be timid when making pronouncements regarding the effect of an encroachment on the boundary location even if the improvement has only a short history. As the scenario reveals, elements of estoppel are often proven with information that is not ordinarily gathered by surveyors or even available to surveyors during the course of providing surveying services.

The surveyor would be wise to focus on locating the record boundary and recognize that occupation boundaries may often become the ownership boundary under certain doctrines. Surveyors that opt to extend their services to not only locate the record boundary but decide where the ownership boundary (extent of title) is located must also extend their services to gather information and make decisions that surveyors are not ordinarily trained to handle.

Comments regarding this article can be sent to:

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Knud E. Hermansen is a surveyor, engineer, and attorney. He teaches surveying at the University of Maine and operates a consulting firm providing services in title, land development, boundaries, and easements.

Robert Liimakka is a professor in the Surveying Engineering Program at Michigan Technological University. He is a professional surveyor and holds a MS in Spatial Information Science and Engineering from the University of Maine, Orono and is currently working on a doctorate in civil engineering.

Analysis of an EDM Baseline Comparison

by Steven E. Weible, PLS

For those who have ever wondered how to interpret the "Calibration Report" of an EDM baseline comparison that was produced by a Missouri Department of Natural Resources (MoDNR) application, perhaps the following discussion will help.

Referring to NOAA Technical Memorandum NOS NGS-10, "Use of Calibration Base Lines," the following discussion is found under the heading of "Analysis of Calibration Base-Line Observations" (page 9 of that publication):

> Most EDMI manufacturers routinely attribute certain accuracies to their instruments. Although these accuracies should reflect the instrument's ability to measure a "true value," they may, in fact, indicate only the repeatability (precision) of the instrument or test results performed under laboratory conditions. Theoretically, if the accuracy statistic is given in terms of a standard error (σ), 68.3% of the differences between a "true value" and an observed value should fall within the stated specification. Therefore, this value could be used for decision purposes, i.e., as a test statistic. However, the above is true only for large samples and for known standard errors. Both of these requirements are rarely satisfied. In addition, by using this test statistic for rejection purposes, another type of error may be committed, i.e., the rejection of valid observations. To reduce the possibility of rejecting a valid observation, a limit of 30 (three times the standard error value) is usually chosen for deciding if an observation is acceptable or not acceptable. Theoretically, 99.7% of the differences should fall within the 3σ range.
>
> If 99.7% of the observations fall within three times the manufacturer's stated accuracy and 68.3% fall within the manufacturer's stated accuracy, the instrument can be accepted as working accurately and reliably.

One method of analysis of EDM baseline observations, then, is to examine how the observations compare to a standard specification. Since the distance observations from a baseline comparison are not different measurements of the same segment, some means must be used to ensure an "apples to apples" comparison. This is accomplished by computing the difference between the known distance and the observed distance of each segment measured. On the MoDNR report these differences are shown at the lower portion of the page.

A typical comparison on a Missouri EDM baseline will result in twelve (12) distance observations.

> 68.3% of 12 observations = (0.683)*12 = 8 observations
>
> 99.7% of 12 observations = (0.997)*12 = 12 observations

The standard specification for comparison is the manufacturer's stated precision of the instrument being tested, so, if 8 of the differences are equal to or smaller than the manufacturer's stated precision and all 12 of the differences are equal to or smaller than 3 times the manufacturer's stated precision, then "the instrument can be accepted as working accurately and reliably."

> For an instrument with a manufacturer's stated precision of ±(0.002 m + 2 ppm*Distance) and a known distance of 1234.5678 meters,
>
> σ = 0.002 m + (2 ppm) * (1234.5678 m)
>
> = 0.002 m + (2 / 1,000,000) * (1234.5678 m)
>
> = 0.004 m
>
> and
>
> 3σ =3 * [0.002 m + (2ppm) * (1234.5678 m)]
>
> = 3 * [0.002 m + (2 / 1,000,000) * (1234.5678 m)]
>
> = 0.013 m
>
> See example data in Table 1.
>
> Manufacturer's stated precision: constant = 2 mm
> scale factor = 2 ppm

For this set of data, nine observations are equal to or smaller than the manufacturer's stated precision and all twelve observations are smaller than the rejection limit of three times the manufacturer's stated precision. Therefore, according to this evaluation criteria, the instrument that was tested "can be accepted as working accurately and reliably."

Referring again to NOAA Technical Memorandum NOS NGS-10, the discussion there continues:

> If the differences do not agree within above specifications, then a different method must be used to determine an instrument's acceptability . . . . One such approach is to examine the differences between observed values and published values and determine if the difference is a constant or is proportional to the distance being measured (scale error) . . . . The preferred approach is a least-squares solution that simultaneously determines a scale and a constant correction. This solution is based on the supposition that the differences can be attributed either to a scale correction or to a constant correction, or both.

The MoDNR processing application performs a least-squares computation, using the formulas presented in NOAA Technical Memorandum NOS NGS-10 and the results can be found on the report near the center of the page. If the

Analysis of an EDM Baseline Comparison (continued)

instrument is performing acceptably, the computed system constant and scale factor should be comparable to the manufacturer's stated precision.

For the example data shown above, the computed system constant is –1.4 millimeters and the computed scale factor is 4.2 parts per million.

A primary assumption of this discussion and an important fact that should be recognized by the user is that an EDM baseline comparison is meaningful only if the known distances of the baseline have been determined to a higher degree of precision than that of the equipment being tested, as described in NOAA Technical Memorandum NOS NGS 8, "Establishment of Calibration Base Lines."

Table 1

Known Distance (meters)	Observed Distance (meters)	Delta (meters)	One Sigma Value (meters)	3 Sigma Rejection Limit (meters)
149.9649	149.9633	0.0016	0.002	0.007
399.9523	399.9523	0.0000	0.003	0.008
1374.9235	1374.9207	0.0028	0.005	0.014
149.9649	149.9644	0.0005	0.002	0.007
249.9874	249.9899	–0.0025	0.0025	0.0075
1224.9584	1224.9572	0.0012	0.004	0.013
399.9523	399.9520	0.0003	0.003	0.008
249.9874	249.9897	–0.0023	0.0025	0.0075
974.9712	974.9683	0.0029	0.004	0.012
1374.9235	1374.9171	0.0064	0.005	0.014
1224.9584	1224.9540	0.0044	0.004	0.013
974.9712	974.9664	0.0048	0.004	0.012

In Memory of James Erwin Pauk

James Erwin Pauk, age 66 of Highland, passed away at his home in Highland, on Sunday, February 6, 2011 from complications of lymphoma.

He was raised in Troy, Missouri, by his parents, Erwin and Jeanette Pauk. He graduated from Troy schools, Triad High School, and Western Illinois University.

Pauk was active in several civic and fraternal organizations, including Edwardsville Lodge #99, AF&AM;

Pauk, who had owned Madison County Surveyors in Edwardsville from 1976 until 1998, sold the business to his son, Jeffrey, in 1998. At the time of the sale, he was licensed in Illinois, Missouri, Kansas and Wisconsin. He served as President of the St. Louis Chapter of the Missouri Society of Professional Surveyors.

Other memberships include Rotary International (Paul Harris Fellow,) Boy Scouts of America (James E West Fellow), MENSA, Scottish Rite Bodies, York Rite Bodies and several other Masonic groups.

He was predeceased by his parents and a granddaughter, Rachel Anne Foe Pauk. Remaining are his wife Elizabeth Drew Baumann Pauk and four children: Jeffrey (Melinda) of Edwardsville, Diana Lyle of Saint Charles, Drew Russell (Renee), and Jennifer (Anthony) Norton. Pauk leaves five grandchildren: Thomas, Margaret, Eliza, and Daniel Pauk and Maxton Norton.

Memorial services were held at First Congregational Church in Highland on February 26.

First Survey as an Original Survey

by Norman Bowers, L.S. & PE & Steven S. Brosemer, L.S. Reprinted from *Kansas Surveyor,* March 2011

In the August 2008 Section Lines, Norm Bowers authored an article concerning the two types of boundary surveys: original surveys that create new boundaries, and retracement surveys that locate the boundary previously staked by a surveyor. Upon reflection there is third type of boundary survey, or perhaps a subset of an original survey, that for the purposes of this article we will call a "first survey." Tracts are sometimes created without a survey, so they do not have an original survey to retrace. Perhaps a farmer measures from the road and existing fence lines, then gives that information to an attorney or title person and they create the legal description used in the deed. The farmer sells the tract, the new land owner constructs improvements and occupies to the farmer-surveyed line. Years later, one of the tracts is sold and the new owner wants a survey. This requested survey will then be the first survey of the tract after it was created. This article discusses the original survey and when a first survey is an original survey. In the next Section Lines we will discuss the first survey and the role of the first surveyor on the ground, as well as the options available to resolve the boundary discrepancies that are sure to be discovered by the surveyor.

There are two major types of boundary surveys, the original survey and the retracement. The traditional original survey is made at the time a new tract is created. After the field work is completed, the surveyor writes the legal description and prepares the plat describing the survey. Usually an attorney or title person will prepare and record a deed using the surveyor's legal description. Although minimum standards require the surveyor to record the plat at the register of deeds, it is still an original survey even if it is not recorded.

If we are hired to survey a tract that has had an original survey, our duty is to perform a retracement. Surveyors know that there will be some inconsistencies between our new measurements and the original measurements. The differences are usually larger when retracing surveys that were performed with older equipment. Even though there are differences in measurements, our duty is to retrace the original survey. The Texas court stated it simply in Hart v. Greis, 155 S.W. 2d 997 (1941): "In a suit involving a boundary question, search must be made for the footsteps of the original surveyor and, when found, the case is solved." Not only is it our duty to retrace the original survey, some courts have said it is illegal not to retrace the survey. The Wisconsin Supreme Court said it this way in Pereles v Gross 126 Wis. 217 (1905): "In resurveying a tract of land according to a former plat or survey, the surveyor's only function or right is to relocate, upon the best evidence obtainable, the corners and lines at the same places where originally located by the first surveyor on the ground. Any departure from such purpose and effort is unprofessional, and, so far as any effect is claimed for it, unlawful." It is a sobering thought that if we do not follow rules established by the courts we may be illegally disturbing private property rights.

A surveyor's duty to retrace the original survey is a cardinal rule established by the courts. However, there are some surveyors who have claimed that the surveyor is just a measurer and can just stake the deed, which presumably means that measurements control over found monuments. Surveyors that believe this should consider the words of the Kansas Supreme Court in 74 K 557 In re Richardson: "Not only the evidence but the report of the survey itself shows the surveyor ignored the cardinal rules for his work in not regarding original monuments and known corners and making his survey conform to them instead of the figures on paper. The primary rules for locating city plats upon the ground or lots of a platted city are the same as those for locating deeds upon the ground. They are, in order of precedence in application, as follows: (1) Find the lines actually run and the corners and monuments actually established by the original survey. (2) Run lines from known, established or acknowledged corners and monuments of the original survey. (3) Run lines according to courses and distances marked on the plat." It seems clear that in Kansas monuments hold over measurements.

A traditional original survey is made at the time a tract was created and the surveyor's description used in the first deed of the tract. In some areas an abstractor or attorney would write a legal for a new tract, and the survey would be performed after the deed was recorded. If land owners occupied to the surveyed line certainly almost everyone would agree this is an original survey as it almost simultaneously occurred with the filing of the deed. The first survey made well after a tract is created is more complicated, as it is affected by the actions of the land owners. Jeffery N. Lucas, a surveyor and attorney, discussed first surveys in a December 2007 article in Point of Beginning magazine: "The first order of business is to discuss two closely-related terms (or concepts): "original surveyor" and "first surveyor." I do not believe that the courts make a distinction between these two terms; rather, it seems to be a distinction contrived by surveyors. As with our "rules of surveying" that quite often run afoul of what the law says, this distinction seems to make no difference from a legal standpoint . . . . I have searched case law from all over the country and have not found any reference to this distinction between "original" and "first." What little I found indicates to me that in the eyes of the courts, the original surveyor is the first surveyor, and vice versa. The only power that either surveyor holds is first derived from intent: intent of the grantor and, to a lesser extent, the grantee." Frank Clark in his book Clark on Surveying and Boundaries seems to agree with Lucas, and wrote "Where a survey is once made and parties have acted on the strength of the surveyor's lines, property rights have arisen which cannot

(continued on page 28)

What Do Principles of Land Surveying Really Mean?

by *Gary John Bockman, PE, PLS*

Students of land surveying topics have read and attempted to memorize the various principles stated in their textbooks or in court cases.

As a former land surveying instructor, I have tried to present those principles and offer a few examples of their appropriate use. One of my clients called me recently with a request that revealed an interpretation of one legal principle that I had not previously considered.

In the opinion in the *Day v. Benesh* case, 104 Fla. 58, 139 So. 448, it was said: "The general rule is that a deed is not void for uncertainty (1) if the description is such as well enable a surveyor to ascertain and locate the land, (*Boley v. McMillan* 66 Fla. 159, 63 So. 703), or (2) if it is possible to ascertain and identify the land intended to be conveyed. *Ansley v. Graham* 73 Fla. 388, 74 So. 505."

I had always believed this principle to state that proper wording of boundary descriptions, including detailed descriptions of monuments found or set and their relation to boundaries of parcels or street rights of way would permit another surveyor to follow their work and reproduce it on the ground.

An employee of a client called and stated that I should drive to one of the firm's previously developed subdivisions to confirm that a certain street address was the same as the a specific lot within the subdivision. In addition, I was informed that such had to be completed prior to 1:30 PM the next day so that I could testify in a court case. The court case involved eviction of the tenant from the parcel and, apparently, the tenant was claiming insufficient notice of eviction because the deed description did not match the lease description.

The caller then e-mailed copies of a warranty deed for the parcel that listed the lot number then further described it by metes and bounds and a subsequent lease agreement for the parcel that described the parcel by street address. The client requested that I determine whether the parcel described in the deed as all of Lot ## in SSSSS subdivision and the parcel described in the lease as ### North AAAA Avenue were actually the same parcel and be prepared to testify as to my findings.

The client's attorney had adopted a strategy that if a land surveyor could review the recorded subdivision plat, the purchase deed and the lease agreement then confirm that all these documents referred to the same parcel of land, the concept of sufficiency of a description would be satisfied.

Although another firm had prepared the plat for the subdivision in which the subject lot was located, my firm had prepared the plat for the client's land that adjoined the north side of lot ## in subdivision SSSSS subdivision and the north end and east right of way of the dead end AAAA Avenue.

My approach was to review the recorded plat for the subject subdivision and definitely locate Lot ##, read the warranty deed and confirm that the cited lot number as well as the metes and bounds description matched the plat. I then drove to the address photographed street signs at the intersection at the southeast corner of the subject parcel, then photographed the mailbox at the driveway to the parcel to confirm the street address. Our firm had surveyed around the subject lot previously during design of an adjoining phase in the subdivision and confirmation of the street address and lot number being the same parcel was done.

On the scheduled day of the hearing, the case was continued and has not been heard. The use of a land surveyor's testimony in this case to resolve conflicts between descriptions in a deed and a lease has not been ruled upon by the court. This case does illustrate that a land surveyor must be careful not to develop "tunnel vision" in the interpretation and use of various legal principles.

First Survey as an Original Survey (continued)

be taken away without the consent of the owners, regardless of the errors committed by the original surveyor. It is the extensive duty of the retracing surveyor to see what the first surveyor did, not what he should have done." The Kansas Supreme Court agrees with Clark in 173 Kan 820 In re Moore appeal "Manifestly a new survey cannot be permitted to be employed as a means of disturbing vested rights acquired, as here, in reliance on an earlier survey (8 Am. Jur., Boundaries, § 102) and much less may those rights be thus disturbed in violation of a valid agreement between immediately adjacent property owners. Were the rule otherwise there could be repeated surveys with the result that each would disturb rights acquired in reliance on a former survey. The very purpose of establishing official permanent boundary lines would be completely defeated."

A land owner commissions a survey to establish a permanent boundary line and, if the land owners accept the survey and occupy to those lines, it is does indeed establish a permanent boundary. If it did not, why would a land owner ever commission a survey? It is not the timing of the first survey that is important; it is the acceptance by the land owners. When a surveyor is commissioned to survey a tract that has previously been surveyed and the land owners have accepted the survey and occupied to the surveyed lines, our duty is to do a retracement.

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Educating the Public at the Missouri State Fair

by Chris Wickern, PLS

We started the Height Modernization Survey for the State of Missouri at last year's Fair. It was a big idea brought to the Society by Land Surveyor Sharon Hermann, and made an even bigger idea by our State Land Surveyor, Darrell Pratte. The Height Modernization event brought cameras and reporters to our little tent in our area graciously provided by the Department of Geology and Land Survey Program. They came to listen to the NGS Director, Juliana Blackwell, and to see Governor Nixon start the Survey, getting our profession into the public's eye. In a few short weeks, this went from a good idea to the Director of the National Geodetic Survey introducing Governor Nixon, and the Governor "starting" the Survey. A debt of gratitude is owed to Sharon, Darrell, Dan Govero, Rick Reese, and all those who worked so diligently to make this happen. The other part of this Survey was all of you, the members of the Missouri Society of Professional Surveyors. It is you all who truly made this happen.

The "Kickoff" took about 30 minutes from start to finish, but that was only a small part of the Fair effort. The greater effort was to continue to educate the public for the remaining 10 days and 7-1/2 hours of the Fair, and again, you the professional land surveyor met the challenge! Once again, our volunteers came from all over the State and beyond with Surveyors from Kansas and Iowa participating. Our goal is simply to make the professional available to the public. Thousands of our fellow Missourians had an opportunity to speak with a professional surveyor. For many, it was the first time they have ever spoken with a Surveyor. Many had very real concerns about the boundaries of their property — folks from every area of the state who need to at least speak with a local surveyor about their issues. They were provided an MSPS directory, and shown the listing for surveyors practicing in their county.

2011 brings new opportunities to enlighten the public. Our Society is already coordinating with the Land Survey Program and the Department of Geology and Land Survey. 2011 is the 200th anniversary of the New Madrid earthquake. A seismic calamity our hosts in the Department of Geology and Land Survey want to call the public's attention to. This earthquake was so large that it rang Church bells as far away as North Carolina, and made the Mighty Mississippi flow backwards! The US Congress enacted special legislation "for the relief' of displaced citizens in the quake area, granting lands away from the area. Enter the "New Madrid Certificate" and surveys. Next year's Fair is truly a seismic event that will have a unique land surveying emphasis.

Most of all, we will need you, the professional land surveyor, developing and implementing ideas, to be available on the ground working with, and educating, the public.

DNR Director Mark Templeton, NGS Director Juliana Blackwell, Missouri Governor Jay Nixon, MSPS Past President Ralph Riggs, State Land Surveyor Darrell Pratte (Photo courtesy of Missouri Department of Geology and Land Survey)

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SALES · RENTALS · SERVICE · TRAINING · SUPPORT · CONSULTING · FINANCING

Professionalism, Logic, and Law

By Wendy Lathrop, LS, CFM Reprinted from *Georgia Land Surveyor,* Nov-Dec 2010

Three out of the four states in which I am licensed have mandatory continuing education requirements for renewing my professional land surveying licenses. The fourth is one of a minority without such requirements, including eight other states, several territories, and the District of Columbia. I don't consider it an imposition to comply with these requirements, and take credit only for programs I attend rather than present. After all, it is my professional responsibility to keep my mind active and my skills growing to best protect "the health, safety, and welfare of the public" (a standard concept throughout the states), knowing that the lay public has a legal right to rely upon the expertise presumed to accompany the professional status awarded by State Boards.

A recent discussion on the topic of acceptable and appropriate continuing education piqued my curiosity about differences between the states and territories that do enforce its completion prior to license renewal. My first stop was the website of the National Council of Examiners for Engineering and Surveying (www.ncees.org). While not knowing the age of the data on this site, information summarized for each state and territory told me that at the time of compilation seven states required course work on state-specific technical standards, six required ethics classes, and one mandated state-specific laws and professional conduct subject matter. This is not to say that other states prohibited these three areas as acceptable for fulfilling credits for license renewal, only that a number of states would not renew licenses unless these topics were included in the continuing education completed by the licensee. Often these same subjects were recommended by other State Boards, but not compulsory.

A prime source of complaints against surveyors is lack of sound office and business management skills: from time management to employee relations, from documenting incoming messages to communication, negotiation, and customer service skills.

But during this investigation, one particular state's categorization of certain topics as not appropriate or acceptable troubled me, and I went to that state's Office of Professions website to make sure that there had been no error on the NCEES site. There had not. While approving subjects in "Land surveying methods and techniques; or other matters of law and/or ethics which contribute to the practice of land surveying and the health safety, and/or welfare of the public," the state's site also had this to say:

> *The subject matter of the course or educational activity must be related to professional practice. Subject areas that are not so related, such as, risk management, limiting the design professional's liability, project management related to profitability and maximizing fees, marketing and public relations, insurance, laws related to arbitration, mediation, liens (unless they are related to safeguarding the health, safety, and welfare of the public), real estate, real estate development, expanding a design professional's business, basic Auto CAD, personal development, general office management, accounting/financial planning, succession planning, zoning as it relates to increasing a developer or engineer/land surveyor's profitability, design build (unless it includes information on the laws related to design build and its limitations in [State Name Omitted]) are nonacceptable subjects.*

This Board is obviously trying very hard to protect the public and prohibit selfish pursuit of "personal development," although certain topics falling under that broad umbrella certainly would help protect the public. What about communications skills? Unless that state is unique, it is likely that a majority of complaints against licensed surveyors arise because of poor communication between client and surveyor, or even a complete lack of communication, whether verbal or written. While being better listeners and better communicators may help our marriages, this kind of personal development also enhances our clients' understanding of our work and its value. Coworkers and employees coincidentally reap the benefits of more open, more regular, and clearer communication.

Another prime source of complaints against surveyors is lack of sound office and business management skills. Among the banned topics, "general office management" includes everything from time management (making sure we can deliver services within promised time frames) to employee relations (including the legal matters of equal opportunity, ADA compliance, and tax payments), from documenting incoming messages (so we address client concerns appropriately) to communication, negotiation, and customer service skills (see the forbidden "personal development," above). There is some overlap between this list and the equally outlawed "accounting" (good records mean no overbilling).

In the long run, this Board has eliminated some subjects that do serve society and the community at large. While other states also underscore their concern with public protection, they nevertheless include as acceptable continuing

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Professional Topography: The True Meaning of Professional

By Joseph V. R. Paiva, PhD, PS, PE Reprinted from *Georgia Land Surveyor,* Nov-Dec 2010

Every dictionary and encyclopedia defines the word "professional" in different ways.

These definitions often involve the possession of a well-defined body of knowledge, education and experience; the application of that body of knowledge; and conformity to ethical or technical standards. When I get into discussions with other "professionals," sometimes I also hear descriptions like well-dressed, carries himself or herself well, etc. A definition I like to use is as follows:

A professional:

- provides service at a higher level than one would get from a layperson;
- advocates for clients yet is impartial;
- possesses ethical standards of performance for the work and the client relationship;
- will admit when he or she is wrong or doesn't know; and
- works with other professionals and stakeholders for the good of clients, the profession and society.

Note that I did not call this the definition of a professional surveyor — just a professional. You may think that it is not complete, and you may not even agree with the direction I'm taking on this, and that's OK. But it is important for all of us "professionals" to think about this matter. Before we can decide that we want to be professional, we must be very clear about what that word means — not only to ourselves but also to everyone we work with, including our clients.

My suggestion is that you write down what you want that word to define. Break it down. Then figure out what it should mean in terms of speech, actions and even dress.

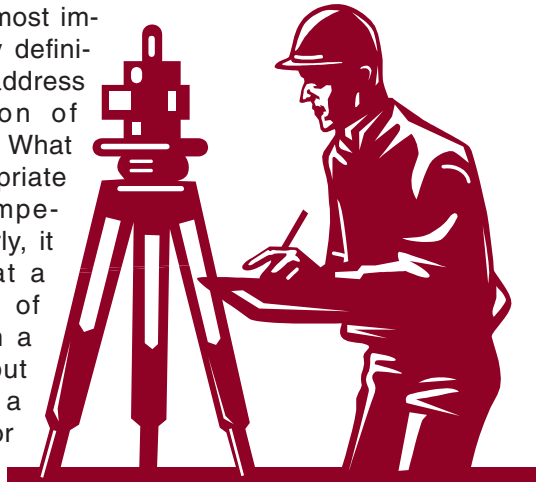
Moving Beyond a License

Once you have defined the full meaning of "professional" for yourself, think about whether there is any hope of getting other surveyors, geomatics professionals, geospatial data managers or other related titles to uphold what you might consider to be the broad definition. Ideally, all surveyors need to subscribe to the same general set of criteria for being a professional. But will we ever have a majority of surveyors agree on a broad definition?

I doubt we could get a majority of surveyors to uphold any definition, except maybe the possession of a surveying license. But I would vehemently disagree that mere possession of a license is enough to call oneself a professional. Many licensed surveyors fall short of my definition of a professional.

And my definition may not even be adequate. For example, where does the ability to communicate well verbally and in writing fit in? Most surveying curricula and certainly the ABET criteria require the development of communication skills, but such skills are often lacking in real-world practice.

Perhaps most importantly, my definition doesn't address the question of competence. What is the appropriate level of competence? Clearly, it should be at a higher level of service than a layperson, but that leaves a lot of room for variation.



One of my favorite examples of a lack of competence and professionalism is a sign I saw a long time ago that had a word misspelled. Whose responsibility was it to spell check the sign? It would be very easy for the sign company to say, "Hey, we just followed the customer's instructions." But is that the desired level of service?

Agreeing to Agree

Numerous questionable areas exist within our practice that surveyors respond to differently. But I'm not sure those differences are acceptable.

I would vehemently disagree that mere possession of a license is enough to call oneself a professional. Many licensed surveyors fall short of my definition of a professional.

For example, when some surveyors have finished their fieldwork, done their analysis and are finally ready to set a particular corner, they will set it no matter what — even if it is 0.02 feet from an existing monument that appears to have been set for the same purpose. Other surveyors will

(continued on page 34)

Professional Topography: The True Meaning of Professional (continued)

accept the position of the existing monument. Likewise, some surveyors treat the results of their boundary line location as a secret to be kept between the client and themselves. But others — correctly, in my opinion — realize that every line set also sets the line of at least one other adjoiner. Paraphrasing Maurice Schumann, "When will surveyors realize that they never only mark their client's line?"

> ***"When will surveyors realize that they never only mark their client's line?"***
>
> ***— Maurice Schumann***

In general, we surveyors lack an awareness of and appreciation for what it means to be professional. Is this because we don't consistently practice the role of professional? Is it because we get trained in so many different ways, many of which don't address the issues covered in a discussion of what it truly means to be a professional? I believe there are understanding what professionalism entails beyond the license.

As a profession, we aren't addressing issues like these seriously enough to ever achieve overwhelming majority support for the "right way" to be professional.

Joseph V.R. Paiva, PhD, PS, PE is consultant to developers and marketers of products for the geomatics industry. He can be reached at jvrpaiva@swbell.net

Professionalism, Logic, and Law (continued)

education topics "total quality process," "land surveying software training," and "business practices including project management, risk management, and ethics, which have demonstrated relevance to the licensee's area of practice."

We don't all begin with identical experience, and we don't continue our careers on identical paths, encountering identical situations under identical circumstances. Recent work on a committee defining a Body of Knowledge for surveying has opened wide-ranging conversation with other surveyors about what our profession really encompasses, and how to attain, retain, and improve our mastery of the specialized knowledge base required to be true professionals. Within the broad spectrum of "surveying" we find various levels of expertise in broad areas of imaging, positioning, land use and development, geographic information systems, and legal knowledge.

> ***Once a State Board sets its regulations, it can be hard to retract and revise them.***

We do find common elements between these broad areas, although perhaps achieved differently. And so, some surveyors want to fill gaps in their knowledge base while others pursue highly specialized information. This points to a need for some flexibility in acceptable subjects intended to strengthen or maintain technical, ethical, and managerial competency. The unnamed state's prohibition against "basic Auto CAD" is biased against surveyors who employed other approaches to computing and drafting in their earlier careers and now need to understand what they are supervising others to do. Certainly such understanding makes them more professional, allowing a fuller review of the documents presented to them for signature and seal.

Once a State Board sets its regulations, it can be hard to retract and revise them. Overly specific and shortsighted regulations may outlaw courses that would help us improve our practices and public interactions, courses that fulfill the public purpose of continuing education. The 20% of our country that does not yet have this requirement has an opportunity to review existing approaches carefully and get it right.

Wendy Lathrop is licensed as a Professional Land Surveyor in NJ, PA, DE, and MD, and has been involved since 1974 in surveying projects ranging from construction to boundary to environmental land use disputes. She is a Professional Planner in NJ, and a Certified Floodplain Manager through ASFPM.

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If You Ever Wondered Why . . . Ask Mike!

by Michael Whitling, PSM

Why do we have to "go through customs?"

The word custom derives its name from the Middle Ages word "custume" which was equivalent to "costume" or habitual mode of dress. This label was used so frequently that it attached itself to any common usage or practice, whether involving clothing or not. One such common practice was that of collecting rents and taxes. Feudal rulers were careful to make sure everyone paid, so that these levies become the "custom." Taxes were extended to merchants traveled through cities and arriving at ports. Stations were setup to collect these fees and were known as "customs houses." This has continued through the years so now those traveling across national boundaries must "go through customs."

Why do we "knock on wood" for luck?

Speaking of customs, it was an ancient belief that spirits either dwelled in or guarded trees. Greeks worshipped the oak tree as it was sacred to Zeus, and Celts believed in tree spirits, and both believed touching sacred trees would bring good fortune. Irish lore holds that touching wood is a way of thanking the leprechauns for a bit of luck. Chinese and Koreans thought the spirits of mothers who died in childbirth remained in nearby trees. A Jewish version traces the origin to the Spanish Inquisition of the 15th century. The then persecuted Jews fled to synagogues built of wood, and they devised a coded knock to gain admission. Since this practice spared countless lives, it became common to "knock on wood" for good luck.

Quick Facts:

The average cup of coffee contains more than 1000 different chemical components, none of which is tasted in isolation but only as part of the overall flavor.

Fish do not have eyelids and therefore cannot blink. Since fish live in water, they have no need for the hydration of the eyeball that an eyelid provides.

In Alaska, authorities have found it necessary to declare it illegal to tether a dog to the roof of a car.

A cat wags only the last two inches of it's tail when it is happy. When it wags its whole tail, it is angry.

One hectare of lowland rainforest in South America can contain as many frog species as in all of North America.

In the United States, a pound of potato chips costs two hundred times more than a pound of potatoes.

Paul Revere was an accomplished and notorious art forger.

Missouri Society of Professional Surveyors
54th Annual Meeting

University Plaza Hotel, Springfield, Missouri
October 13–15, 2011

Speakers and Topics

The Original GLO System and its Resurveys ..... Dick Elgin
Surveying Business Session ..... The Great Game of Business
Understanding Deeds and Descriptions .....Walt Robillard
Ethics and the Professional .....Walt Robillard
GPS .....Tom Bryant
Contracts and Contract Law for the Professional.....Walt Robillard
Minimum Standards ..... Speaker TBA

Surveyors Got Talent

Talent Show at Annual Meeting Promises to Be "Interesting"

Come see the hottest performers from across the state ready to compete. This talent search is open to acts of all ages, shapes and sizes! This will be a true celebration of the American spirit, featuring a colorful array of hopeful stars, including singers, dancers, comedians, contortionists, impressionists, jugglers, magicians and ventriloquists, all vying for their chance to strut and perform on stage hoping to win the survey community's hearts — and a fabulous prize.

When: October 14, 2011, 6 p.m.
Where: Vietnam War Memorial Post 639, Springfield, MO
Why: Because Surveyors Got Talent!

To enter send a 50-word (maximum) description of your act including the names of the performers along with your name and contact information to MSPS, PO Box 1342, Jefferson City, MO 65102 or email msps@missourisurveyor.org no later than June 30, 2011.

This is a family-friendly production and is part of the 2011 Annual Conference of the Missouri Society of Professional Surveyors

Salazar Appoints 15 Members to NGAC

Secretary of the Interior Ken Salazar has appointed 15 individuals to serve as members of the National Geospatial Advisory Committee (NGAC), which provides recommendations on federal geospatial policy and management issues and advice on development of the National Spatial Data Infrastructure (NSDI). The NSDI promotes sharing of geospatial data throughout all levels of government, the private and non-profit sectors, and the academic community.

The new appointees to three-year terms on the NGAC are:

*Mr. Dick Clark, State of Montana**
*Mr. Jack Dangermond, ESRI**
Ms. Joanne Irene Gabrynowicz, University of Mississippi
*Dr. Jerry Johnston, U.S. Environmental Protection Agency**
Ms. Laurie Kurilla, Ventura County, CA
Dr. E. Donald McKay, State of Illinois
*Ms. Anne Hale Miglarese, Booz Allen Hamilton**
Dr. Timothy Nyerges, University of Washington
*Mr. Matt O'Connell, GeoEye**
Mr. Pat Olson, Aero-Metric, Inc.
Mr. Mark Reichardt, Open Geospatial Consortium
Mr. Anthony Spicci, State of Missouri
Mr. Gary Thompson, State of North Carolina
Mr. Gene Trobia, State of Arizona
Mr. David Wyatt, Eastern Band of Cherokee Indians
** Re-appointed to a second term on the NGAC.*

The NGAC provides a forum to convey views representative of partners in the geospatial community. The members of the NGAC report to the chair of the Federal Geographic Data Committee (FGDC), which is the Federal interagency executive group responsible for providing leadership and direction in Federal geospatial programs. The FGDC is chaired by the Secretary of the Interior or the Secretary's designee.

The NGAC meets three to four times per year. The public is invited to comment and make suggestions at all committee meetings, which will be announced by publication in the *Federal Register* at least 15 days before the meeting date. The U.S. Geological Survey, a bureau of the Department of the Interior, provides support services for the NGAC. The NGAC functions solely as an advisory body.

Geospatial data and products, including maps, simulations, and databases, are invaluable tools in the effective management of utility infrastructures, transportation, energy, emergency management and response, natural resource management, climate analysis, disaster recovery, homeland defense, law enforcement, protection planning and other civilian or military strategic issues. The newly-appointed members of the NGAC represent the varied interests associated with geospatial programs and technology.

The NGAC was created under the Federal Advisory Committee Act, which was enacted by Congress in 1972 to ensure that advice rendered to the executive branch by advisory committees, task forces, boards, and commissions formed by Congress and the President, be both objective and accessible to the public. The Act formalized a process for establishing, operating, overseeing, and terminating these advisory bodies.

Additional information about the NGAC, including a complete list of the 28 committee members, is available at www.fgdc.gov/ngac

Growing Up Without a Cell Phone

If you are 50 or older you might think this is hilarious.

When I was a kid, adults used to bore me to tears with their tedious diatribes about how hard things were: walking 25 miles to school every day — uphill — both ways — barefoot . . . .

I promised myself I would never lay a bunch of crap on my kids about how hard I had it and how easy they have it.

But now that I am past 60, I can't help but look around and notice that the youth of today really don't know how good they've got it.

We didn't have the Internet. If we wanted to know something we had to go to the damn library and look it up — in the card catalog!

No e-mail: We had to actually write somebody a letter — with a pen! Then walk all the way to the mailbox, and it would take like a week to get there. Stamps were 10 cents!

Child Protective Services didn't care if our parents beat us. In fact, the parents of all my friends also had permission to kick our asses. Nowhere was safe.

There were no MP3s or Napster. If you wanted to steal music, you had to get to the record store and shoplift it yourself! Or you had to wait all day to tape it off the radio, and the DJ would usually talk over the beginning and screw it up! There were no CD players. We had tape decks in our cars. We'd eject the tape and it would come undone rendering it useless!

Without cell phones, you left the house and you might be out of touch with your "friends" for like hours! (omg) And we never got to annoy everyone else while "texting."

PlayStation? Xbox? High-resolution graphics? We had Atari 2600 with Space Invaders. Your "Avatar" was a 12-pixel box. You actually had to use your imagination! And there were no multiple levels — just one repeating pattern that got faster and faster and harder and harder until you died! (Just like life.)

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