Volume 27: Issue 3
July, 2016

LINES & POINTS

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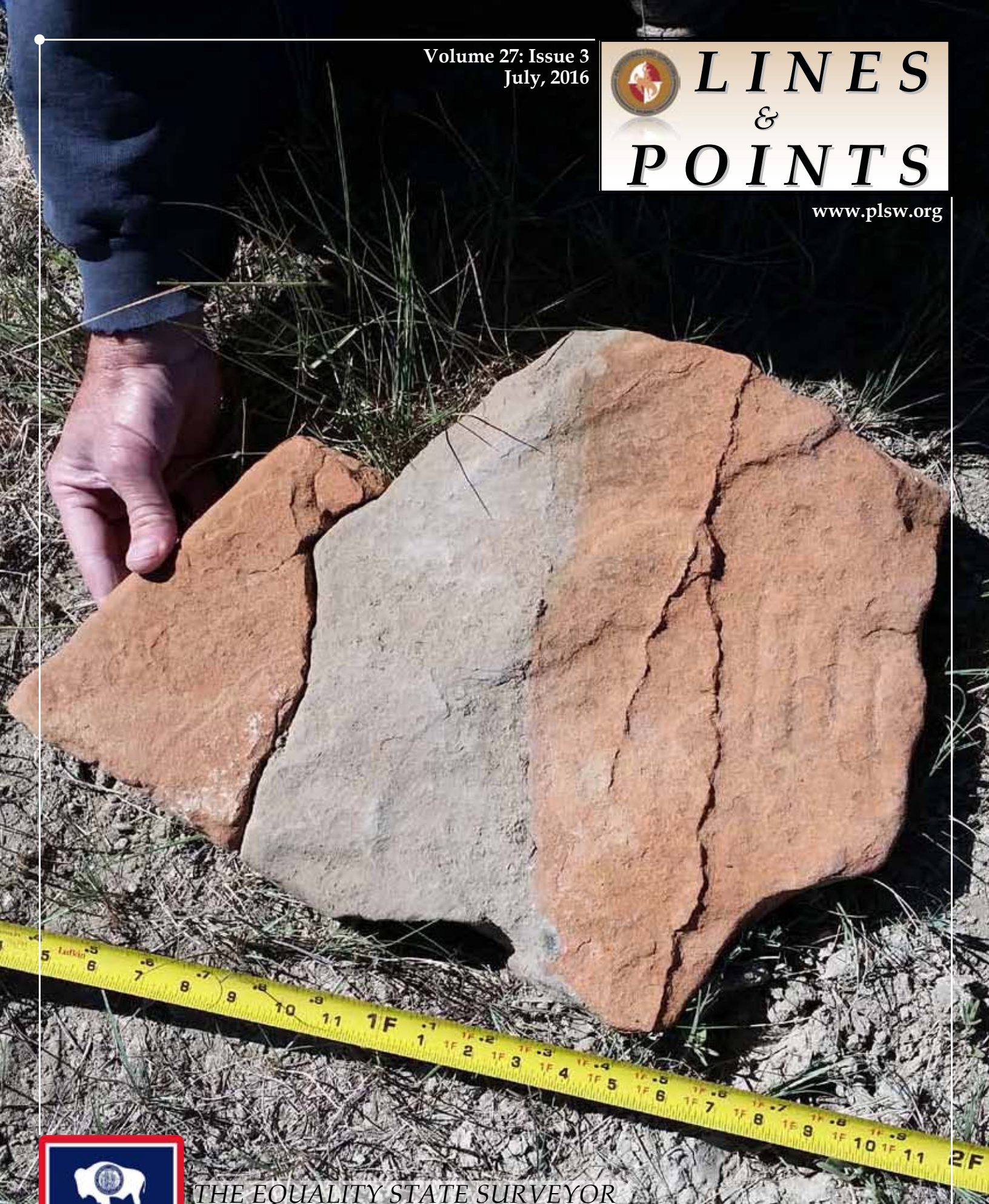

THE EQUALITY STATE SURVEYOR

PROFESSIONAL LAND SURVEYORS OF WYOMING

Publications Committee

On The Cover

Pieced Together Proof photo by: Schmalz & Klemperer

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- John Baffert - Surv-KAP, LLC
- Chris Farnsworth - RDO Integrated Controls
- Kelly Goff - Underground Consulting Solutions
- Susan Hall - Trimble
- Tim Klaben - Berntsen International Inc.
- Troy Langston - Monsen Engineering

PLSW (Professional Land Surveyors of Wyoming; PO Box 725, Afton, WY 83110) is a statewide organization of Land Surveyors registered to practice in the Equality State of Wyoming. PLSW is dedicated to improving the technical, legal, and business aspects of surveying in the State of Wyoming. PLSW is affiliated with the National Society of Professional Surveyors (NSPS) and the Western Federation of Professional Land Surveyors (WestFed).

Advertising Information

Digital-ready, full-color advertising with payment should be mailed to Lines & Points, P.O. Box 8, Cheyenne, WY 82003.

Advertising rates are as follows:	Year	Issue
Full Page	$810	$210
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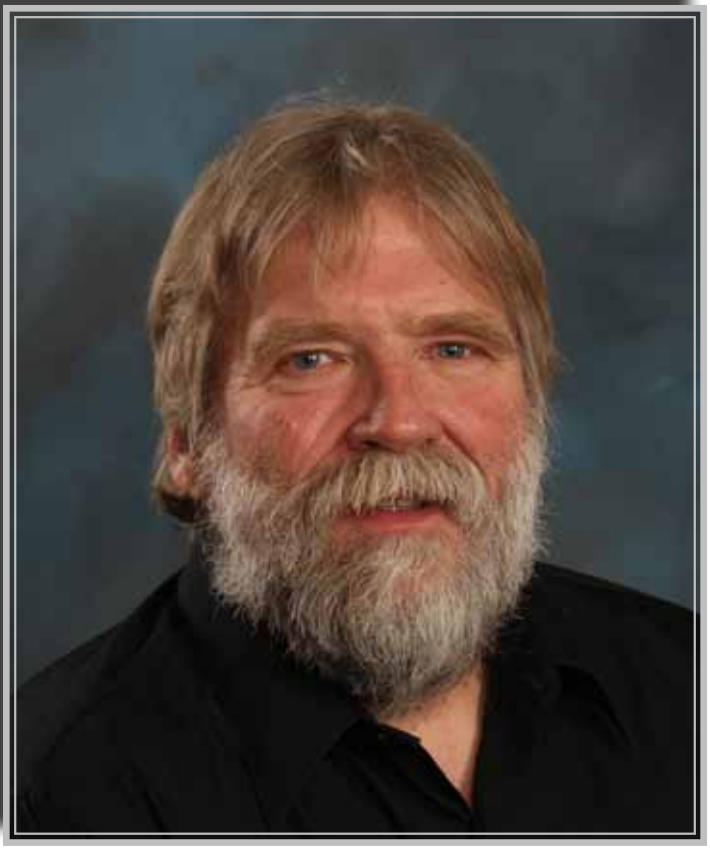
Employment	Free	Free

Special Rates apply for PLSW Chapters and cover placements.

For more information please contact Jack Studley.

PRESIDENT'S MESSAGE



Greetings, Fellow members and associates of PLSW:

Hopefully winter has finally lost its grip on us and we have been able to move forward with those projects that have been eagerly awaiting to start. Here in Fremont County we have had no choice but to yield to an unusually high amount of runoff from snowpack and spring showers bringing forth more mud than normal. Last I heard, the area was about twice the normal precipitation for this time of year. With Fremont County not being exclusive, I know that areas in the entire state have had more than their share of unusual weather events. It is great to see more green along the highways headed into the summer months.

Many topics were discussed at the last Board of Directors meeting in May. Directors were encouraged to get feedback from their Chapters regarding the monument destruction bill and report at the next meeting. This proposed legislation was sent to interim committee last session in order to fine tune the wording and to hopefully gain support from PLSW. Also discussed was the thought of recording or filing survey plats at the county level. Discussions took place quite a few years ago regarding this subject and were discontinued due to opposition by other agencies. Personally, I hope that we will get support from our members and the other agencies to move this forward to fruition.

Recently I received information in the mail encouraging participation for the WES Project of the Year. There have been few entries in the survey category over the years, all of which have been worthy, but there could always be more. Reading through recent survey publications, it is doubtful that there would be a project such as creating a message on a dry lake bed in Nevada that would be readable by an astronaut on the International Space Station, or setting up monitoring points to measure the velocity of glaciers in Pakistan or undertaking a monster cadastral survey in Alaska just when you thought you would be retiring. But, what may be considered a normal everyday survey may be worthy of entering. It could be a boundary retracement in one of the many Independent Resurveyed areas found throughout Wyoming, an ALTA/NSPS Land Title Survey with an unusual boundary/ownership situation, retracement of Mineral Surveys or right-of-way retracement surveys. Just some thoughts, I know there is more.

This past April, several young aspiring to be registered land surveyors made history by being the last to take the NCEES survey examination using a No. 2 pencil and an answer sheet. Although some may compare this to retiring the transit, steel tape and plumb bob, which it really is, it only makes sense that the testing process, like technology, becomes more modernized and streamlined. No more waiting weeks or months to get results, as NCEES states that results will be posted within 7-10 days. There is a good article in the June issue of American Surveyor of what the NCEES does.

Unfortunately, I addressed this same sadness in my last message and certainly hope that it will not have to be addressed again for many years. Paul Campbell's life was taken unexpectedly on April 8, 2016. Paul, too, spent the majority of his life as a Professional Land Surveyor and represented our profession honorably. He will be missed.

June 11 was the day that the Surveyors of the Sixth Principal Meridian met at the Initial Point near Mahaska, Kansas. If an article is not found in this issue, there should be something found in the October issue of Lines and Points.

As we are all experiencing difficult times with the downturn in the economy, we have had to make adjustments in our day to day business model. It seems like most have reduced staff to maintain positive cash flow. Hopefully we are not reducing our costs drastically in order to stay in business. We as Professional Land Surveyors deserve to charge and receive fees that are worthy of our professional registration. It's better to be called the most expensive surveyor in the country while keeping a steady backlog of work rather than being the low cost provider that performs poorly and inefficiently.

Be safe at work and home and take the time to do the things outside of work that you work to live for. Spend time with family, friends and enjoy what you enjoy doing. Life is too short to miss fulfilling your bucket list. Have a great summer!

Randy Stelzner, P.L.S., CFedS
President, Professional Land Surveyors of Wyoming

ANNOUNCEMENTS

Congratulations!

The members of the Professional Land Surveyors of Wyoming would like to recognize the achievement of the following new Wyoming registrants:

Darby Schock, Cheyenne, WY LS 15432
Sheila Slocum, Gillette, WY LS 15442
Joshua Philips, Missoula, MT LS 15443
Theron Weston, Evanston, WY LS 15444

The Wyoming Engineering Society

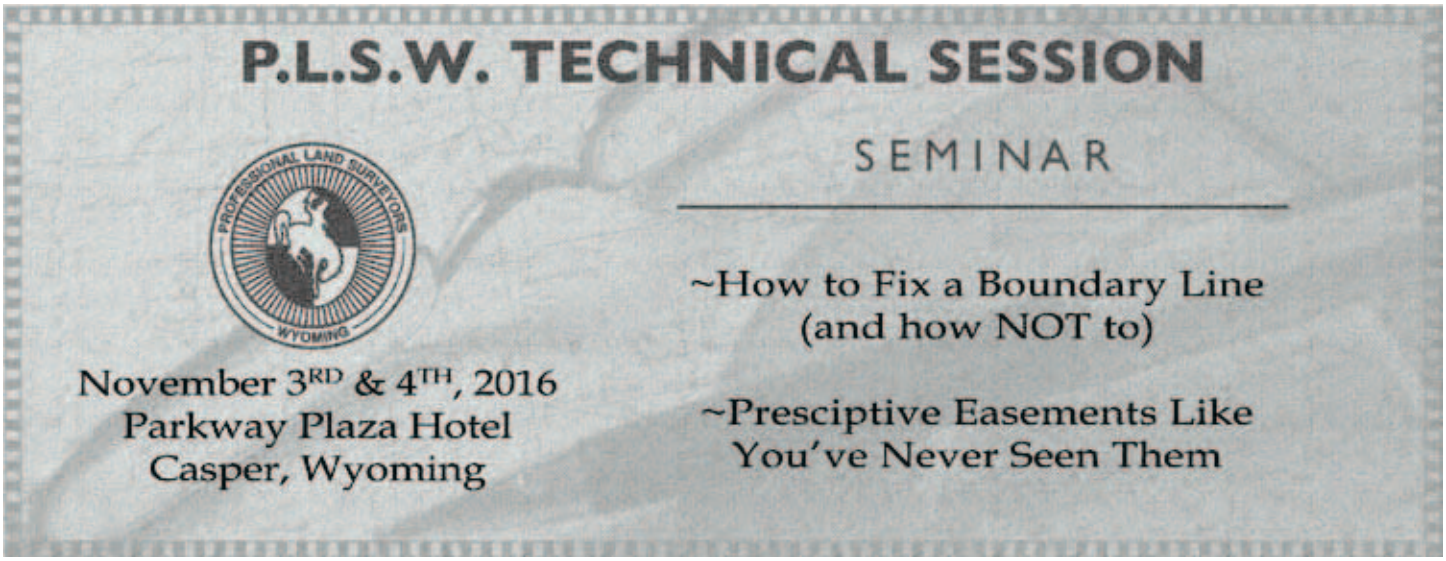
2016 President's Project of the Year Award.

The guidelines for submission of a project may be found at:
www.eng.uwyo.edu/societies/wes

Entries must be received in Laramie on or before Friday, January 6, 2017.

Lines and Points Article Rotation Submission Schedule By Chapter

Responsible Chapter	First Call Date	Last Call Date	Publication Date
Laramie Valley Chapter	Thank You!! (see "Where was the stone originally set?" in this issue)		
Upper Platte Chapter	September 1	September 15	October 1, 2016
Southwest Chapter	December 1	December 15, 2016	January 1, 2017
Northeast Chapter	March 1	March 15	April 1, 2017
Northwest Chapter	June 1	June 15	July 1, 2017
West Chapter	September 1	September 15	October 1, 2017
Central Chapter	December 1	December 15, 2017	January 1, 2018



Kristopher M. Kline, president of 2Point, Inc., has a four-year degree (class of '84) in General Science from Bridgewater College located in Bridgewater, Va. He has been involved in the surveying profession since graduation.

Kris became licensed in North Carolina in1991 (P.L.S. L - 3374). He is a 1999 graduate of the North Carolina Society of Surveyors (N.C.S.S.) Institute, a three-year continuing education program that for many years drew national attention for the quality of its curriculum and instructors. Kris served for 3 years as Chairman of the N.C.S.S. Education Committee.

In 2001, Kris began offering continuing education courses in North Carolina on legal aspects of retracement. More recently, his teaching career has expanded to include conferences and seminars nationwide. Course offerings now include a broad range of topics, including adverse possession & other unwritten rights, riparian law, mineral rights and courtroom preparation. Customized courses tailored to the jurisdiction in which they are presented enhance their value to the professional. Kris has presented several keynote addresses for state conventions.

In 2011, he established "Unmistakable Marks," a new column published in "Point of Beginning" a trade magazine for surveying professionals. Kris presently submits bi-monthly articles for the magazine, with over 30 articles published to date. These articles are written for a national audience and generally focus on various legal aspects of boundary retracement.

In August 2013, Kris published his first book "Rooted in Stone: the Development of Adverse Possession in 20 Eastern States and the District of Columbia." This text considers adverse possession and prescriptive easements from their early origins to the present day. Separate chapters are dedicated to variations between jurisdictions in the eastern United States.

His second book, "Riparian Boundaries and Rights of Navigation" includes extensive discussion of the many definitions of the term "navigable." This short volume was completed in 2015 and focuses on property rights along smaller rivers, streams, lakes and estuaries. It considers the inevitable confusion that results when modern definitions are applied to early grants and the effects of subsequent legislation on riparian rights.

How to Fix a Boundary Line (and how NOT to)

This course examines various legal mechanisms which courts apply in order to fix the location of a disputed or uncertain boundary line or easement. Topics include: Adverse Possession (in depth, approximately 4 hours), Boundary by Estoppel, Conditional and Consentable Boundary Lines, Practical Location, Parol vs. written agreements, and Part Performance of Oral Contracts. A short segment on the doctrine of Merger is also included.

Prescriptive Easements Like You've Never Seen Them

While the basic concepts behind prescriptive easements are widely recognized, many developments in this area of the law are fairly recent. The course begins with the development of the Lost Grant Theory and its relationship to prescriptive rights in the United States. The various elements required for the creation of a prescriptive easement are discussed in detail. Tacking and claims by (and against) the state are considered, along with the scope & location of the resulting easement. This class also considers court rulings for prescriptive easements associated with: Parking Areas; Subterranean and Visible Utility Easements; Light and Air; Trees and Shrubbery.

Paul Richard Campbell

10 February 1942

-

8 April 2016

Paul Richard Campbell was born 10 February 1942 to Allan and Esther Campbell in Cody, Wyoming. Paul was the youngest of eight children. He attended Eastside Elementary School and Cody High School. In high school he excelled in football and basketball. During high school, Paul earned the nick name "Trainer", which is attributed to encouraging his high school teammates to refrain from partying and remaining in physical shape for competitive athletics.

After high school graduation, Paul attended Northwest Community College (1960 - 1963) earning an Associate of Arts & Sciences degree. Between 1963 - 1965 and 1969 - 1970, Paul studied civil engineering at the University of Wyoming. Between October 1967 and December 1968, he was a field and office surveyor at Livingston Engineering (Donald Livingston, P.E. & P.L.S.) in Cody. From June 1969 through September 1970, Paul performed similar assignments for the Wyoming Department of Transportation (under Robert P. Black at Laramie).

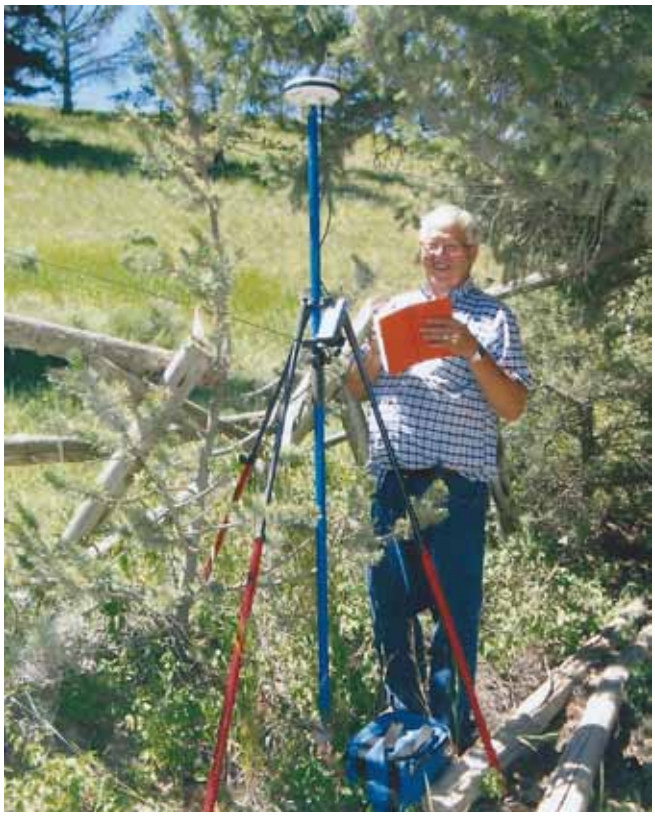
In October 1971, Paul joined Christian, Spring, Sielbach & Associates (Billings, Montana) as a survey party chief and later as Field Supervisor-Office Manager. His assignments included control surveying, boundary surveys, subdivision design/layout, and legal research. It was during this period that Paul was the survey project manager for a real estate development (Forbes Trinchera Ranch Subdivision) in Colorado that he executed the surveys for a subdivision of over 2,000 lots and 535 miles of roads and streets.

On 28 August 1975, Paul was awarded professional land surveyor registration by Colorado (No. 13460). On 6 April 1977, Paul applied for professional registration in Wyoming. He was awarded his registration on 12 July 1978 (No. 2571). Subsequently, Paul became a registered professional land surveyor in Arizona, Montana, and Nevada. Paul founded Campbell & Associates in 1978. At the time of his death he was associated with Sage Civil Engineers.

In April 1983, Paul married Linda Alsup. He was preceded in death by his parents, stepfather Bob Vawter, and three brothers: Albert; Dean; and William. Besides his wife, Linda, Paul is survived by siblings Donna Cody (Meeteetse); Barbara Lundvall (Cody) James (Powell); and Ora Mae Gonzales (Gardnerville, Nevada).

Paul was a long time member of the Professional Land Surveyors of Wyoming and the Northwest Chapter. Paul actively participated in the PLSW and WES functions. It was at these functions that this writer had the opportunity to exchange "war stories and topical banter" about our activities since we had last met. Paul was past-president of the Cody Lions Club; a life member of the Elks Club; and an active member of the Glenn Golf and Country Club (his handicap is unknown).

During Paul Campbell's career he greeted you with a smile and a warm hand shake. He offered his resources and assistance. Paul's passing has left a void of professional-social-congeniality which will be sorely missed.



Author: Herbert W. Stoughton, P.E., P.L.S., C.P.

National Surveyor's Week
~Outreach Highlights~

In conjunction with the Wyoming Board of PE's and PLS's, PLSW has begun an outreach program for young kids from grade school age to high schoolers, presenting what the surveying profession does. The program is in its infancy, but several people have met with cub scouts, girl scouts and boy scouts in several cities in the State.

The contacts and arrangements for the presentations was conducted entirely by the WBPEPLS personnel. I would like to thank Shannon Stanfill, Troy Niesen and Krista Wilson for all of their efforts in making the contacts. I know from personal experience that it is not easy to get that foot in the door.

Krista has also put many of the events on the Board's Facebook page, and has received very positive feedback. It began with Engineer's Week, then Shannon approached us about doing the same sort of outreach with the surveyors. She was able to get a proclamation before Governor Mead to proclaim March 21-26 as Wyoming Land Surveyor's Week. An PLSW outreach committee was formed and added comments, revisions and pictures to brochures the Board prepared for handing out to the various groups.

There were four presentations to groups in Cheyenne, one in Laramie, one in Wheatland, and even an entire day at Casper. A special thanks to Brad Neumiller and Chris Kashmitter for spending their day with the boy scouts at Merit Badge University in Casper. The boy scouts have had a surveying merit badge for a very long time, and it is difficult to get enough interest in assisting with it to make it happen.

Laramie Boy Scouts

Cheyenne Girl Scouts

Merit Badge University, Casper

Also, thanks to all the other volunteers who have given presentations: Vince Cavanaugh, Jack Studley, Jeff Jones, Dave Hammond, Joel Ebner, Suzie Sparks and John Lee. Geno Ferrero is also working with the junior college in Rock Springs on the "Roadmap to STEM" later this year. The Board and myself will also have a presence at the STEM gathering in August at the University of Wyoming.

The outreach committee consists of Lyle Casciato, Dean Raynes, Geno Ferrero, Olian Shockley and Doug Boyd. Others have been contacted in other areas of the State and will hopefully be able to join in as the summer busy-time winds down.If I omitted any individuals who have been involved, it was unintentional, and I thank all who have participated.

It is a pleasure to watch the kids during the presentations, and see the ones who are fascinated beam as we demonstrate some of the equipment we use, scans that have been completed, old monuments and maps, and to see the amazing understanding of some of the complexities of surveying that some of these young people have.

I look forward to the continued effort in this direction; to generate interest in young people for the surveying profession. Thanks, again, to all who have volunteered their time to share some of our interesting experiences with, hopefully, the next generation of surveyors.

Mark Corbridge

Webelo Pack- Dildine Elementary, Cheyenne

CLARENCE KING & The Great Diamond Hoax

by Mary M. Root, LS

During the summer of 1872, rumors began circulating around San Francisco about the next big thing – the purported discovery of a diamond field. Amid the West's mineral abundance a diamond deposit seemed plausible, as did the story of two prospectors stumbling upon the find. Although the story eventually proved too good to be true, many people were taken in by the carefully crafted hoax, including bankers, financiers, generals, a United States Senator, and a reputable jewelry firm. The damage to fortunes and reputations would have been far worse if not for the hoax's discovery and exposure by geologist and surveyor Clarence King.

The grifters were two cousins from Kentucky, Philip Arnold and John Slack. Arnold had worked around various mining operations for years and had served as an assistant bookkeeper for the Diamond Drill Company, and knew the industry. With that knowledge and a sack of uncut gems purchased abroad, Arnold and Slack began their scheme. Arriving at the Bank of California's San Francisco branch, the two men asked for their valuables to be placed in the vault. "Before he locked up the sack, the cashier found that it contained several hundred uncut diamonds and many raw rubies, sapphires and emeralds. Someone had discovered a fabulous gem mine," wrote Harry Crosby in American Heritage Magazine.

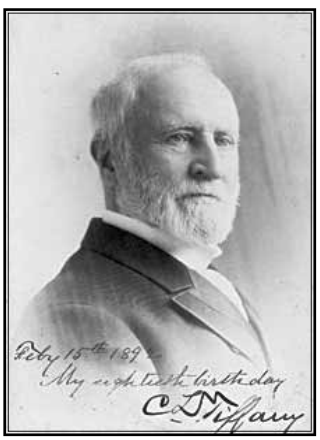
Philip Arnold and John Slack

Soon, bank director William C. Ralston became involved. Arnold and Slack agreed to Ralston's request to send a mining expert to their discovery, but stipulated that the expert be led blindfolded to the site in order to preserve secrecy. Several weeks later, the expert returned with more uncut jewels and his report that diamonds were "jutting out of the ground and gleaming in crevices." Still cautious, Ralston asked that samples be submitted to Tiffany & Company of New York, the nation's leading experts in precious stones. Again, Arnold and Slack agreed. Excitement grew in San Francisco when Ralston filed incorporation papers for the new firm "San Francisco and New York Mining and Commercial Company." The firm's Board of Directors were big names in the fields of finance, mining, law, and government. Senator Benjamin F. Butler was enlisted to help expedite the proposed mining claim on federal land through Congress. New York lawyer Samuel Barlow arranged the appraisal with Tiffany.

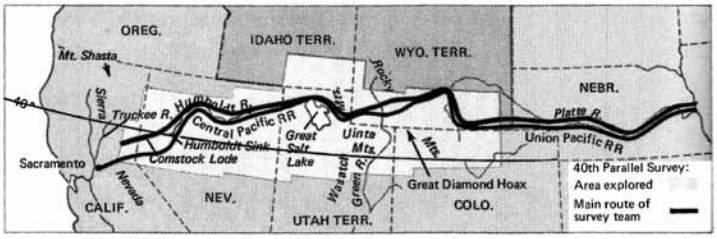
William Ralston arrived in New York with a sample of Arnold and Slack's gems. Witnesses to the appraisal included editor of the New York Times Horace Greeley, George B. McClellan, Benjamin Butler, and other potential investors. Charles Tiffany examined the gems before declaring, "These are beyond question precious stones of enormous value," and then asked for two days examination time from his lapidary department. When they reassembled at the appointed time, "Tiffany stated firmly that, when cut, the gems would be worth $150,000."

Knowing that the appraised gem sample represented just ten percent of the find, Ralston was elated. Returning to California, he organized an initial stock offering, and paid Arnold and Slack a reported total of $600,000. Ralston also hired a respected mining expert, Henry Janin, who was to verify the gem field. Poor Janin! He, too, was escorted to the site blindfolded by Arnold and Slack, after a long train trip followed by a trail ride of two days. Once at the diamond field, the fraudsters never let Janin out of their sight, and whenever any questions arose, managed to divert Janin's attention or quickly salt a spot Janin was about to explore. Janin's subsequent report concluded, "I would say that I consider this a

William C. Ralston



Charles L. Tiffany



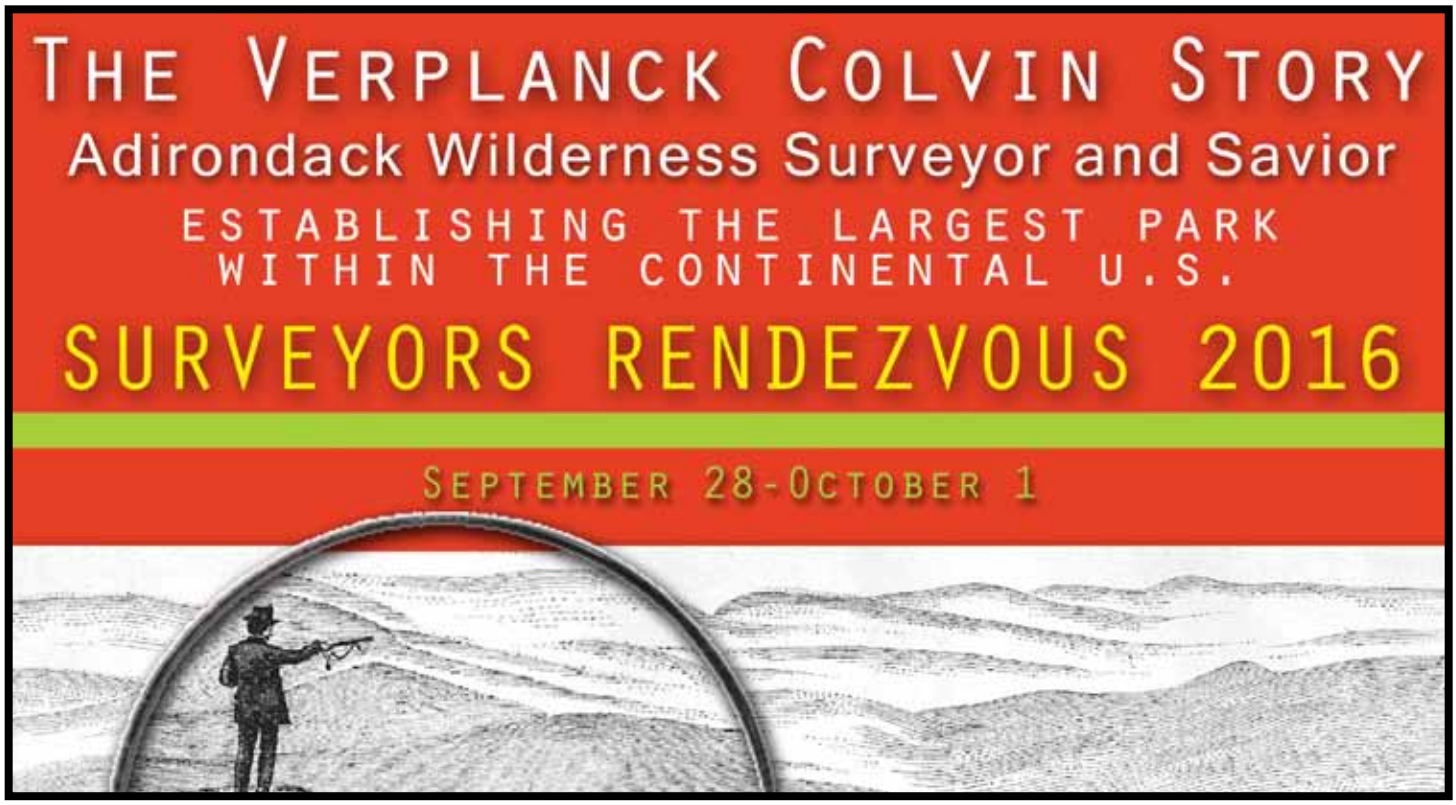
For the 40th parallel survey King covered a 100-mile-wide zone flanking the railroad. The scientists were 10 examine and describe the geological structure, geographical condition and natural resources. The false gemstone field was near the spot where the borders of Wyoming, Colorado, and Utah meet.

wonderful discovery; and one that will prove extremely profitable; that while I did not have time enough to make the investigations which would have answered very important questions, I do not doubt that further prospecting will result in finding diamonds over a greater area than is yet proved to be diamondiferous; and finally, that I consider any investment at the rate of forty dollars per share or at the rate of four million dollars for the whole property, a safe and attractive one."

Meanwhile, the most prominent field geologist of the day was studying the ancient glacier system of the High Sierra, directing survey teams in Nevada and Wyoming, and working with a draftsman to develop a shading method for his topographic maps. Clarence King was nearing completion of the 40th Parallel geological atlas and his summary volume Systematic Geology. He would later write "I had been so absorbed with the legitimate work of the Exploration during the summer, that it was quite impossible for me to devote any attention whatever to the consideration of the reported diamond discovery." But by October 1872, with Janin's report being quoted in the newspapers, King finally realized his geological reputation might be at stake. "If the story was true, the prospectors had come across something King and Gardiner had missed in five years of exploration."

Clarence King reached the geological survey's San Francisco office on October 18th, meeting Samuel Emmons, George Gardiner, and Allen Wilson. First, the location of the secret diamond field must be discovered.

King went to Henry Janin and gleaned two clues: that the sun had been in his face during his blindfolded two-day ride, and that the gem field lay upon a mesa near pine timber. Next, the four geologists spent time in the gossip corridors of San Francisco, subtly rounding up any fact that might lead to the location. Gardiner even managed to chat with Ralston's civil engineer. King and Gardiner felt that the find might be in the Tertiary beds of Vermillion Basin. From the other incidental clues "as to water supply for washing, timber, lay of the



land, and various other things that would mean nothing to the ordinary individual," along with their extensive knowledge of the land itself, the team was able to "place the field within a fifteen-mile radius." Now it was late October and mountain travel would be difficult, but King "determined to go there."

Wishing to disguise their mission, Wilson and Emmons set off by train to Fort Bridger with King following one day later. Gardiner stayed in San Francisco to work on the atlas. In freezing cold, King, Emmons and Wilson rode 150 miles from Ft. Bridger to the suspected diamond field 7,000 feet above sea level. They advanced, King wrote, "with terrible marches to Green River Canyon, making a ford at Browns Park, and then headed up the forlorn cleft which Fremont had called Vermillion Canyon." Elation took the place of cold once they found a water notice nailed to a tree, claiming the water right of the stream, and signed by Henry Janin. They rode on, and came to "a shelf of coarse limestone which jutted out from the imposing mesa. It was bare and swept by wind and stained with iron, but here all the tracks converged." Samuel Emmons wrote, "We began examining the rock on our hands and knees, and in another instant I had found a ruby. This was indeed the spot."

Darkness soon fell, and the three went to sleep that night believing the find was real. The next day, however, the geologists gradually became suspicious. There was a disturbing regularity in the ration of diamonds to rubies. Then, doubts were increased when a diamond appeared in an unlikely place, perched on a rock, as King wrote, "directly on top, in a position from which one heavy wind or the storm of a heavy winter must inevitably have dislodged it." The next day they began a systematic investigation. They sieved the earth around the knob where the lone diamond was perched and found nothing. Where nearby earth was disturbed, siftings revealed "amethysts, emeralds, sapphires, garnets and spinels – an unheard of combination in nature," wrote Emmons. Examining anthills, they discovered traces of small holes as if "made by a stick pushed through the crust." Rubies were found in those pierced anthills, along with the "storm-worn footprints of a man." On their fourth and last day at the site, the men dug deep pits where geologic knowledge told them diamonds might be, but nothing was found. Now they were convinced the whole thing was a swindle. While Emmons led the pack train back to Ft. Bridger, King and Wilson rode forty-five miles across country to the nearest train station and set out for San Francisco.

King broke the news to Henry Janin, and they both went to Ralston and the other investors to reveal they had been victims of fraud. The group sent one more expedition to the site to confirm King's report and found he was right. The San Francisco and New York Mining and Commercial Company was officially dissolved. Ralston refunded the money each early investor had staked, but was ruined financially. Arnold and Slack had already fled the area; neither man was ever prosecuted for the crime. Embarrassed, Charles Tiffany had to admit he was only familiar with cut and polished diamonds. Henry Janin came out all right, thanks to King's sympathy to his plight when writing his report, and the two remained friends.

Clarence King al Uinta Lake ca. 1868; photo by Timolhy O'Sullivan

After the San Francisco Chronicle broke the story of "The Great Diamond Fiasco" in November 1872, Clarence King was hailed as a national hero and dubbed "The King of Diamonds." Seven years later, King would become the first director of the U.S. Geological Survey.

Sources:
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Previous publication: *BACKSIGHTS* V342, Fall 2015

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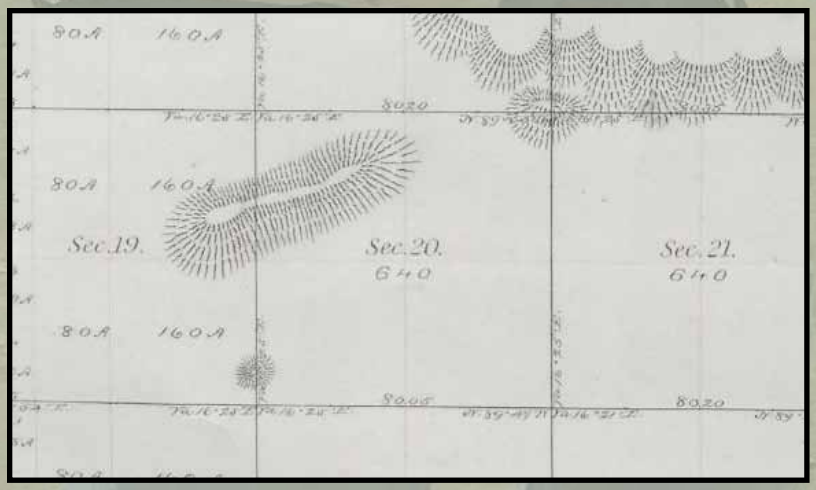
As surveyors, many of us have found corner section sections corners that seem out of position from the original setting. But how often have we found proof that it was moved from its original location? In July 2015, Paul Klemperer and Brian Schmalz, professional licensed surveyors (PLSs), had an opportunity to do just that.

History

This is a story of retracement, of walking in the footsteps of Deputy Surveyor Edwin James, , who in 1871, surveyed Township 20 North, Range 73 West, in what is now Albany County, Wyoming. He, along with his chainmen, Thomas Stark and Joseph Twaddle, axeman John Evans, and flagman James Goldsberry worked on a landscape that has seen minimal change in the 145 years that have passed. In the summer of 2015, we surveyed six sections in the area over the course of a couple days. While surveying the project, it was easy to picture these men, long gone, using horses instead of ATVs, a solar compass instead of a global positioning system (GPS), cursing the wind, and carving the stones that would lay untouched for generations.

Located on a private ranch 30 miles from Laramie, this Township has rarely been surveyed since the original subdivision. Although this survey included the recovery of many original stones, the focus of this story is on the southeast corner of Section 20 (Figure 1).



(Figure 1: GLO map of Section 20, 1871)

The United States Geological Survey (USGS) completed their survey for the "Sybille Springs" quad map in 1955 and located many of the section corners, including the southeast corner of Section 20. Upon review, it appears that this stone was moved before the 1955 Quad map survey as suggested by the bearing break between the Southwest corner of Section 20 and the

Where was the stone originally set?

The monument has moved...prove it.

By Brian Schmalz, PLS &
Paul Klemperer, PLS

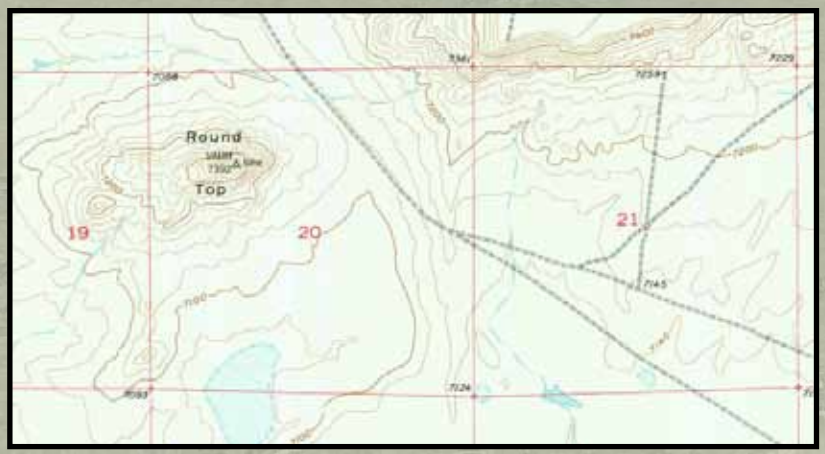
southeast corner of Section 21. (The bearing break is more evident when the adjacent south quarter corner of Section 20 and south quarter corner of Section 21 are plotted at their found location [Figure 2].)

A 1958 survey for the McGill Bridge Road (then a County Road), was completed by W.E. Grenier, who was an Albany County Engineer and Surveyor at the time. In 1982, Grenier recorded a corner record for the Southeast corner of section 20 from this 1958 survey. Grenier had a reputation for completing corner records for corners he found before the corner recordation act.

Evidence

When locating the southeast corner of Section 20, we found the "perfect classic stone" set upright just north of an old east-west fence (Photo 1). The notches were correct with two on the south and four on the east, leaving little doubt that this was the original stone. We also noticed that there was a large bearing break from the south quarter corner of Section 20 that we had just surveyed. We hadn't surveyed to the west yet, but it occurred to us that we had not yet located the correct position for the south quarter of Section 20; especially since the north face of this stone was weathered, there was no scribed "1/4," and it was located some distance north of the east-west fence. Therefore, we made another trip to this stone and looked for more evidence, but concluded that this stone was likely in its original position.

During the course of the survey we found many original stones and some of the quarter corners that apparently hadn't been visited since they were set in 1871. With a little luck and persistence, almost every section corner and quarter corner in the project area were recovered. With this original evidence, and the fact that our measurements were relatively close to record, our confidence in Edwin James' survey increased.

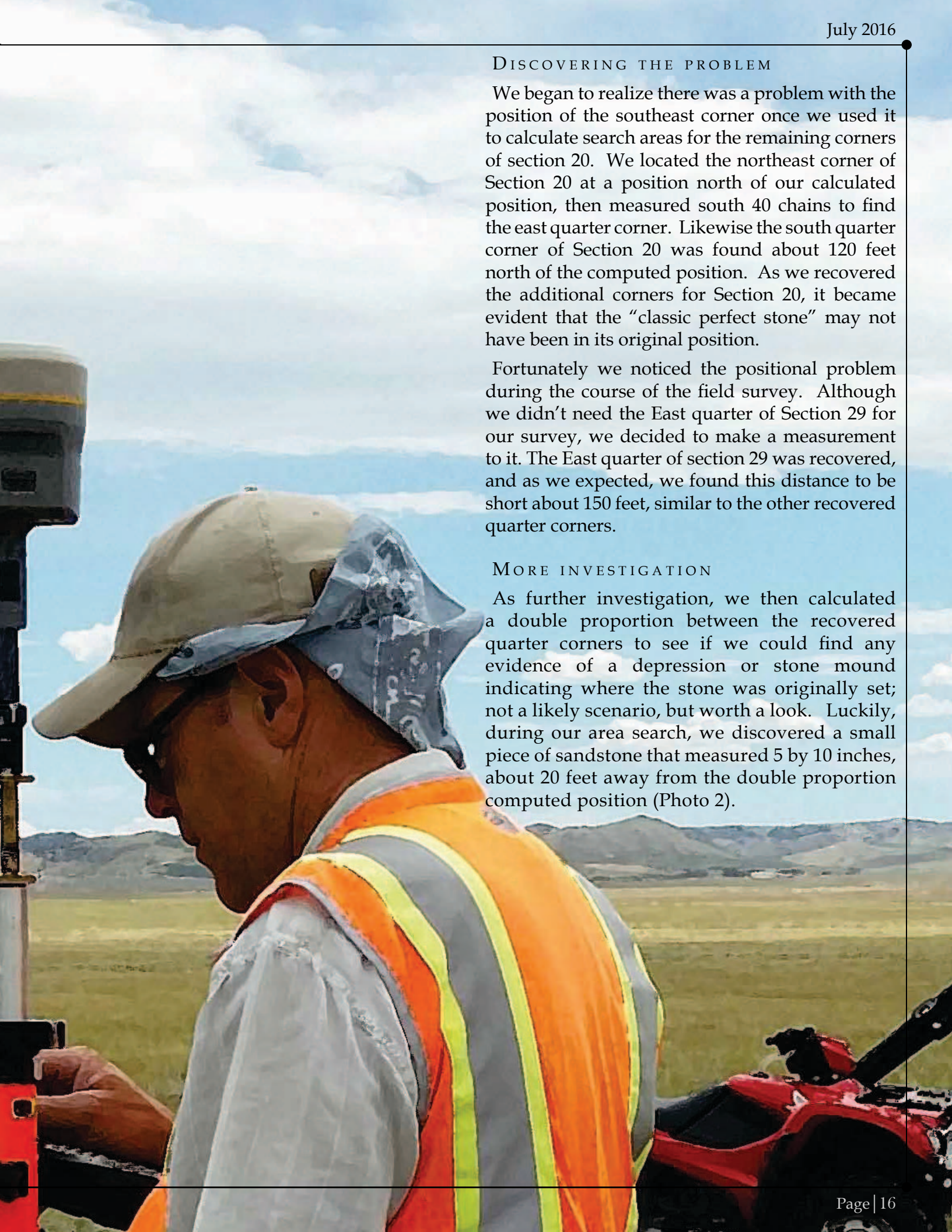


(Figure 2: 1955 Quad map, Sybille Springs)

Photo 1: Found position, SE Corner Section 20

Photos 2: Recovered portion of stone monument sandstone markers

Photo 3: Sandstone piece matched to set stone monument



Discovering the problem

We began to realize there was a problem with the position of the southeast corner once we used it to calculate search areas for the remaining corners of section 20. We located the northeast corner of Section 20 at a position north of our calculated position, then measured south 40 chains to find the east quarter corner. Likewise the south quarter corner of Section 20 was found about 120 feet north of the computed position. As we recovered the additional corners for Section 20, it became evident that the "classic perfect stone" may not have been in its original position.

Fortunately we noticed the positional problem during the course of the field survey. Although we didn't need the East quarter of Section 29 for our survey, we decided to make a measurement to it. The East quarter of section 29 was recovered, and as we expected, we found this distance to be short about 150 feet, similar to the other recovered quarter corners.

More investigation

As further investigation, we then calculated a double proportion between the recovered quarter corners to see if we could find any evidence of a depression or stone mound indicating where the stone was originally set; not a likely scenario, but worth a look. Luckily, during our area search, we discovered a small piece of sandstone that measured 5 by 10 inches, about 20 feet away from the double proportion computed position (Photo 2).

Proof

There was minimal sandstone in the search area, so we marked the position, carried the stone piece to the set stone near the fence line, dug up the set stone, and compared the two. It was immediately clear that the two pieces of sandstone had at one time been a single piece. The small piece of stone that we found near the double proportioned position matched like a puzzle piece the larger stone set about 148 feet south (Photo 3). Here was the proof that the stone had been moved.

The piece of stone we found may not have been in the perfect original location, but it appeared to be the best evidence of its original position relative to the adjacent recovered corners. So, we went to work. We drove a rebar in the center of the depression until it was near flush with the ground (Photo 4), dug a hole to the east side of the rebar large enough to set both pieces of stone (Photo 5), placed a 2 ½ inch aluminum cap (marked per the manual) on the rebar, and built a collar of stone around the cap (Photo 6).

Although we can only speculate as to why the stone was moved; our theory is that an owner or ranch hand noticed the stone, recognized what it was, and moved it near the fence line. The logic may have been that moving the stone 148 feet to the fence would be a lot easier than moving one or two miles of fence.

This project reminded both of us why surveying is our chosen profession. Like kids on a treasure hunt, it was almost comical to see us jump out of the truck or off the ATVs to search for these stones. This project offers insight as to why we surveyors' love to retrace the original GLO survey, mixing history, technology, geology, and detective work with a bit of good luck.

Photo 5: Burying the stones alongside the rebar

Photo 4: Rebar set at recovered portion of stone monument

State of Wyoming Corner Record

(In compliance with the *CORNER PERPETUATION AND FILING ACT*, Wyoming Statutes, 1997 Section 33-29-140 et. seq., and the Rules and Regulations of the Board of Professional Engineers and Professional Land Surveyors)

Record of original survey and citation of source of historical information (if corner is lost or obliterated). Description of corner monumentation evidence found and/or monument and accessories established to perpetuate the location of this corner. Sketch of relative location of monument, accessories, and reference points with course and distance to adjacent corner(s) (if determined in this survey).

Original Record: (Edwin James - 1871) Set a sandstone 24 x 10 x 5 for corner to sections 20, 21, 28, & 29

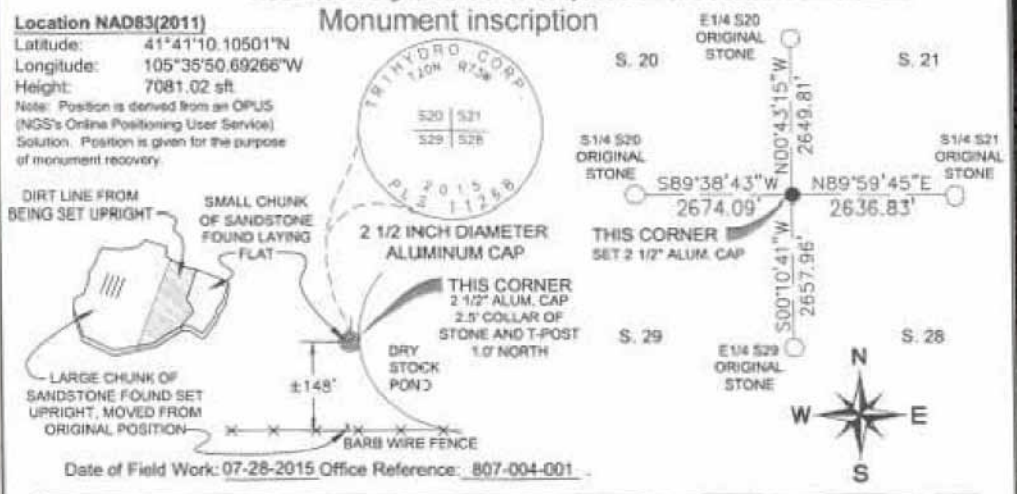
Subsequent Record: Corner record by W.E. Grenier PE&LS 371 dated January 1982 work done Sept. 1958.

Evidence Found: Found sandstone, well set, measures 15" x 2" x 14" projects 8" above ground. The stone is marked with 4 notches on the east and 2 notched on the south. The stone was set under an east-west barb wire fence. After measuring to the original quarter corners in all four directions; we rejected this stone for position. A computed double proportion position led us to find another small chunk of sandstone measures 6" x 11" x 2" laying on its side about 148' north of found stone at fence. We placed the two sandstones together and they fit perfectly, showing that they are part of the same sandstone. We accepted the location of the small sandstone as the best evidence of the original corner position, and it appears that the larger chunk of sandstone was moved sometime after the 1958 survey referenced above. See below for illustration.

Perpetuation: At the center of the center of the found smaller chunk of sandstone, we set a 24" x 5/8" rebar with a 2 1/2" aluminum cap marked as shown below, cap projects 0.2' above ground. We built a 2.5' diameter collar of stone around the cap and set a T-Post fence post 1.0' north. We buried the original stone evidence upside down on the east side of monument.

Location NAD83(2011)
Latitude: 41°41'10.10501"N
Longitude: 105°35'50.69266"W
Height: 7081.02 sft.
Note: Position is derived from an OPUS (NGS's Online Positioning User Service) Solution. Position is given for the purpose of monument recovery.

Monument inscription



Date of Field Work: 07-28-2015 Office Reference: 807-004-001

Cross Index Plat

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

This corner record was prepared by me or under my direction and supervision.

BRIAN L. SCHMALZ
PLS 11268

Trihydro CORPORATION
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Laramie, Wyoming 82070
www.trihydro.com
(P) 307.745.7474 (F) 307.745.7729

Corner Name SE Sections 20, T 20 N, R 73 W, 6th P.M. Cross-Index No.: R-9

Photo 6: Stone collar around cap (Inset)

Geodetic Surveying: Part IX

Ferdinand Rudolph Hassler and the U.S. Coast Survey: Part 1

Herbert W. Stoughton, PhD, PELS, CP

Prior to 1800, the only geodetic operation in North America was the measurement of the short meridional arc by Charles Mason and Jeremiah Dixon, sponsored by the Royal Society, in conjunction with the demarcation of the boundaries between colonial possessions of the heirs of William Penn (Pennsylvania and Delaware) and the heir of George Calvert (Lord Baltimore) (1763 - 1767). The determination would be a minor contribution to determine the size and shape (form) of the earth's reference ellipsoid.

By 1775, the mapping organizations in Europe and their principal colonial possession fully understood the importance of a "rigid" survey network of triangles and traverses needed to create a unified mapping program. Some of the early programs and their major players have been introduced in earlier chapters of this "History".

On 7 October 1770, in Aarau, Switzerland, Ferdinand Rudolph Hassler was born. At the age of 16 he entered public administration in Bern. His academic studies included jurisprudence and surveying. At that time he met and worked with Professor Johann Georg Tralles (15 October 1763 - 19 November 1822). Their assignment was to execute a typographical survey of the Canton of Bern. In 1793, Hassler went to Paris, and studied under Jérôme Lefrancois de Lelande (11 July 1732 - 4 April 1807); Jean-Charles de Borda (4 May 1733 - 19 February 1799); Jean Baptiste Joseph Delambre (19 September 1749 - 19 August 1822); and Antoine Lavoisier (26 August 1743 - 8 May 1794). Hassler returned to Bern. In 1798, France invaded Switzerland, and Hassler returned to his birthplace. He held several public offices, including Attorney General of Switzerland. On 1 February 1798, Hassler married Marianne Gaillard. They had nine children between 1799 and 1816. In 1803, the French assumed control of all geodetic work in Switzerland.

In 1805, Hassler was unable to work under the French regime, and emigrated with his family to the United States. In his personal library and instruments was an Iron Committee Meter (a duplicate of the official French Prototype Archive meter) given to him by Professor Tralles. Hassler soon became active in the American Philosophical Society (Philadelphia) beginning on 6 December 1805. U.S. President Thomas Jefferson was president of the American Philosophical Society at the time. It is said that Hassler brought a scientific library of over 3,000 volumes. Two important members of the Society were Professor Dr. Robert Patterson and Mr. John Vaughn (also spelled Vaughan). When, in 1806, Hassler began selling portions of his scientific library and standardized weights and measures, the Society purchased some of the volumes, and Vaughn purchased the weights and measures. When Hassler was appointed superintendent of the Office of Weights and Measures, Vaughn loaned to Hassler these standards for comparisons.

In 1806, Dr. Patterson, Director of the Philadelphia Mint, wrote President Jefferson (3 March 1806) concerning Hassler and the positive impression he made on the Society, and included an autobiographical sketch of Hassler. Vaughn wrote a letter to Jefferson (20 December 1806) mentioning that he, Vaughn, possessed the standards, and was attempting to have Hassler survey "York Island" and up the Hudson River to Albany, for the "Corporation of New York". The ultimate goal was to measure a degree of latitude. Hassler became ill and the "Corporation of New York" changed. The survey was never conducted.

On 10 February 1807, Congress enacted legislation authorizing "to cause a survey to be taken of the coasts of the United States, . . .". After correspondence with Dr. Caspar Wistar of the Philosophical Society, Jefferson directed Swiss-born Secretary of the Treasure Albert Gallatin to advertise to "all scientific men in the United States asking for plans for bringing a survey of the coast into effect" (25 March 1807). Twelve responses were received by the committee of the American Philosophical Society, chaired by Dr. Patterson. On 21 July (according to Hassler) or 23 July (according to a secondary source), Dr. Patterson contacted Hassler, who was teaching

(Continued on Page 23)

From the Gathering at the Initial Point of the 6th P.M.

June 11, 2016

There were approximately 30 people present for the event. Approximately 20 surveyors and 10 geocachers. The Nebraska association displayed several old survey instruments and equipment and the Kansas association set up table with the site layout sketch asking for input into the restoration and refurbishment of the site.

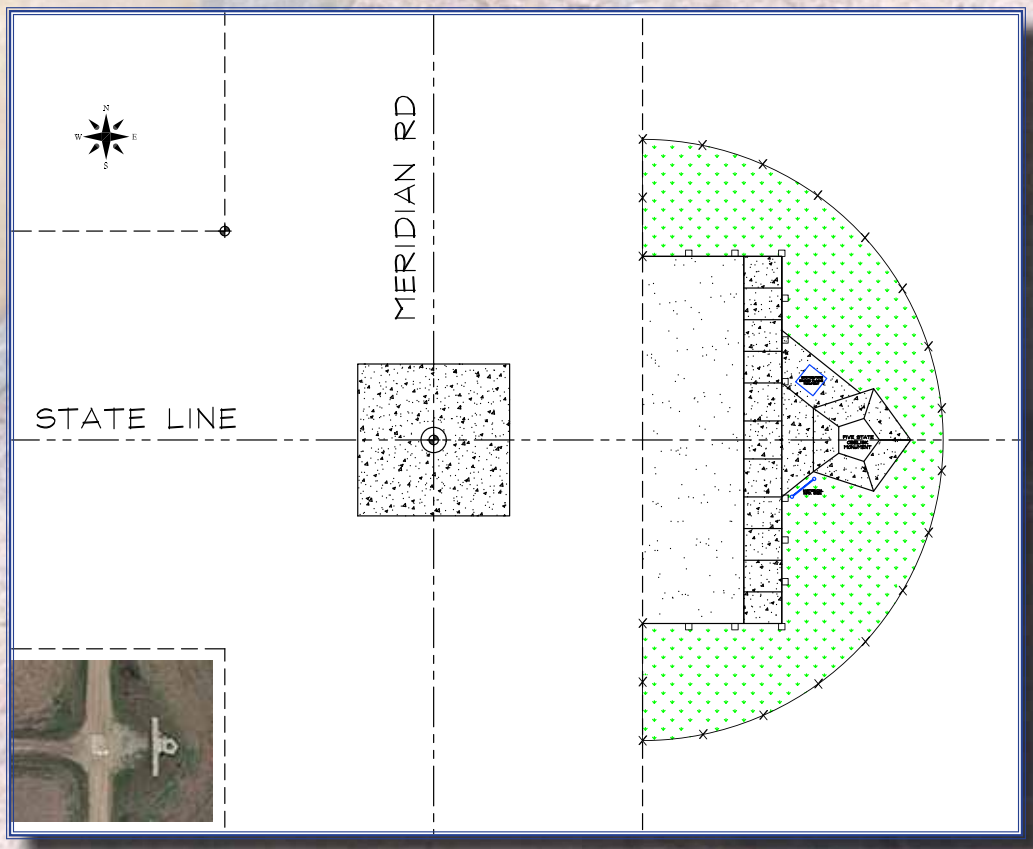
After a time of social interaction with one another, Dick Elgin, Survey Equipment Historian and attendee gave an impromptu presentation on the Burt's Solar Compass, which was probably similar to the instrument Charles Manner used to established the 6th PM Original monument. After this presentation the surveyors present gathered at the Site Sketch table to discuss ideas about the restoration and refurbishment of the site. Many ideas were presented, those ideas included: Planting of State Trees around the site from each of the five States affected and involved in the original monumentation, to asphalt the parking and intersection area to prevent the covering of the concrete pad and manhole identifying the location of the original marker, create shirts and caps to commemorate the site and used for fund raising, Pave the entire semi-circle around the granite obelisk and information signs with bricks which will have the donors name imprinted on them, install surveillance cameras for security and vandalism monitoring, remove and clean original donor's bronze plaque and replace fencing with wrought iron fencing.

The group would like to work towards this restoration to be complete and ready for a commemorate event on June 10th, 2017, the thirty year anniversary of the 1987 original dedication event. The idea was also presented to name this effort as being organized by the "Surveyors of the 6th PM - 2nd Generation".

Ken Johnson

KSLS - Historical Committee Chair


11/04/2005


MERIDIAN RD
STATE LINE

(Continued from Page 20)

at West Point (14 February 1807 - 31 December 1809) of acceptance of his proposal; a request for information about necessary instruments; and that the project was postponed due to the "situation of external relations". On 10 August, 2 September, and 12 September, Hassler and Patterson exchanged letters concerning procuring the instruments, overseeing their construction, anticipated costs estimates, and agreeing to undertake the mission.

Hassler's tenure at West Point as Acting Professor of Mathematics (appointed by Jefferson) was an interesting phase of his career. Shortly after arrival, Hassler began writing Elements of Analytic Trigonometry, Plane and Spherical. Two of his students were John J. Abert (commander of the U.S. Topographical Engineers; 1833 - 1861), and General Joseph G. Swift (first graduate of West Point; Chief of Corps of Engineers; and Superintendent of West Point). In early 1810, recently appointed Secretary of War William Eustis announced a policy that civilians could not be employed at West Point. Colonel Jonathan Williams (a nephew of Benjamin Franklin), Superintendent of West Point, wrote to Hassler a most complimentary letter concerning Hassler's deportment and character (1 January 1810). Hassler was not unemployed long, as he joined the faculty of Union College (Schenectady, New York) on 20 March 1810. Union College president Eliphant Nott wrote about Hassler (10 April 1810) ". . . The mathematical professorship is filled by a learned Swiss - - - F.R. Hassler - - - confessedly the ablest mathematician and astronomer that was ever in America - - - and who goes through the lectures and experiments in the manner of the most approved European professors." The strict discipline of the academic environment at West Point appeared to suit Hassler's teaching methods. However, at Union College the youths of middle- and upper-class families did not appreciate his efforts. Many of the recorded statements of former students engender the image of an "absent minded professor".

On 16 April 1811, after a communication from Secretary Gallatin (in March 1811), Hassler agreed upon the proposed mission to procure the instruments. He resigned his Union College

academic appointment on 23 July 1811. His formal U.S. government appointment is dated 27 July 1811. On 29 August he embarked on the Armata for Liverpool, England. Between 11 October through 14 November, Hassler entered into negotiations with Troughton (later known as Troughton and Simms) to construct the major instruments. He noted that the assignment would be delayed in order to complete construction of the Great Mural Circle of the Greenwich Observatory. During the first six months of 1812, Hassler addressed the technical and administrative aspects of his mission. On 27 June, a letter from the Treasury Department instructed Hassler to remain in London until completion of his mission even though the signs of political circumstances were unknown. On 9 February 1813, Hassler traveled to the Continent to purchase the books and standards in France, and continued to Switzerland to address private matters resulting from his father's death. He returned to England in late May or early June with the French Standards. On 25 November 1813, Hassler was again instructed by the Treasury Department to remain in England until his mission was completed.

The remainder of 1814 witnessed delays by Troughton to finish the assignments. On 10 March 1815, Hassler compared the French standards (meter standards) to the Standard Scale constructed by Troughton. In mid 1815, the instruments were delivered to Hassler, and packed to accompany him to America aboard the ship Susan. On 16 October 1815, Hassler, his books and instruments arrived in Delaware Bay, and landed in Philadelphia on 22 October. The cargo was deposited with Dr. Patterson at the University of Pennsylvania. Hassler arrived in Washington on the last day of 1815.

In January 1816, Hassler exchanged several communications with Mr. Dallas, Secretary of the Treasury, to be forwarded to the President, including the plan to survey the coast. On 27 July 1816, Hassler arrived at Burlington, New Jersey, to commence reconnoitering the area. Work continued through the fall. On 4 November, Hassler's work was interrupted by a law suit "about some branches of a cedar bush (apparently being removed) . . . to make the rest (of the bush) serve as a signal." Shortly after the incident (23 November) Hassler wrote "requesting an ostensible paper to be given to me, to legitimate myself as acting under public authority . . .".

Over two months were required to make the necessary comparisons between the base apparatus and the line standards. The first base line was located in the Valley of English Creek, a tributary of the Hackensack River. The base line measurements began on 7 May 1817 between stations Cherry Hill and Vreeland (9,446.15 meters, or 30,991.24 feet, or 5.8696 miles). The base line was not incorporated into the Easter Oblique Arc. In 1817, Hassler and Major J.J. (John James) Abert placed signals on Staten Island, Wesel Mtn (Weasel), Cranetown Mtn., Springfield Mtn. Bergen Neck, and several other sites near Gravesend and Fort Lewis. In his report dated 9 April 1818, Hassler stated he had "formed" about 80 triangles in four months. On 9 March 1818, Hassler had completed the reduction of the geodetic operations, and that the triangle computations had begun. On 6 April 1818, the Secretary of the Treasury, W.H. Crawford, instructed Hassler to send the results of his work without delay. The Secretary further stated: ". . . that the little progress hither to made in the work had caused general dissatisfaction in Congress." Part of the delay was due to only occasional support by Army personnel who were frequently pursuing other duties or assignments. A significant portion of the time Hassler had only his eighteen-year old son, Scipio, to assist him. Hassler immediately wrote a five-page letter explaining the work and what had been accomplished. He arrived in Washington on the evening of 14 April. However, his efforts were too late. Earlier on that day, Congress repealed the law authorizing the survey of the coast and directing that all future work would be executed by naval and military officers. On 21 April, Hassler met with the President and submitted his letter (of explanation). The President offered Hassler an opportunity to work on the US - Canada boundary survey, resulting from negotiations ending the War of 1812. On 29 April 1818, Hassler and Brig. General Joseph G. Swift, Chief of Engineers, met, and Hassler delivered his journals, results, etc. On 9 May, the instruments not required on the US - Canada boundary survey were delivered to the Quarter-Master General. In December 1818 and February 1819, Hassler submitted the remainder of the equipment (horses, carriages, etc.), the remaining instruments, books, and other items acquired for the survey of the coast.

Thus terminated Professor Hassler's first affiliation with the U.S. Coast Survey.

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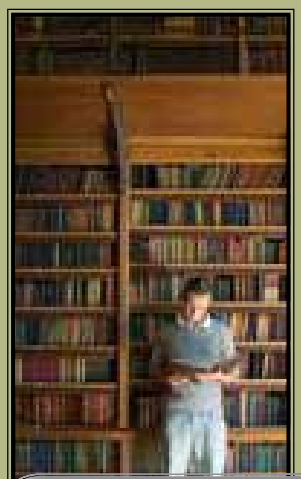

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