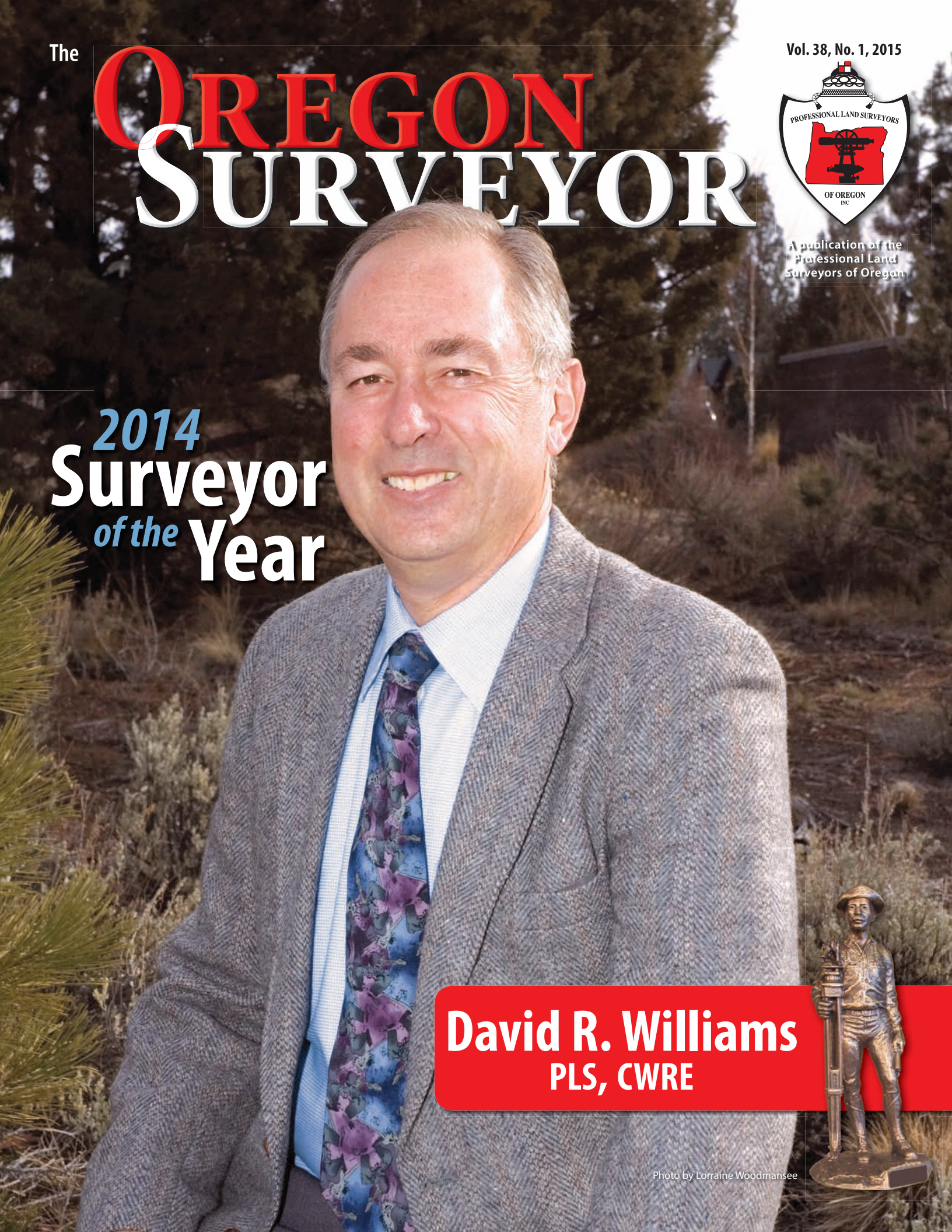
The Oregon Surveyor

Vol. 38, No. 1, 2015

A publication of the Professional Land Surveyors of Oregon

2014 Surveyor of the Year



David R. Williams
PLS, CWRE

Photo by Lorraine Woodmansee

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THE OREGON SURVEYOR

Vol. 38, No. 1, 2015

Professional Land Surveyors of Oregon

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Contents

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Leaning in

■ *Greg Crites, PLS*

In keeping with the theme of my last editorial, I thought I'd take the liberty, or assert the right, simply because I hold the position of editor of this magazine, to delve a little deeper into the concept of what a "professional" means from the perspective of a land surveyor.

We've all heard of the importance of giving back to our profession, commensurate with what the profession has given us! This is not a simple equation and means different things to each of us, as many of the stories within the pages of this magazine that I've been soliciting from our membership will attest. I'm most interested in tickling the interests of those within our membership who *may* be considering volunteering some of their valuable time for the betterment of the PLSO. We need you, especially if you're young, energetic, eager to learn and interested in leaving some kind of legacy within your profession beyond your seal and signature.

One of the truisms of the operation of the PLSO is that without the hard work of a few dedicated professionals, the organization wouldn't exist. Each and every one of those individuals, when asked, would tell you that their involvement in the PLSO has enriched their professional life (and probably their personal life) in more ways than they ever could have imagined. Having served in many "management" capacities for the organization, I can attest to the benefits of getting involved, not the least of which has been the enrichment of my life from getting to know many of my peers in other parts of the country.

If I said that getting involved with the PLSO didn't involve any personal time and effort, I'd be lying; but think about it. How much time have you spent on the telephone with potential clients from whom you'll never get a dime? All of your professional expertise leveled at them, yet it's as if your knowledge and skills were water off a duck's back. To them, you're a commodity.

On the other hand, there is much greater satisfaction to be had in the company of your peers, those who've already stepped on the land mines laid for us in this business, who've already wrestled with the complexities of a boundary resolution that you may have yet to encounter or have cut their teeth on an area of professional practice where you have insufficient expertise (and are thereby a danger to yourself and your prospective client). With respect to that last comment, much of my understanding of my own skill sets comes from my professional involvement. My peers have given me perspective. How can you put a value on knowing with certainty when it's time to walk away from a possible contract because you know what's required is not your cup of tea?

Some of you know that I love to read. My sister gave me a Christmas present this year that I wasn't expecting: A small paperback written by Garth Stein entitled *The Art of Racing in the Rain*. He has a quote in there that really speaks to me: "That which we manifest is before us; we are the creators of our own destiny,..." If I may paraphrase, you only get out of something what you put into it! The PLSO and our profession are waiting for you to put something in!

I used to live next door to Mary Anne Rademacher. Another northwest author, she has written at least one book of quotes and an excerpt from one of her sayings speaks to the theme of my discussion. She calls it "leaning in to life." I like that.

Years ago, I had a passion for skiing and loved to go as often as time and wherewithal allowed. After I was married (the first time), I dragged my then wife along in hopes she would share in my joy. Her self-confidence was her worst enemy. One day, in a not-so-honest effort to convince her of her abilities, my buddy and I skied ahead of our wives to the top of a "Black Diamond" run at Mt. Bachelor. Upon reaching the warning sign, we turned it around so the two ladies couldn't see it as they approached. When they arrived within sight of us, we dropped into the fall line and slalomed down the mountain some distance below the reversed sign but still within sight of it. Making sure our wives were still in tow, we stopped for a breather. Once I had their undivided attention, I pointed up the hill at the sign and exclaimed, "Well, look at what you guys just skied down!" That one run made them both much better skiers. It's not that their skills changed one iota, but their state of mind certainly did. This story reminds me of "leaning in." When you're at the top of a steep descent, your natural inclination is to lean over the edge to see what lies before you.

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Out to pasture? *Whoa!* Not quite yet

■ *John Thatcher, PLS; 2015 State Chair*

It was a close call. In a program to slim down and become more efficient and profitable (and retain a more youthful demographic?), my former employer offered a one-time Voluntary Retirement Program (VRP) with an extra-generous severance and a one-month decision window. Certain writings being on the wall for me, I applied for the VRP and was accepted. My "retirement" became effective November 4, and the next two weeks gave me a taste of the green grass of the retirement pasture. Nice. Then I had lunch with an old party chief friend whom I used to supervise and who now owns his own thriving surveying company. He snapped me right up, and I didn't even have to prepare a resume. Good bye pasture, hello again comps, calcs and chords. Maybe in a couple more years…

Eventually, soon even, some young geomatrician will have to step into my shoes. We've all been bombarded lately with the statistics on the aging of our profession and the need to interest young people in filling the void being created as our numbers dwindle by attrition. That issue (can we call it a crisis yet?) is one of several that your PLSO is taking seriously by devising and funding programs for outreach. It is the reason the "Scholarship Auction" was renamed the "Education and Outreach Auction." It is the reason outreach is one of the four chief strategic directions in PLSO's Strategic Plan. It is one of the motivating factors that keeps Tim Kent and his cadre of adjunct Geomatics instructors passionate about the education programs at Clark College and Oregon Institute of Technology.

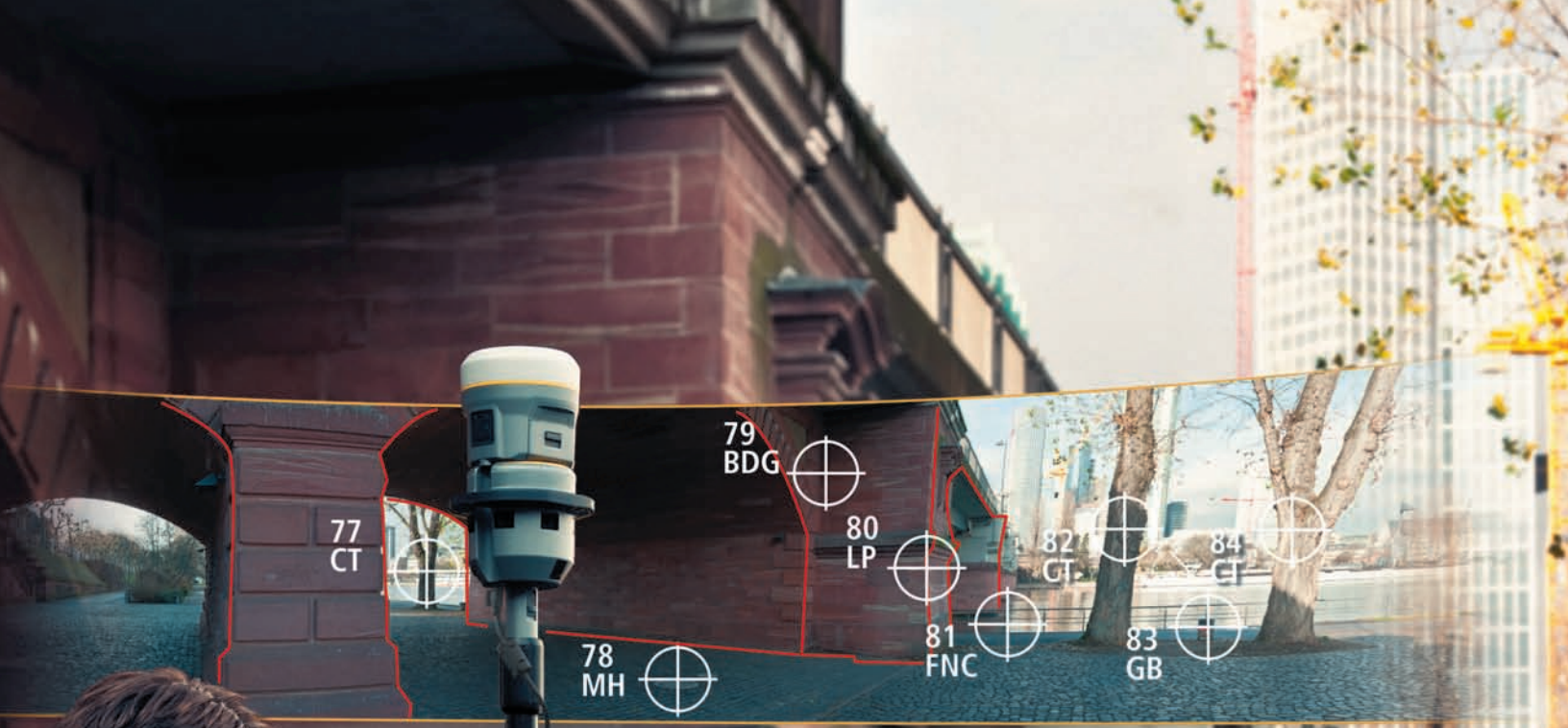
Pioneer Chapter and the Lower Columbia Chapter of LSAW have a tradition, established several years ago, of alternately hosting a joint December meeting. The meeting is predominately social in nature—better halves are invited, entertainment is booked, and door prizes are given out. It is a chance to take pause before the busy holiday season and network with other surveyors from both sides of the river. This year and last, Tim Kent had arranged for the students in the Clark College Surveying Program to attend and be introduced. I really hope student attendance becomes an integral part of this tradition. If the young students whom Tim introduced are any indication, the profession will be in good hands, and we of retirement age can begin to let go with a clear conscience.

So attracting and mentoring young surveyors is one of the goals and benefits of a robust outreach program. Providing scholarships is and always has been a very important tool in pursuit of that goal. In 2014, PLSO awarded $14,500 in scholarships. The dollars came from the earnings of our scholarship fund, which has now swelled to approximately $260,000. The PLSO board gets it that members may want their auction dollars to go exclusively toward scholarships. For that reason, auction-goers can now choose where their dollars go—either toward the scholarship fund or toward the other outreach programs. PLSO's outreach committee is called the Education Goals & Action Committee, or EGAC (as my dear old mother used to say, "That's enough to gag a maggot."). EGAC focuses on programs such as TrigStar, job fairs, publicity for PLSO, updating the PLSO brochure, website enhancements and erecting the PLSO booth at conferences.

"If the young students whom Tim introduced are any indication, the **profession will be in good hands**, and we of retirement age can begin to let go with a clear conscience."

We still have work to do, and always will. Members who give their time and talent to be PLSO leaders on all levels know it's not always easy to fill shoes when it's time to move on. We have to do that work, though, in order to traverse into the future. Things will change dramatically as the next generation takes the helm of the profession and its professional societies from us "honored citizens." They will be good changes.

Here's wishing all of you a happy and prosperous new year. Do some good work, make some money, have some fun. Use the hand rail (that's my way of saying be safe). The best advice I ever got was from a one-hundred-year-old woman, sharp as a tack, at a wedding in Bozeman, Mont., in 1979. She simply said, "Keep interested." That's good advice for everybody.



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A year of transition

■ *Aimee McAuliffe, PLSO Exec. Secretary*

In 2014, the Professional Land Surveyors of Oregon experienced a year of transition. I first met you at the Annual Meeting of last year's conference, which coincidently was one day after I was hired as your Executive Secretary. It has been a pleasure to get to know various members and see how dedicated the volunteers of PLSO are. Both Lee Spurgeon and John Thatcher have worked together as an amazing team and have been available to ease every point of transition. Your committee chairs are equally dedicated. Working with Gary Johnston, Gary Anderson, Greg Crites, Carl Sweeden, Joe Ferguson, Ben Stacy and Jered McGrath has been extremely valuable.

In case you aren't sensing a theme here I want to say it outright. What makes PLSO great is the volunteers that believe in and work for our professional community. A volunteer is a special person. It's easy to forget that they have lives and responsibilities outside of this association when I receive responses to email requests well past closing hours and into family time, highlighting a willingness to help out in any way they can. Being a volunteer can often be thankless as well. It's often assumed that they have the time this year, because they did last year.

In fact, one of the elements that associations compete with for member involvement is time, as if there never seems to be enough. We all have responsibilities—whether it is work, family or friends. It's always easier to say "later" or "I'm too busy" and not step up to the plate and then be critical if something doesn't happen quite the way we prefer it to. I've been guilty of this myself. So, I want to take a moment to recognize you—the membership—who are driving the mission and activities of PLSO. I know there is not always agreement on issues, but that is reality when an organization represents so many dynamic professionals. If there is anyone in this organization that has the slightest interest in volunteering—whether it's at your chapter level, for a committee and eventually the Board of Directors, I encourage you to do it. Not only will you create strong professional connections, but lifetime friendships are sure to follow.

Looking back on our year of transition, I see a path forming to where we want to go. Steps towards making the website more user friendly for members and the public have been made—which can lead to more marketing opportunities, that can not only create a stronger membership base but remind the public why hiring a surveyor is important.

We've had conversations about our school programs and what can be done on our end to make them stronger. Welcoming and mentoring new graduates is something dear to many members' hearts. Both of these outreach activities—along with our scholarship programs work hand in hand for PLSO's benefit.

Membership numbers for this year are fairly similar to last year. As of January 15, we are at a total of 558 members. Financially we are stabilized. All expenses were paid by existing streams of revenue, our reserves are saved for another rainy day and we are on target for the same for next year.

Thank you to everyone for a great first year as your Executive Secretary, I look forward to making 2015 even better. ⊙

FROM THE EDITOR...from page 2

Successfully serving your profession requires a certain amount of leaning in! For those of you who are so inclined, just think of standing at the top of a Black Diamond run at Mt. Bachelor (or any other mountain) on a perfectly tuned pair of skis with which you're very comfortable. Two feet of fresh powder snow lies on the slope below. You plant your poles, push off and then experience this incredible sense of weightlessness as you float over the snow whilst carving big swooping S turns down the mountain at speed. Now, you may not feel that exact same sense of exhilaration serving the organization or kibitzing with your peers, but then again...! So turn that sign around along your career path and be a part of charting your course. At the very least, you'll have a better understanding of what may lie ahead! ⊙

The views expressed herein are mine and mine alone and in no way should be construed as representing ANY opinions shared by our membership or a stance on political issues by this organization.

2014 Surveyor of the Year

David R. Williams, PLS, CWRE

David R. Williams, PLS, CWRE. Photo by Wendy Randall

Nomination Letter

On behalf of the Central Chapter of Professional Land Surveyors of Oregon, we respectively submit our nomination for the 2014 Surveyor of the Year as David Williams. Dave has been a Corporate Member of PLSO for more than five years; has demonstrated a history of high competence, integrity, and professionalism; assisted qualified and interested people into the advancement within the profession; and has a career long service to the profession.

The Central Chapter believes David's involvement and duties of being Chapter President, holding Secretary positions, community involvement, and being an active participant of our local chapter, has shown the characteristics of those worthy for this honor. ⊙

Submitted by:
Kevin Samuel, Central Chapter president-elect and secretary
Parneli Perkins
Mike Berry
Ken Grantham
Brian Reeves
Chris Munson
Richard Bryant (Surveyor of the Year, Life Member)

Biography

David Williams, Oregon PLS 2686 and President of Hickman, Williams & Associates in Bend, Oregon, was born in Tillamook and raised on his parent's dairy farm. After graduating from high school, Dave attended Oregon State University where he received a Bachelor of Science degree in Mechanical Engineering.

After college, Dave worked at a variety of jobs before traveling to Alaska where he managed pipeline camps on the North Slope. When work slowed on the Alaskan Pipeline in the mid-1970s, he returned to Oregon and settled in Bend where he went to work at George Cook Engineering.

Dave thrived in the engineering/surveying business, becoming a project manager for Cook and an accomplished businessman. Dave became the main contact for clients, title companies, realtors, planners and other engineering/surveying firms at George Cook Engineering. When the company reorganized as High Desert Engineering he was made vice president. His years with Cook in the mid-1970s through the early 1980s established Dave's local reputation as a bright, hardworking, honest and business savvy surveyor. Additionally, Dave exhibited an enthusiasm for embracing new technologies, using some of the first EDMs and one of the earliest electronic theodolites, the K & E Vectron, for a 1978 job in the Three Sisters Wilderness.

After Cook retired and shuttered his business in 1984, Dave went to work with Century West Engineering Corporation in Bend. At CWEC, he and Gary Hickman ran the surveying department and continued to push the envelope of cutting edge technology, using CADD and the early computerized Wang flatbed plotter.

In 1987, Dave and Gary Hickman left CWEC to form Hickman, Williams & Associates (HWA), a full service surveying, engineering and land use planning company. After a few years, Gary Hickman

» continues on page 8 »

» DAVID WILLIAMS, from page 7

left the business to move to Portland and Dave recruited engineers and surveyors from his previous business associations to form a vibrant and successful company which still has a strong presence in Central Oregon. As is par for the course with Dave, HWA was one of the first companies in Bend to fully commit to using GPS and RTK as a standard tool for increasing efficiency without compromising accuracy under our wide open satellite filled skies.

Dave is well known in Central Oregon as an amiable and sensible proponent for the land surveying profession, particularly in the area of conducting business professionally and profitably. He keeps in contact with local surveyors and is always open to discuss survey related issues, contentious or otherwise, with his peers from competing firms. He is an excellent problem solver and many of us use him as a sounding board for both boundary related problems and business advice.

During his tenure this last year as PLSO Central Chapter President, he has led many discussions concerning business practices, contracts, liens and surveyor-client relationships. He has always stressed that surveyors are good at surveying—resolving boundary problems, mapping land, constructing roads—but to better our station as professionals we need more solid business acumen.

In his unending quest to promote the surveying profession, Dave has also forged friendships and alliances with local builders, developers, realtors, planners and title companies and, at every opportunity, he has stressed to these land development professionals the importance of hiring professional land surveyors to ensure that their property boundaries are established and marked. Furthermore, he used to teach surveying classes at Central Oregon Community College in conjunction with their Forestry and Engineering technologies programs.

Dave first joined PLSO in 1977 and has been a continuous member since 1988. He has been very active with the Central Chapter, serving as secretary/treasurer in 2010 to 2011, president elect in 2012 and chapter president in 2013.

Dave and his wife Trudy have two grown daughters, Katie and Kelly. Dave is an avid skier, both downhill and cross country, a hiker, mountain biker, kayaker and hang glider pilot. ⊙

Resume

Education

Bachelor of Science, Mechanical Engineering, Oregon State University

Registrations

Professional Land Surveyor, Oregon, No. 2686
Water Rights Examiner, State of Oregon, No. 413

Affiliations

PLSO of Oregon

Principal, President

Dave's 37 years of experience in surveying, mapping, and engineering, coupled with his background in project management of all surveying and platting for high profile resort and development projects, makes him an invaluable resource. One of the founding partners of Hickman Williams & Associates in 1987, Dave's knowledge of AutoCAD for mapping and civil engineering design projects enables him to guide his technical teams with a hands-on approach to ensure quality production for our clients.

Selected Experience

Resort and Condominium Projects: Project Manager responsible for the surveying and plat preparation services provided on numerous Central Oregon projects, including Mount Bachelor Village Resort/River Ridge Townhomes, Powder Village, Cedar Creek, Skyewest Townhomes, and Eagle Crest Resort, including design collaboration and platting for all phases of this planned unit development (now in its final phase).

Commercial/Industrial: Project Manager responsible for the boundary, topographic, foundation, or ALTA surveys and construction staking services provided on Central Oregon commercial projects that include: Fred Meyer, High Desert Village, Mill Point, The Old Mill District, Bend Athletic Club, Pinebrook Plaza, Redmond BiMart, Big R in Redmond and Sun Mountain Lanes.

River's Edge Planned Unit Development, Bend, Oregon. Managed the topographic and boundary surveying services for the 300-unit planned development, golf course, and 6,400 lineal foot extension of Mt. Washington Drive.

AT&T Communication Lightguide System: Project Coordinator for approximately 800 miles (over $1 million in fees) of new Lightguide (fiber optic) cable along routes through Nevada, California and Oregon. Project involved construction staking, research, location, selected topography surveys, and preparation of easements. All private right-of-way mapping was provided to AT&T in AutoCAD format.

Hillside Park, Bend, Oregon: Prepared plat, assisted in preparation of improvement plans, and coordinated construction staking for this hillside high-end development located on the flanks of Awbrey Butte. ⊙

A Workshop for Surveyors and GIS Professionals

Sponsored by Oregon GPS User's Group

Tutorial on the use of the UNAVCO software **TEQC** and US Army Corps of Engineers software **WinTEQC** and **Proposed new GNSS Surveying Standards**

TEQC and WinTEQC, *presented by Lou Estey and Mark Huber*

TEQC was developed by UNAVCO to edit and manipulate GNSS data files that often must be translated to RINEX, edited to decimate the collected interval, delete unwanted satellites, trim off data at the beginning or end of the occupation, etc., as well as performing some quality control tests on the collected observations. It is a command line driven application in which the user supplies the various parameters to tell TEQC what needs to be done.

WinTEQC is a MS-Windows-based program which simply provides a user-friendly interface that prompts the user for input and passes that to TEQC for processing. WinTEQC also has various tools for working with OPUS output from NGS.

New GNSS Surveying Standards, *presented by Gregg Helmer*

One aspect held in trust by the survey profession is the authority to certify as to the accuracy of geodetic control networks. The California Land Surveyors Association and California Spatial Reference Center commissioned the drafting of statewide standards and specifications for GNSS geodetic control surveying jointly published in 2015. This workshop session introduces the salient points and guiding principles for professional practice of GNSS geodetic control as agreed upon by the taskforce, together with disruptive technologies and modernized geodetic datum.

When	**Thursday, April 9 • 7:30 AM – 4:30 PM**
Where	**NW Eola Viticulture Center, Chemeketa Community College, 215 Doaks Ferry Rd., Salem, OR 97304**
Cost	**$75 (Yes, tasty lunch provided)**
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Attendees will be emailed any handout materials a few weeks before the workshop and should be self-printed prior to your attendance. No materials will be provided at the workshop.

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Oregon GPS User's Group Workshop, April 9, 2015

Cadastral tales

■ *Bob Taylor, PLS*

#16 Leaving The Cadastral Surveyors

Cold Fingers

AT THE END OF THE SEASON IN 1962, I took a job with BPA (Bonneville Power Administration) in Portland. From mid-November to April, I worked setting power line towers from the Wanapum Dam toward Vantage and Ellensburg, Washington.

To get to the work site, it was quicker to go from Quincy rather than Ellensburg, so there I was.

Once design work was completed, our task was to set the location of the towers by setting a wooden hub at each leg and a point on the centerline of the transmission line showing the Engineering Station of the tower. Most of this work was not very exciting because the ground was rolling hills covered with sage brush. Then, chainman, Bob Taylor, got his big break.

It was 20 degrees outside with two feet of snow and a breeze of about 10 mph. The crew chief asked if I would like to learn how to "run the gun." "Yes. Oh yes," I replied. As I recall, it was a Gurley with the usual four brass leveling screws.

We pulled up to the tower location to be staked and I jumped out and began to kick snow away from the control point. The crew chief cracked his window and said I needed to clear the area for about five feet around the setup point. I set up the tripod, mounted the transit on it, placed it over the control point and started to level the instrument. The crew chief called me back into the Jeep to get warm. I was so excited I didn't realize I was cold. He explained to me that I would need to get the transit very close to the control point using a plumb bob. I had only used a plumb bob for chaining. He took me through the procedure and how to level by turning the level bubble on the instrument crossways to the leveling screws. Out I went.

I got the center of the "gun" over the hub and started on the leveling screws. Within ten minutes (I should have been done), I was using both hands to try to move a single screw. The crew chief then called me back to the Jeep. I'm sure it was to get warm but he began to explain the back site and angle turning process. He gave me his transit reading glass and told me not to breathe on it as it would freeze. He said when I was over the point and level, I should then set the Vernier's to zero. Another 20 minutes and I was ready.

The Chief finally got out of the Jeep. He checked my setup and the horizontal plate and then pointed me to the back site which was a pole about a quarter mile away. I turned the angle and he checked it. We were good to go. Two other chainman got out and the chief went back in the Jeep. This must have been the longest time ever taken to set four corners and the centerline of a BPA tower, but it was *MY* tower and I was hooked. I knew I would be a real surveyor someday! ⊙

The Wanapum Dam

Wanapum Dam is located on the Columbia River, six miles downstream of Vantage, Wash., 18 miles upstream of Priest Rapids Dam and 415 miles above the mouth of the river. The dam was named Wanapum in honor of the band of Native Americans who live along a stretch of the Columbia River from Vantage south toward Pasco, Wash.

Construction start: July 1959

Power generation began: July 1963

General construction contract cost: $93,277,690

Length: 8,637 feet

Maximum height from deepest excavation point: 185 feet

Spillway length: 820 feet

Number of spillway gates: 12 (each gate is 50'x 68')

Number of turbines and generators: Ten (of each) which spin at 85.7 rotations per minute.

Horsepower of each turbine: 150,000

Rated generating capacity: 1,092 megawatts

Downtown Portland, Oregon circa 1960s

#17 My First Seven Years at M.I.T.

HAVING LEFT ROSEBURG AND MR. SHANER, I arrived in the big city of Portland in 1966 and I've never left. I began my search for work in the Yellow Pages, which I thought was the way everyone did it. (1) Andy Paris & Assoc., (2) James Chase with Marx and Chase, (3) John Compton Surveying located near King City. John told me about an outfit in Beaverton (we always called companies "outfits," like ranches in Baker County) that might be hiring: Robert E. Meyer Engineering.

Off I went to REM Engineering located near the corner of Watson Avenue and Farmington Road. I talked with Bob for about 15 minutes and he then introduced me to Walter L. Caswell (Layne). We talked and he said I was hired and it would be about a week before a second crew member would arrive, Mr. Zen Dutson.

So for that week I ran blueprints through a wet process ammonia machine. I hated it when the original wrapped itself around a roller and I had to stop everything and take it apart.

It was a most interesting seven years that I worked for REM Engineering. Bob Meyer was very good at hiring newly graduated engineers (especially from Oregon State University) and giving them a start in their career. This is probably why over the years the company became known as M.I.T. (Meyer's Institute of Training.)

For a brief time Bob Meyer joined with two other engineers, Andy Klein and Carl Green, and thus became Green, Meyer, and Klein. All these men were guided by the highest ethical conduct and driven for a quality project. However, I think because of the differences in personalities it just didn't work.

Many of the people I met while at Robert E. Meyer Engineering became lifelong friends and others have left me with fond memories of our times together. Layne Caswell became one of my closest friends and I miss him very much. Others include Carl Clinton, Al Hertel, Zen Dutson, Dave Kucera, Dave Gould, Dave Sandstrom (Mr. Cool under pressure), Errol Garr, Jerry Williams, Steve Baker, and LaVola Meyer. Many others have slipped my fading memories.

After seven years, I was lured away to Wilsey & Ham by their vice-president David Evans. That is another 19 year story.

It should be noted that while at Bob Meyer's company I gained my professional license. This was largely due to Layne Caswell, night classes at PCC, and Spencer B. Gross. So I passed the examination in 1970, ten years from the time I picked up an axe for Al White. ⊙

EGAC Committee Report—January 2015

■ *Joe H. Ferguson, PLS*

The following items have been reported to me from the various chapters:

Trig Star was held again this year. The number of students taking the test has fallen by about 10%.

Fewer volunteers are stepping forward to give tests. This could be because many of the math teachers do not feel they have enough time to be involved. We also have a non-existent showing on the east side of the state.

Pioneer Chapter reports: We had a great presence at the NW Youth Career Expo in Portland. Thousands of students attended.

John Minor reports: The SW Chapter joined with the local chapter of PEO for our 10th annual dinner to help high school students in Coos, Curry and Douglas counties explore careers in surveying and engineering. We set up booths and the students and their parents came around to explore career possibilities. OIT, OSU and several junior colleges were also there to talk about curriculum and scholarships. The dinner was free for students. This year we hired a bus to bring students from Curry County up to Coos Bay.

Peter Allen reports: The Rogue River Chapter was invited to be co-presenters for a group of local realtors in Grants Pass to talk about flood elevation certificates and typical flood issues that we encounter here in our area. The event was sponsored by Umpqua Bank. The speakers included a local insurance agent, a bank representative, Todd Zeutzius, PLS (from my office), and myself.

It was very successful, informative, well accepted and generated a lot of questions.

Greg Crites reports: I did a joint presentation entitled "Clearing Title" with Alan Brickley, chief counsel for First American Title at the IRWA Symposium on May 14, 2014.

Jon Aschenbach reports: Although it might only be slightly related to surveying, I have been an active member of the Cascade Pacific Council (of the Boy Scouts) Timber Committee. Our first goal is always to promote safety in the scout camps relative to the surrounding timber stands. After safety, we look at opportunities to harvest timber to provide money for the council. The Cascade Pacific Boy Scout Council has several hundred acres of Boy Scout Camps in Northwest Oregon and Southwest Washington; including some incredible timber stands.

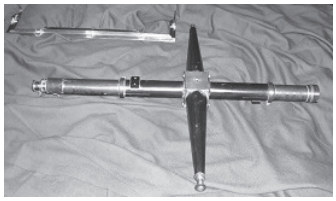
Whenever the committee meets, we frequently talk about finding "lost" property corners. Whenever harvesting occurs, the property lines are well established.

Pat Gaylord reports:

- I taught the Surveying Merit Badge to two scouts.
- Taught general Map and Compass skills (including how to use the public land survey system on a map) to 30 scouts and five adults.
- Taught a portion of the Engineering award to 15 Cub Scouts (presented to them about surveying and how to measure property lines).
- Promoted TwiST to numerous teaching friends, but got no takers on attending this year.
- I also believe that Paul Landau was involved in Engineering Week activities this past year.

I am sure that Mason Marker, Gary Anderson, Tim Kent and Lee Spurgeon have much more to add to this endeavor. ⊙

Surveyors nationwide donating to help "A Gift to the Nation"



■ *From the NSPS*

Is this the most historically-significant surveying instrument in America? Mason & Dixon's astronomical transit, used on the five-year colonial survey of Maryland, Delaware and Pennsylvania following the French & Indian War is being restored to its full original condition.

The transit is a masterpiece of science and technology by English instrument-maker John Bird in 1760. All that remains today of Mason & Dixon's 'Transit and Equal Altitude Instrument' are its telescope, trunnions and striding level in deteriorated condition. The optics are cloudy. Missing completely are the instrument's original mounting cradle, degree-rings, rotating shaft, adjusting mechanisms and other crucial parts.

The remnant pieces are owned by the National Park Service and kept on the second floor of Independence Hall—seldom displayed, on a far back table. Following Mason & Dixon, in 1784 David Rittenhouse and Andrew Ellicott used the instrument in western Pennsylvania—the last 'field job' it ever saw.

The finest experts in America are completely restoring the transit. Its 'milky' optics are being repaired, and all missing parts are being reconstructed by hand. To keep costs down, most of the craftsmen are donating their skills and time, charging only for materials.

October 8, 2015: 250th Anniversary of the Mason-Dixon Survey

The restored instrument will be unveiled Oct. 8, 2015 at the Maryland Historical Society in Baltimore during a celebration of the 250th Anniversary of the Mason-Dixon Survey.

- Contributors will have their names memorialized in a leather bound book entitled "A Gift to the Nation" which will be displayed at Independence Hall.
- All contributors will receive extensive recognition for their donation.
- Society-level contributors and Sponsors will receive admission to the celebration in October 2015.

For more information contact:
David S. Thaler, PE, LS dsthaler@dsthaler.com
Chas Langelan, LS clangelan@comcast.net

At least $25,000 must be found from private sources to pay for this restoration. A non-profit NSPS support group, "The Friends of Independence National Historical Park," has been trying since September to raise the money. Tax-deductible private donations are sought from individuals and organizations.

Contributions have been coming in from surveyors all across the country. Several professional organizations have made substantial donations, among them the Surveyors Historical Society (SHS), the District of Columbia Association of Land Surveyors (DCALS), the Maryland Society of Professional Engineers (MSPE) and the Maryland Society of Surveyors (MSS), but the goal is far from reached.

Once completed, the beautifully-restored instrument will become part of the main public display at Independence Hall, shown to thousands of visitors from around the world. All donors' names will be inscribed in a large leather book, to be permanently displayed with the transit.

The book will be entitled, *A Gift to the Nation* because that's what this effort is.

Instead of neglected parts on a back table, the country will once again have Mason & Dixon's original historic transit, completely restored and prominently displayed on a correct authentic tripod...a gift from the land surveyors of America to our nation.

Please consider making a tax-deductible donation if you haven't already. Every contribution is appreciated, acknowledged, permanently recorded, and greatly needed. Thank you for helping. ⊙

» DONATION FORM ON PAGE 14

Learn more online

Restoration of the Bird Transit
www.mdspe.org/?BirdTransit

The Mystery of the Transit in the Tower
By David S. Thaler, L.S.
www.surveyorshistoricalsociety.com/MysteryTower.php

The Friends of Independence National Historical Park
www.friendsofindependence.org

Maryland Historical Society | Museum and Library
www.mdhs.org

A Gift to the Nation

Donation Form - Please Help Save Mason & Dixon's Transit

Name: _____

Mailing Address: _____

_____

_____

Phone: _____

Email: _____

Exact Name of Donor, as you Wish it to be Permanently Inscribed in the Leather-bound *"Gift to the Nation"* Memorial Book: _____

Enclosed is my Check in the Amount of: $ _____

(Please make checks payable to: **The Friends of Independence National Historical Park)**

☐ $5,000: The Mason-Dixon Society ☐ $1,000: Sponsor ☐ $250: Friend ☐ Other

☐ $2,500: The Rittenhouse Society ☐ $500: Donor ☐ $100: Supporter

Thank You for Donating to Help Preserve Mason & Dixon's Transit!

Please mail this form with check payable to:
The Friends of Independence National Historical Park
To the following address:

Save Mason & Dixon's Transit
P.O. Box 47428
Baltimore, Maryland, 21244-7428

The Epic Survey of Mason and Dixon

Two hundred and fifty years ago, a pair of English surveyors came to the New World to resolve a fierce boundary dispute. The result was an incredible scientific and engineering achievement.

■ *By David S. Thaler, P.E., F.NSPE*

Reprinted with permission from the March 2014 issue of *PE magazine*, published by the National Society of Professional Engineers

More than two centuries ago, two English surveyors arrived in America to help settle a long-raging boundary dispute between the colonial proprietors of Maryland and Pennsylvania. Charles Mason and Jeremiah Dixon's epic five-year effort was the first geodetic survey in the New World and would turn out to be the greatest scientific and engineering achievement of the age.

Their story begins with Sir George Calvert, who was the secretary of state to King James I of England. For his loyal service to the crown, he was given the title of Lord Baltimore and granted land in the Americas, which he named Maryland in honor of Queen Henrietta Maria.

The royal charter granted Lord Baltimore all the territory from the Atlantic Ocean "unto the true meridian of the first fountain of the River Potowmack" and from the south bank of the Potomac River to include all land "which lieth under the Fortieth Degree of North Latitude."

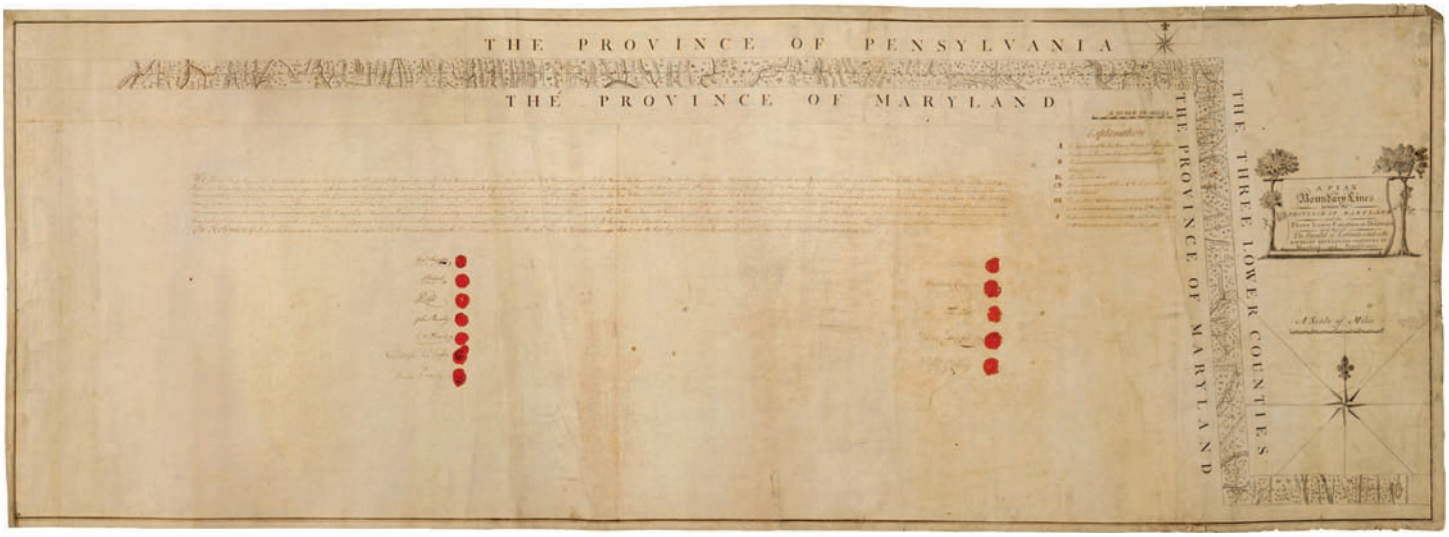
The other players in this drama were members of the Penn family. Sir William Penn had been a distinguished admiral in the Royal Navy who had loaned the profligate King Charles II the then-stupendous sum of 16,000 pounds sterling. In exchange for discharging the debt, his son, also William, was granted the province of Pennsylvania. Penn's charter granted the land from the 42nd parallel of latitude down to the 40th parallel, excluding a 12-mile circle around the town of New Castle in what is now Delaware.

So Calvert, the proprietor of Maryland, was granted from the Potomac up to the 40th parallel and Penn, the proprietor of Pennsylvania, received from the 42nd down to the 40th parallel to where it intersected a circle, 12 miles from New Castle. But the question was, "where was the 40th parallel?"

Unfortunately for the proprietors, the maps at the time were based on the exploration of the Chesapeake region by Captain John Smith in 1608, and the Smith map showed the 40th parallel too far south. In fact, the 40th parallel of north latitude does not intersect a 12-mile circle around New Castle but lies much farther north. It was this discrepancy that set off the granddaddy of all boundary disputes, which raged for more than 80 years.

The dispute was so bitter because the stakes were high. There were about 4,000 square miles of territory in question, and Philadelphia, which had been settled at the limits of

» continues on page 16 »



MS 174, DOCUMENT 1051 MASON DIXON MAP

Mason-Dixon Map. Credit: Maryland Historical Society

» THE EPIC SURVEY OF MASON AND DIXON, from page 15

navigability of the Delaware River, lay about five miles south of the actual 40th parallel. Depending on the location of its border, Pennsylvania could have lost both Philadelphia and its critical access to the sea and ability to resupply.

Finally pressed by the king's council, in 1732 the parties entered into an agreement. They decided that the boundary should run 15 miles south of Philadelphia (the east-west line), west from Cape Henlopen on Fenwick Island to the midpoint of the Delmarva peninsula (the transpeninsular line), and then north to intersect a tangent with the 12-mile arc around New Castle (the tangent line). This was not a good deal for the Calverts, as it placed the boundary about 19 miles south of the true 40th parallel. The controversy raged on.

The parties could not come to a resolution, and finally in 1735 the Penns filed a complaint in the English courts that became known as the Great Chancery suit. The case was litigated over 15 years at enormous expense, until in 1750 a decision was rendered.

The southern boundary of the lower three counties of Pennsylvania (now Delaware) would be at the latitude of Cape Henlopen, and the peninsula would be divided equally. The center of the 12-mile circle would be measured as a radius from the center of New Castle (which was agreed to be the dome of the courthouse), and the east-west line would run at a constant parallel of latitude, 15 miles south of the southernmost point of Philadelphia.

The proprietors engaged local surveyors who started with the transpeninsular line in April 1751. They began on Fenwick Island and ran their line across the peninsula from the "verge" of the Atlantic Ocean to the Chesapeake Bay. Although swamps and dense vegetation made work on the line difficult, the colonial surveyors were able to find and mark the midpoint of the peninsula, which became the southwestern corner of what is now Delaware.

The colonial surveyors next tackled the task of running the tangent line, which ran from the midpoint of the peninsula to the point of tangency with the 12-mile circle around New Castle. This was a lot harder than it looked on paper given that the line was more than 80 miles long, the terrain difficult, and the equipment poor.

The geometry of the corner was also very complex. An 83-mile-long line would have to be run to just graze the 12-mile circle at a perfect 90 degrees. This would then have to be run north to intersect another line exactly 15 miles south of Philadelphia.

The colonial surveyors ran their line from the midpoint of the peninsula due north until it was within the 12-mile radius. Then they measured from the dome of the courthouse, but their first attempt was a half mile too far east.

Two other attempts were too far west. As the task seemed beyond the capability of the local surveyors, the Penns and the Calverts consulted the Astronomer Royal, who recommended Charles Mason and Jeremiah Dixon. Dixon was an experienced surveyor from County Durham, England, and Mason had been an assistant at the Royal Observatory in Greenwich. They had worked together on the Transit of Venus observation of 1761, an international scientific effort to determine the distance from the earth to the sun and the size of the solar system—burning questions of the 18th century.

Mason and Dixon entered into a contract with the proprietors and arrived in Philadelphia on November 15, 1763, to begin work.

They brought with them two state-of-the-art instruments specially commissioned by the Penns for the task. The first was a zenith sector, the most advanced instrument for determining latitude of its day. It had a six-foot telescope mounted over a protractor scale used to determine latitude by measuring the angles of reference stars from the zenith in the sky. They also brought a transit and equal altitude instrument that determined true north by tracking stars where they crossed the meridian.

Mason and Dixon also used other instruments, including a Hadley Quadrant, an octant used in celestial navigation that can measure angles up to 90 degrees, and an astronomical regulator, a pendulum clock in a tall case.

The men began their historic task at the southernmost point of Philadelphia, the north wall of a house on Cedar Street (now under the bed of I-95).

From complex astronomical observations, Mason and Dixon determined their latitude to be 39°56'29.1" N. This became the reference for the east-west line, which would become the Maryland-Pennsylvania border, and was 15 miles due south from their starting point.

Because going the required 15 miles due south to start the east-west line would have taken them across the Delaware River and through the Province of New Jersey, the surveyors decided to proceed west 31 miles, to the farm of John Harland in what is now Embreeville, Pennsylvania, or as they put it, in the "forks of the Brandywine."

In the spring of 1764, they set off exactly 15 miles due south to a point where they set an oak post, which they called the "Post Mark'd West in Mr. Bryan's field" near what is now Newark, Delaware. This was to become the starting point of the famous west line and the reference point for the rest of the survey. As it was used as a base for the calculations that followed and is mentioned almost daily in their journal, it is the most significant point in the survey.

» continues on page 18 »

» THE EPIC SURVEY OF MASON AND DIXON, from page 17

After setting the Post Mark'd West, Mason and Dixon then headed south to the middle point of the peninsula that had been previously marked by the colonial surveyors. Following a convenient star, they ran a dead straight line 83 miles from the midpoint, a feat that had never been accomplished before. By measuring their error at the end and proportioning it back along the length of the line, they were able to set the tangent line. They measured the angle at the tangent with their Hadley Quadrant, and the angle measured a perfect 90 degrees. Mason and Dixon had successfully found the solution that had eluded the colonial surveyors.

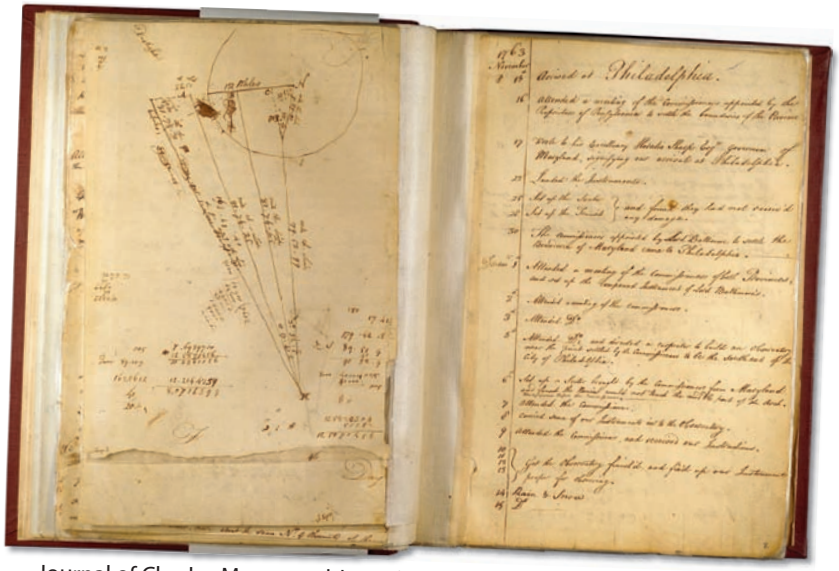
In March 1765, a year and a half after their arrival, they returned to the Post Mark'd West to begin the monumental task of running the west line. Off they went, hacking their way through the primal forests of western Maryland. They travelled in wagons, the delicate instruments atop a feather mattress. As they went, Mason and Dixon set boundary stones. Mile stones were marked "M" on the Maryland side and "P" on the Pennsylvania side, and they set "crown stones" every five miles with the coat of arms of the Calverts on one side and the seal of the Penns on the other.

After nine months of work on the west line, they had proceeded 117 miles, 12 chains, and 97 links from the Post Mark'd West. (Like other surveyors of their day, Mason and Dixon measured with a chain that had been standardized at 66 feet and was divided into 100 links.) They stored their instruments, returned back east to the Harland Farm where they spent the winter, and then resumed in the spring.

On June 18, 1766, Mason and Dixon reached the Allegheny Mountains, which was the frontier—the western limit of English sovereignty and the beginning of Native American control. Negotiations with the Indians proceeded slowly, but finally, greased by a payment of 500 pounds sterling, a treaty was signed and permission secured to proceed beyond the Alleghenies.

In July 1767, the Indians dispatched three Onondagas, eleven Mohawks, and an interpreter to guide the survey party, which had now grown to 115 men. Early in October, the party crossed Dunkard Creek, where they encountered the Great Warrior Trail. This was one of the most important Indian trails in the country, running from New York to South Carolina. The Indians' chief informed the surveyors that the trail "was the extent of [his] commission from the Chiefs of the Six Nations and that he would not proceed one step further westward."

Mason and Dixon continued on and extended their line an additional 250 feet to the top of the next ridge, Brown's Hill. After the surveyors set up a tall post and a conical mound at 233 miles, 17 chains, and 48 links from the Post Mark'd West, the Mason-Dixon line came to an end.



Journal of Charles Mason and Jeremiah Dixon, 11/15/1763 to 09/11/1768

Having finished their work, Mason and Dixon returned to Philadelphia, where they drew a map of their survey. Two hundred copies were printed.

The magnitude of Mason and Dixon's accomplishment is almost impossible to imagine. They spent nearly five years in America, living in tents and enduring searing summers and frigid winters. Today, we use GPS to calculate a latitude in minutes. It took Mason and Dixon two weeks of celestial observation and complex hand calculations to accomplish the same task.

Long before chain saws were invented, they used hand axes to clear a vista 16 feet or so wide and more than 330 miles long. Their line has been resurveyed many times, and the accuracy that they achieved, given the technology of their day, continues to astound.

Mason departed for home on September 11, 1768, the work complete. He wrote in his journal "at 11h 30m A.M. went on Board the Halifax Packet Boat for Falmouth. Thus ends my restless progress in America."

Dixon returned to his family and surveying practice in County Durham, where he died in 1779. Mason returned to America in 1786 with his wife and eight children. He died shortly thereafter and is buried in an unmarked grave in the Christ Church burial ground in Philadelphia.

However, the surveyors' line lived on.

In 1820, Congress adopted the Missouri Compromise and first used the term "Mason-Dixon line" to describe the Maryland-Pennsylvania border. States north of the Mason-Dixon line were to be free, and those south slave states. And so in addition to being the first geodetic survey in the New World and one of the greatest scientific and engineering achievements of all time, the Mason-Dixon line became an icon—the dividing line between slavery and freedom. ⊙

David S. Thaler, P.E., F.NSPE, is president of D.S. Thaler and Associates Inc., a civil and environmental engineering firm in Baltimore. A Fellow of the American Society of Civil Engineers and a licensed surveyor, he is also a guest scholar at the University of Baltimore School of Law, where he lectures on land use.

BLM Public Land Survey Plats

■ *Submitted by Mary J.M. Hartel, BLM, Chief, Branch of Geographic Sciences*

The following public land survey plats for Oregon were approved and/or filed during the period of Feb. 2014–Sept. 2014. This list is also available electronically by contacting the BLM, Oregon State Office at khensley@blm.gov.

Oregon, Willamette Meridian

T. 8 S., R. 4 E.	Dependent Resurvey and Subdivision of Sections 2 & 11
T. 17 S., R. 11 E.	Dependent Resurvey and Subdivision of Sections 3, 4, & 10
T. 20 S., R. 8 W.	Dependent Resurvey
T. 34 S., R. 5 W.	Dependent Resurvey
T. 28 S., R. 11 W.	Dependent Resurvey
Tps. 38 & 39 S., R. 6 E.	Dependent Resurvey and Subdivision of Section 4
T. 5 S., R. 4 E.	Dependent Resurvey
T. 8 S., R. 2 E.	Dependent Resurvey
T. 37 S., R. 3 E.	Dependent Resurvey
T. 3 S., R. 6 W.	Dependent Resurvey
Tps. 26 & 27 S., R. 10 W.	Dependent Resurvey
T. 28 S., R. 8 W.	Retracement
T. 29 S., R. 4 W.	Retracement
T. 7 S., R. 3 E.	Dependent Resurvey
T. 38 S., R. 2 E.	Dependent Resurvey
T. 5 N., R. 44 E.	Dependent Resurvey, Subdivision of Section 25, & Survey
T. 2 S., R. 44 E.	Dependent Resurvey and Subdivision of Sections 28, 33, & 34
T. 29 S., R. 9 W.	Retracement
Tps. 15 & 16 S., R. 12 E.	Dependent Resurvey and Subdivision of Sections 5, 6, 8, & 9
T. 15 S., R. 12 E.	Dependent Resurvey and Subdivision of Sections 25, 28, & 35
T. 2 S., R. 7 E.	Dependent Resurvey
T. 14 S., R. 16 E.	Dependent Resurvey and Subdivision of Section 28
T. 32 S., R. 4 W.	Dependent Resurvey and Subdivision of Section 5
T. 18 S., R. 7 W.	Retracement
T. 11 S., R. 1 E.	Dependent Resurvey and Subdivision of Section 29
T. 12 S., R. 1 E.	Dependent Resurvey
T. 22 S., R. 25 E.	Dependent Resurvey and Subdivision of Section 10
T. 15 S., R. 2 W.	Dependent Resurvey
T. 32 S., R. 19 E.	Dependent Resurvey
T. 14 S., R. 16 E.	Survey of New Lots 5 & 6
T. 21 S., R. 9 W.	Amended Field Notes
T. 2 S., R. 43 E.	Dependent Resurvey and Subdivision of Section 12
T. 19 S., R. 9 W.	Retracement
T. 13 S., R. 12 E.	Dependent Resurvey and Subdivision of Section 17
T. 37 S., R. 2 E.	Dependent Resurvey and Subdivision of Section 33
T. 15 S., R. 12 E.	Dependent Resurvey and Subdivision of Sections 29, 30, & 32
T. 17 S., R. 17 E.	Dependent Resurvey
T. 6 S., R. 2 E.	Dependent Resurvey

Lost Surveyor

■ *Pat Gaylord, PLS*

Question: Can you name the Oregon highway and bridge location?

Answer:

Lost Surveyor

The bridge pictured is the **Rex T. Barber Veterans Memorial Bridge** on **Highway 97** between Madras and Terrebonne. It was completed in 2000 and was the first bridge in the U.S. to be constructed using cast-in-place segmental construction methods. It is one of three bridges spanning the Crooked River Gorge at this location. The bridge is named for Colonel Rex Barber, an Oregonian, and decorated WWII Army Air Corps ace who is credited with shooting down Japanese Admiral Isoroku Yamamoto (the architect of the Japanese attack on Pearl Harbor) during a top secret mission in 1943. Colonel Barber died in 2001 in Terrebonne. He received many decorations during his time in combat including achieving Ace status (with five or more confirmed kills), the Navy Cross, two Silver Stars with oak leaf cluster, Purple Heart and numerous Air Medals.

The 1926 brass disk is located on the Crooked River (High) Bridge which was the original highway bridge and was completed that same year. The bridge was designed by renowned Oregon Department of Transportation bridge engineer Conde B. McCullough who is best known for his designs of many Oregon coastal bridges. The Crooked River (High) Bridge is located just downstream from the Barber Bridge. It is now a pedestrian bridge, offering great views of the river canyon and the railroad bridge (was completed in 1911) which also crosses the Crooked River Gorge in this area. The Crooked River (High) Bridge is the site of one of the most heinous and notorious murders in Oregon's recent history. The crime led to the only death row conviction of a woman in Oregon. That sentence was later commuted to life in prison and she was then paroled in 1985.

Located at the south end of the bridges is Peter Skene Odgen State Scenic Viewpoint. Peter Skene Odgen led a colorful, and, at times, violent life as a fur trader and explorer for Northwest Company and Hudson's Bay Company. In 1825, Ogden led a Hudson's Bay trapping party through the area. His business dealings and adventures led him to explore much of British Columbia and the western U.S. which now includes parts of seven states. In 1847 Odgen, working on orders from the Hudson's Bay Company, negotiated the release of 49 settlers who were held by the Cause and Umatilla Indians after the Whitman massacre near Walla Walla. He eventually retired to Oregon City, Ore. where he died in 1854. He is interred at the Mountain View Cemetery in Oregon City.

Check out these sites on your next trip along Oregon's Highway 97.

PROFESSIONAL LISTINGS

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