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VOLUME LVIII

Winter 2023

ISSUE I

MONTANA MAP OF MARSH CHAPTERS



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Editor: Kay McDonald

The Montana Association of Registered Land Surveyors is a statewide organization of professional land surveyors licensed to execute land surveys in the state of Montana and dedicated to improving the quality of professional land surveying and land records in the state of Montana. MARLS motto is:

"WE MEASURE UP"

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TREASURE STATE SURVEYOR

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WINTER 2023

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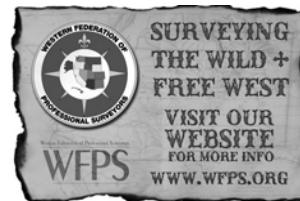
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President's Message

Christopher W. Kosine, PLS

Fellow Members,

The 2023 conference in Great Falls was a success by all accounts. I believe we had close to 275 members and spouses attend this year. Thank you to everyone that attended or volunteered. There are many reasons to attend. Some come to get out of work, some to get their Continuing Education Credits and others might come to meet up with friends from the other side of the state. No matter what your reason was, thank you again for helping to make it a success.

I don't know about you, but I love this time of year. While winter is going to make its presence known for another month or two we are starting to see longer and warmer days. It's a reminder that the frost is going to start coming out of the ground and the phones are going to start ringing, both are welcome after a long cold winter. I wish each and everyone a profitable and safe upcoming survey season. We may work at competing companies, but we are all part of the same amazing profession.

If you haven't read the MARLS mission statement, please take a few minutes to do so. I've glanced over it in the past while reading the Treasure State Surveyor, but recently read each bullet point. It helps remind us WHY we do what we do.

Sincerely,

Christopher W. Kosine, PLS

MARLS President



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MARLS members ~ We encourage you to sign into the MARLS members only site to keep you up to date with MARLS information, participation of our MARLS members' discussion board, legislation, meetings, reports and many more currents news and announcements.

We also encourage you to use the MARLS discussion forum to let us know if you have ideas, comments or just want to chat.

Contact Kay at kay@marls.com if you need help signing into the members side of the MARLS website.

About the cover...

Artwork by James A. Flansburg, PLS

Contact Mrs. James Flansburg if you are interested in Jim's artwork. His artwork has been the cover of the Treasure State Surveyor for over 33 years.

He specialized in bronzes, ink sketches and watercolors. He inserted in all his pictures a surveyors marker which are fun to find.

*Mrs. James A. Flansburg
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Phone: 406-543-6835*

The artist reserves all rights on the cover.

MONTANA ASSOCIATION OF REGISTERED LAND SURVEYORS MISSION STATEMENT

PREAMBLE:

The true merit of a profession is determined by the value of its services to society. Therefore, the Montana Association of Registered Land Surveyors does dedicate itself to the promotion and the betterment of the profession of land surveying as a social and economic element vital to the welfare of society.

The objectives of the association are:

- ◆ To promote the common good and welfare of its members and the public in the profession of land surveying.
- ◆ To advance the study of land surveying and the education of land surveyors.
- ◆ To promote public knowledge, faith, and reliance in licensed professional land surveyors and their work.
- ◆ To foster and maintain high standards of professional ethics in the practice of land surveying.
- ◆ To foster and support legislation generally beneficial to the profession and to the citizens of the state of Montana.
- ◆ To promote closer relations, understanding, and cooperation within the profession.
- ◆ To establish better relations between the land surveyor and other professions interested in land surveying.
- ◆ To aid and encourage the interest of associate and student members of the association.

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MARLS Scholarship Foundation, Inc. Surveying Scholarships and Surveyors Assistance Fund Information

The MARLS Scholarship Foundation, Inc. (MSF) consists of two funds being the MSF Scholarship Fund and the MSF Surveyor's Assistance Fund. MSF Scholarship applications available at www.marls.com.

The MSF Scholarship Fund awards scholarships to first and second year land surveying students and also the National Trig-Star Program for high school students. The MSF Surveyor's Assistance Fund is intended to help surveyors with financial assistance. Should you know of a MARLS member with a financial need or crisis, please discuss at the chapter level and forward your recommendation to MSF President Bill Weikel or Kay. The MSF Board of Directors will take the recommendation into consideration.

THE FASTEST PORCUPINE IN THE WEST

By: Donald Biehl, PLS

This story occurred in the summer of 2004. I was working with the BLM at the time and the crew consisted of Big "T", a 6'3" marine sniper who was a veteran of the Vietnam War and Montana Licensed Surveyor, and at the time of this event a GS-11 Survey Crew Chief for the BLM Cadastral Survey Section headquartered in Billings, Montana and myself, a 23.5-year Air Force Veteran (E-8) retired 1 Aug 1991. I had my LSIT and was working on my Montana LS at the time of the event. Rounding out the crew were Cody and Miss "S" who were young college students. We were all assigned to a project to survey and monument three sections of the Crow Reservation along Thompson Creek that also intermingled with some privately owned property.

The crew worked eight days on and six days off meeting in Billings early in the morning on Tuesday, loading up the six-passenger pickup with equipment and personal bags, and heading off to Sheridan, Wyoming where our base camp would be. We arrived and unloaded our personal items and checked in at the motel. We would spend the first day checking out the job site, which was 30 miles to the north, for road conditions and access. We hit it hard the next seven days, settling into a routine and accomplishing our tasks. On Saturday night we

would have supper and go to the local watering hole and have a beer or two. I was the driver and would hit the rack early so I could navigate the 30-mile drive to the job site in the morning on Sunday while the other three napped. On this warm, dry September morning, the others were dragging, but we loaded up and headed off to work. Big "T" asked me to wake him if I saw a porcupine on the way to the job site. He needed some quills for an authentic Native American beaded belt. After we turned onto the dirt road leading to the job site, we drove three miles or so when Big "T" woke and told me to stop the truck. He shouted, "There is a porcupine in the barrow pit!" He jumped out of the truck in a hurry and ran down into the barrow pit in hot pursuit of a large, sparsely quilled porcupine. We watched as the porcupine saw Big "T" coming and took off at super speed raising a cloud of dust and moving like a jackrabbit in and out of the barrow pit and into the surrounding woods leaving Big "T" behind in his dust cloud. Big "T" returned to the truck amid much laughter from the rest of us. Big "T" said, "Did any of you know a porcupine could run that fast?" We told him we could hardly see him for all the dust that porcupine was kicking up. Big "T" did eventually find a slow porcupine but not in Thompson Creek. We all had a theory for this highly unusual event: this fastest porcupine in the west, having sparse quills, must have had several prior encounters with two-legged quill hunters who were slightly more adept at quill nabbing because the one Big "T" was said to have obtained his quills from was much slower and more quill full.

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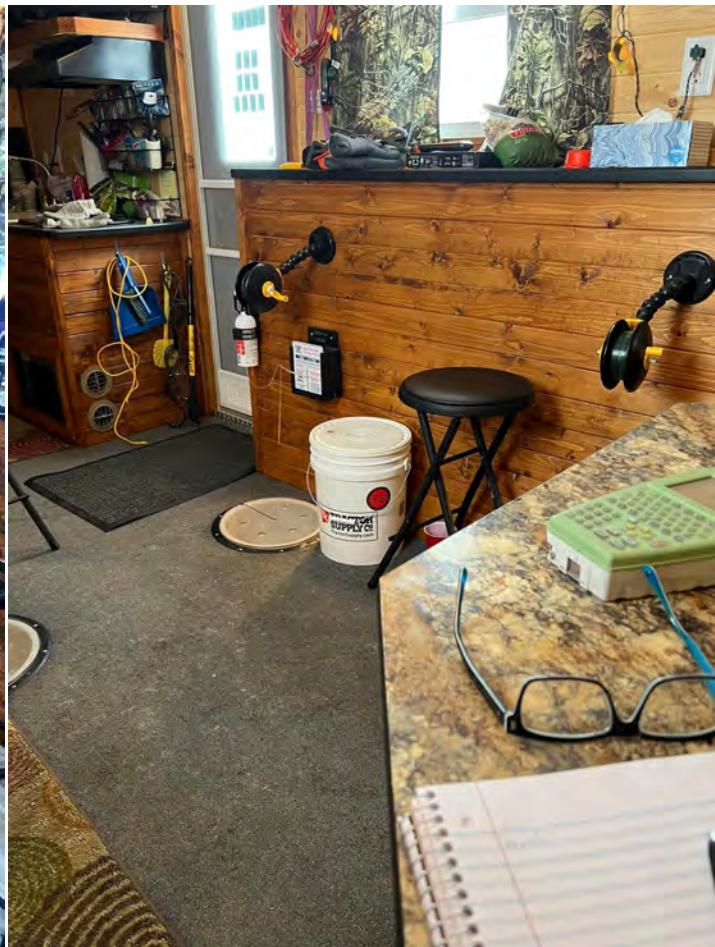
Surveying In Montana Working and Ice Fishing

Submitted by:
Joe Kauffman, PLS



*Always
fun to catch
a few fish
too!*





Breakfast on the Bighorn numbered prints

The MSF of the "Breakfast on the Bighorn" limited edition number color prints are available for purchase from MARLS Scholarship Foundation. This 250 copy limited edition print has been created from the original painting by Montana artist "Shorty" Shope depicting a Roy Bandy 1912 GLO survey camp. This colorful reflection of surveying in the early 1900's has previously been seen in the "Tiny" Tillotson survey book.

Copies of the print will be available from MARLS Scholarship Foundation in the following form:

15" X 20 1/2 " print paper for \$95.00 plus S&H.
Prints 1 through 15 are reserved for MSF Scholarship auction and special presentations.

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We also encourage you to use the MARLS discussion forum to let us know if you have ideas, comments or just want to chat.

Contact Kay at kay@marls.com if you need help signing into the members side of the MARLS website.

Searching for Roy Bandy's 1912 Campsite

By: Glenn Borkenhagen



Figure 1 - *Breakfast on the Big Horns*, oil painting by Irvin "Shorty" Shope, 1970

During August 1912 a General Land Office (GLO) survey party headed by Roy Bandy was traveling across northern Wyoming with two horse-drawn wagons and one saddle horse. The GLO, part of the U.S. Department of the Interior, was the government agency designated by law to survey the public lands and make them available for homesteading, sale, or transfer by other means from federal to private ownership. This crew had just finished work associated with some homestead entry surveys in Wyoming's Sunlight Basin about 19 miles southeast of Cooke City, Montana and was headed for the area of the Little Bighorn River about 14 miles west of Parkman, Wyoming to complete a township survey begun in 1902 to enable finalization of some homestead claims.

Their route took them along the summit of the Bighorn Mountains within the Bighorn National Forest, and the evening of 12

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August the party traveled until dusk before finding and camping beside a snowbank left from the previous winter. As they were traveling high above any flowing streams, the snowbank was a welcome sight that would provide water for the crew and their horses.

The next morning, Roy Bandy captured a Kodak photo of their campsite with the snowbank in the background as his wife Inez, the cook for the party, was preparing breakfast. Almost 60 years later, in 1970, Roy and his daughter Zoe Reith commissioned Irvin "Shorty" Shope, a popular Montana artist, to create an oil painting titled *Breakfast on the Big Horns* (Figure 1) based on that photo in memory of Inez. Prints of that painting are regularly offered on scholarship auctions sponsored by the Montana Association of Registered Land Surveyors (MARLS) at their annual conferences, as well as being sold outright by MARLS, and now grace the walls of many offices and homes in the region.

William Roy Bandy (1885-1972) began his land-surveying career in 1905 near Garland, Wyoming while employed by a surveyor performing work for the GLO on a contract basis. In 1906 Bandy was appointed a U.S. Deputy Surveyor, reportedly the youngest person to receive such an appointment. During 1907 through 1910 he worked as a surveyor and engineer on canal and tunnel construction for irrigation projects, both federal and private, in Wyoming and Idaho.

In 1910 the GLO, in accordance with a new law, ended their previous practice of awarding contracts for surveys of public land. Such surveys were thereafter to be done by surveyors directly employed by the GLO. In 1911, newly married and looking for stable employment, Mr. Bandy accepted employment as a U.S. Transitman with the Wyoming office of the GLO with headquarters in Cheyenne. His first assignment included the resurvey of six townships around and to the north of Cody. His wife Inez joined the party as cook. In 1914 he was transferred to the Montana GLO headquartered at Helena where he remained through 1945 except for a few special details.

In 1930 Bandy earned a Bachelor of Law degree from the Blackstone Institute of Law of Chicago, Illinois.

In 1929 and 1930 Congress enacted legislation changing large parts of the north and east boundaries of Yellowstone National Park from the original rectangle defined at the park's establishment in 1872 by parallels of latitude and meridians of longitude to a shape in part defined by the crests of mountain ranges that divided watersheds. During 1931 through 1933 Bandy and his crews surveyed the rough and remote eastern boundary of the park as well as the revised portions of the park's northern boundary.

The summer of 1936 found Bandy (then 51 years old) leading survey parties doing township completion surveys in the rugged mountains around Cooke City, Montana and along the eastern side of the Pryor Mountains, an area previously considered to be impossible to survey.

During the mid-1940s the Pick-Sloan Missouri Basin Program, which provided a comprehensive plan for the conservation, control, and use of water resources in the entire Missouri River Basin, began to take shape under direction of the U.S. Bureau of Reclamation, part of the U.S. Department of the Interior. In 1946 the GLO Director placed Bandy in charge of all public land surveys in the ten Missouri River Basin states with the title Cadastral Engineer, a position he held until he retired at the end of 1954. Upon completion of his long career of government service, the Secretary of the Interior granted Mr. Bandy the Department's highest honor, the Distinguished Service Award.

In his retirement, Bandy wrote several articles that appeared in local newspapers as well as in regional and national magazines. He also served as a consultant on property and boundary issues.

This writer, the successful bidder on a framed print of *Breakfast on the Big Horns* at a MARLS scholarship auction held sometime in the late 1990s or early 2000s, had for several years considered an attempt to locate Bandy's 1912 campsite. The writer's home in Cody, Wyoming is about 65 air miles from the search area.

At a Wyoming Engineering Society convention I mentioned this possible quest to Joel Ebner, who was at the time a cadastral surveyor assigned to the Gillette, Wyoming office of the Bureau of Land Management (BLM – established in 1946 when the GLO was merged with the U.S. Grazing Service). A few weeks later, Mr. Ebner sent an envelope (postmark reads 03 April 2003) containing several items including photocopies of pages from a 1991 BLM publication titled *Running Line – Recollections of Surveyors* that contain a Bandy account of the party's journey across the Bighorn Mountains. Also included were documents related to the work they were traveling to as well as a photocopy of the title page of *Legal Principles of Property Boundary Location on the Ground in the Public Land Survey States* (by Ira M. Tillotson, 1973) that features *Breakfast on the Big Horns*. The page immediately opposite the title page of the Tillotson book includes an explanation of the painting written by Roy Bandy that states the elevation of the campsite as 9,560 feet. The same Bandy writing also appears on the back of my framed print of *Breakfast on the Big Horns*.

My campaign to locate the campsite remained stuck in "Park" until the summer of 2018. My initial activities included downloading and acquiring from others historic maps of the area, investigating historic travel routes in the area, and trying to locate a print of the photo on which the painting is based.

(Continued on page 12)

Bandy's account in *Running Line* . . . states they crossed the Bighorn River at Kane, Wyoming where a ferry was in operation. From Kane, evidence suggests the historic route for teams and wagons heading eastward to the top of the Bighorns ascended via the Five Springs Creek drainage to around 8,000 feet elevation before turning south into the Crystal Creek drainage and passing south of Medicine Mountain. A 1914 Bighorn National Forest map shows this route being used to reach the Porcupine Creek Ranger Station (now known as the Porcupine Ranger Station; that name appears on a 1927 Bighorn National Forest map) from the west. That 1914 map also shows two sawmills along that route close to the western Forest boundary. That is the route developed during the 1930s into part of the Dayton-Kane Road, the western portion of which later became officially known as U.S. Highway 14A. U.S. Highway 14A on the west side of the Bighorns was relocated to its current farther-south alignment in 1983.

Information provided in 2003 by Joel Ebner showed the location of the surveys the Bandy party performed after reaching their destination. Bandy's account includes the name of the homestead entryman, W.T. Broderick, waiting for their arrival. Searching the online GLO records defined the lands patented to Mr. Broderick.

In 1901 the U.S. Geological Survey (USGS) issued the Bald Mountain 30-minute (1:125,000 scale) quadrangle map (hereinafter referred to as a "quad"). That map was part of a massive campaign to map the newly established Forest Reserves, which became today's National Forests. The 1901 Bald Mountain quad shows a group of unimproved roads running from the area of the Porcupine Creek / Porcupine Ranger Station up over Duncom Mountain, then north and east until entering Montana a few miles west of the Little Bighorn River and the party's destination. Those roads still exist today; the ones of primary interest are known by the names Sheep Mountain Road (Forest Service Road 11) and Marble Quarry Road (Forest Service Road 111).

Due to terrain and available roads the Bandy party would have traveled through southern Montana for about seven miles before re-entering Wyoming on the way to their destination. The Wyoming road now designated by Sheridan County as Pass Creek Road also appears on the 1901 Bald Mountain quad.

It remains a mystery how Roy Bandy determined the elevation of the campsite. Did he simply interpolate the elevation from the 100-foot-interval contour lines on the USGS quad? Field notes of the work done at their destination state they did have a clinometer which they used while chaining to determine true horizontal distances. Did they use their transit or clinometer to derive elevation by employing trigonometric leveling to a local bench mark? Or did they just read the elevation on a bench mark they passed (a bench mark very close to Sheep Mountain Road was marked "9566 SHER" and the group would have passed it - the capless pipe was still protruding from the ground on 17 September 2018 but was found broken off flush with ground on 13 August 2020) and call that good?

Drawing from the rather precise elevation mentioned above, I decided to concentrate on sites with elevations between 9,500 and 9,600 feet with a history of persistent snow. I created a KMZ file consisting of contour lines at those elevations and opened it in Google Earth.

The latest Google Earth satellite imagery for the general area was (and still is) dated 25 June 2017. Several areas along the route of interest (generally described as between roughly three to eight miles north of U.S. Highway 14A along the Big Horn-Sheridan County line, which in that area follows the hydrologic divide between the Bighorn River to the west and the Little Bighorn River to the east) showed snow remaining on that date at between 9,500 and 9,600 feet elevation.

I reached Roy's grandson Dirk Reith who is my age, we both graduated high school in 1968. He lives in Hawaii and has a business called Maui Movers. He said that in addition to the original painting that hangs in his living room, he had a box of papers and photos that Roy left behind to his late mother Zoe Reith (Roy and Inez's only child who lived to maturity), who in turn left it to him. Dirk said he would go through it and let me know if he found anything that may be of use in my efforts.

During July 2018 I hired an independent researcher based in Helena, Montana to visit the Montana Historical Society (MHS) to see what she could find that could aid my search. The Bandy file at MHS did not have any photos or negatives, but it did include a Bandy manuscript that provided another *Breakfast on the Big Horns* account, as well as newspaper clippings that included an article Bandy wrote that appeared in the Great Falls Tribune on Sunday 03 September 1961 that recounted the party's adventure while crossing the Bighorn River on their return trip to Wyoming's Bighorn Basin later in 1912. That piece included a cropped photo of the campsite depicted in *Breakfast on the Big Horns* but was too grainy to be of any use in the immediate project.

My first trip to the area on 03 July 2018 was mainly for orientation and casually looking around on Sheep Mountain Road for someplace obvious.

My second visit on 20 July explored the areas generally southwest of Medicine Mountain with elevations between 9500 and 9600 feet and late-season snowbanks. It quickly became obvious that it would have been impossible to traverse those areas with teams and wagons. That outing did provide plenty of exercise nonetheless.

Before my third outing on 01 August 2018 I used QGIS (an open-source geographic information system [GIS] program) to georeference a road shown on a 1917 Forest Service map onto the 1901 Bald Mountain 15-minute quad, found that they agreed well as to the road location. Loaded that map into my Garmin Montana GPS receiver and headed for the Bighorns. While driving to the search area that morning on Sheep Mountain Road it was noticed that as I got close to Duncom Mountain (which for the purposes of this article I consider to be the summit where U.S. Coast & Geodetic Survey [C&GS] triangulation station DUNCOM

[PID PW0564] is located, not the location shown by Google Earth as Duncum Mountain) I was a few hundred feet west of the 1917 road. The current road is on a significant side hill and crosses several gullies, which would have been an unlikely (more like impossible) road alignment before the advent of motorized earthmoving equipment. The 1901/1917 road went across the top of the mountain crossing contour lines at right angles. To the best of this writer's knowledge, all renditions of the 1901 Bald Mountain USGS quad show this alignment. The C&GS recovery notes for point DUNCOM indicate Sheep Mountain Road was in its current alignment in 1957. The 1960 Bald Mountain 7.5-minute (1:24,000 scale) USGS quad shows the road at its current farther west alignment.

During the morning I walked over the summit of Duncom Mountain looking for possible campsites to the south and east and did not see anything. After lunch I investigated an area spotted earlier from the summit, generally north-northwest of said summit. I believed that to be the most likely campsite. It had a significant amount of snow remaining on 01 August, it being the only wagon-accessible snow I found that day, there was a small stream in a defined channel flowing from the snowbank from which it would have been easy to fill buckets (as mentioned by Bandy in his accounts), the elevation matched the reports, and it would have been fairly accessible with teams and wagons with minimal side hill. (This site also had snow remaining on 14 August 2019 and 13 August 2020.)

Around the same time I was discussing this little mission with some Wyoming and Montana surveyors, including Stanton "Stan" Abell (Wyoming and Montana professional engineer and land surveyor) of Worland, Wyoming and Kurt Luebke (professional land surveyor in Wyoming, Montana, and eleven additional states) of Missoula, Montana.

During August 2018 Linda Abell (wife of Stan Abell) came across the Bandy *Breakfast on the Big Horns* account that appeared in the March 2018 issue of *The Florida Surveyor*. That retelling mentions Sheep Mountain to the north (which is not exactly "towering" as Bandy described it), states the snowbank was 50 feet deep, and indicates the "altitude" as 9546 feet. Here Bandy also describes how they went northeasterly into Montana a few miles to intersect a road that led southeasterly back into Wyoming and the lands to be surveyed, which confirmed the route assumed earlier.

Stan and Linda Abell visited the area during Labor Day weekend of 2018 and Stan offered his own thesis as to the campsite location. Kurt Luebke submitted his idea as well, based only on his examination of the maps and other materials available at the time.

As the anniversary date of the event neared in 2019, I planned a trip to the Bighorns for 14 August. On 13 August I went to the post office and found waiting two boxes from Roy's grandson Dirk. He had sent me everything from some of Roy's grammar-school report cards and letters of reference he brought with him to Wyoming in 1905 to his late-in-life writings. Included were three more accounts of the *Breakfast on the Big Horns* campsite. I soon found a print of the photo that was the basis for the painting (Figure 7), obviously Roy was not in the photo because he was behind the camera - teamster Karl Suhr is where Roy appears in the painting. There were also two other prints (on postcards) of the group standing on the snowbank, one taken from the north and one from the east. I was off to the races, or so I thought.



Figure 2 – 1912 photo of group on snowbank, taken from the north, with prominent rocks marked

It was believed that Rock 1 and Rock 2 would be the key to identifying the actual campsite. As of that time, the rocks shown on Figure 3 (at the site of my 2018 thesis) appeared to be the closest match to those in the historic image, at least among those seen by this writer. Things can and do change over 110 years, with frost heave, soil accumulation, erosion, etc.

I scanned the photo prints and printed my working copies, then headed up the mountain the next morning. The photo of the group taken from the north showed two good-sized rocks in the background. Those rocks are denoted as Rock 1 and Rock 2 on Figure 2. That photo was taken by Roy's younger brother Willis Bandy (who appears at the far left in the painting and in Figure 7) and includes Roy at the lower left. Rock 1 and Rock 2 sort-of matched what is now at the site I found the previous summer and that are shown in Figure 3. I walked the areas chosen by Stan and Kurt, and honestly did not see anything matching the background of the from-the-north image.

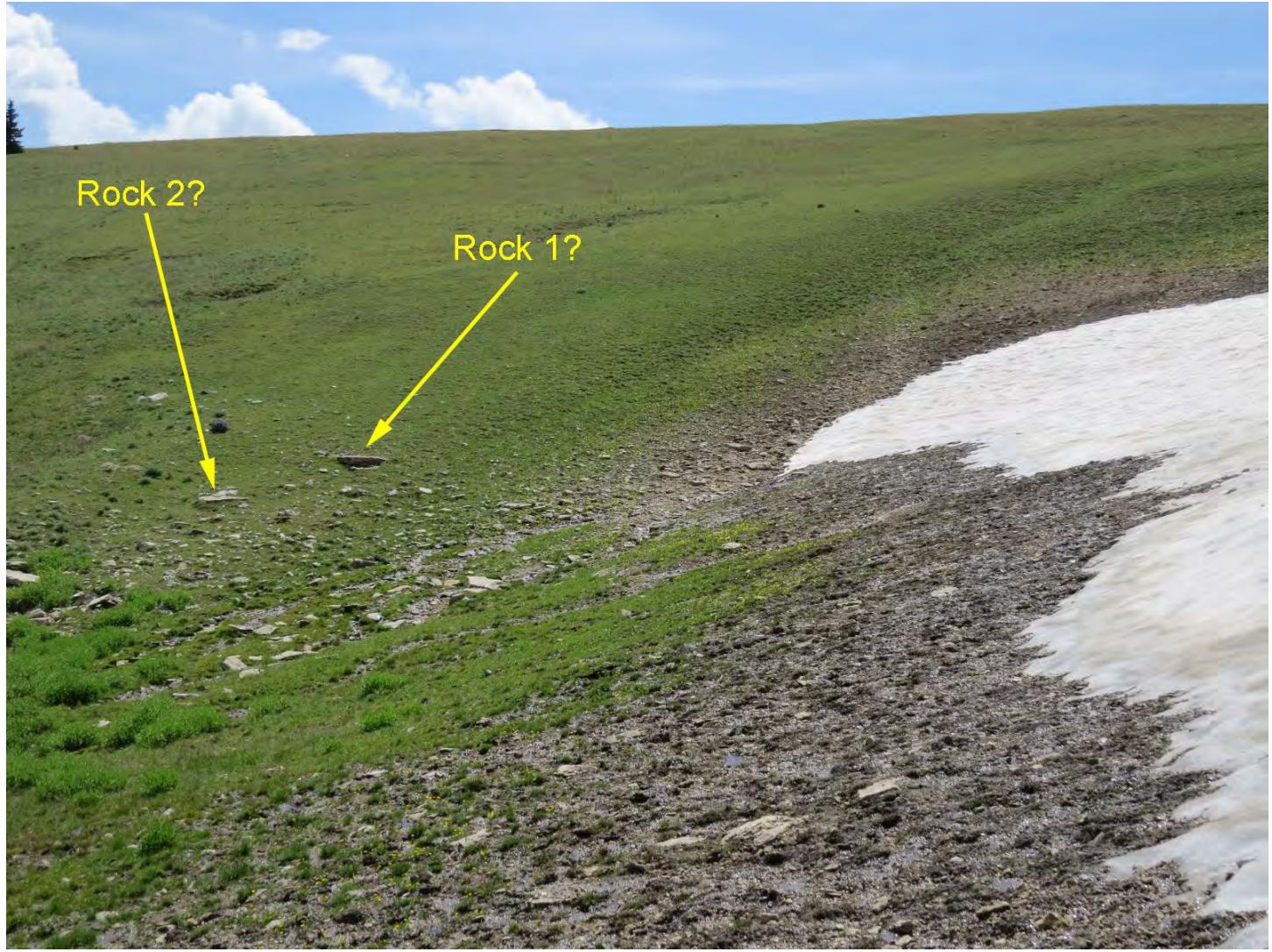


Figure 3 – Prominent rocks seen at site of author's location thesis of 2018-08-01, as seen on 14 August 2019

Bandy's account in *The Florida Surveyor* described the campsite as being "nestled in the shelter of a natural cove." My bowl-shaped site seemed to match that characteristic well.

During the 14 August 2019 visit I also located USGS BM 9810 SHER, which supported my original thesis because in *USGS Bulletin 558 Results of Spirit Leveling in Wyoming 1896 to 1912 Inclusive* (published in 1914) bench mark 9810 SHER is described as being "150 feet east of road". That information confirms the original location of the road and the path taken by the Bandy party near the Duncom Mountain summit. If one zooms in on the Google Earth imagery dated 25 June 2017 the tracks of this original route are visible 160 feet west of USGS BM 9810 SHER. It is believed they could have seen a snowbank at the site of my 2018 thesis from a wagon seat.

Then on 16 August 2019 I dug further into the materials received from Dirk earlier that week and found a folded copy of the 1960 Boyd Ridge 7.5-minute (1:24,000 scale) USGS quad, which was apparently marked up by Roy himself! In addition to indicating the location of the campsite and the route traveled, Roy also marked the map with the land's section, township, and range in the

Public Land Survey System (PLSS).

Figure 4 is a satellite image showing where Roy marked the USGS quad of the previous paragraph. It also shows the three location theses presented during 2018, the C&GS triangulation station DUNCOM, and the USGS bench marks 9566 SHER and 9810 SHER. The 9500-foot contour line appears in red and the 9600-foot contour line appears in blue. The white line running south to north is Sheep Mountain Road. Finally, to avoid including another image in this writeup, the actual campsite location is also shown there.

To provide a sense of scale for Figure 4, the distance between USGS BM 9810 SHER on the south end and the Stan Abell thesis 2018-09-04 on the north end is 2.45 miles.

Based on Roy's mark, Kurt Luebke's thesis is the winner!

Roy's PLSS statement of Section 5 in Township 55 North Range 91 West Sixth Principal Meridian (S5 T55N R91W) is quite a ways off - that land remains unsurveyed but by protraction shown on the 1993 Boyd Ridge USGS quad it would be Section 28 of Township 57 North Range 91 West. That is roughly 8 miles farther north than Roy's section.

Nothing found to date indicates Roy ever revisited the site but he and Inez lived in Billings, Montana (about 70 air miles to the north-northwest) for several years in the late-1940s-to-mid 1950s era and he wrote about visiting the Cody-Powell area at least once.

During 2020 I found another version of the *Breakfast on the Big Horns* story, this one appeared in the Congressional Record – Senate dated 08 September 1972. Roy Bandy passed away on 23 July 1972.

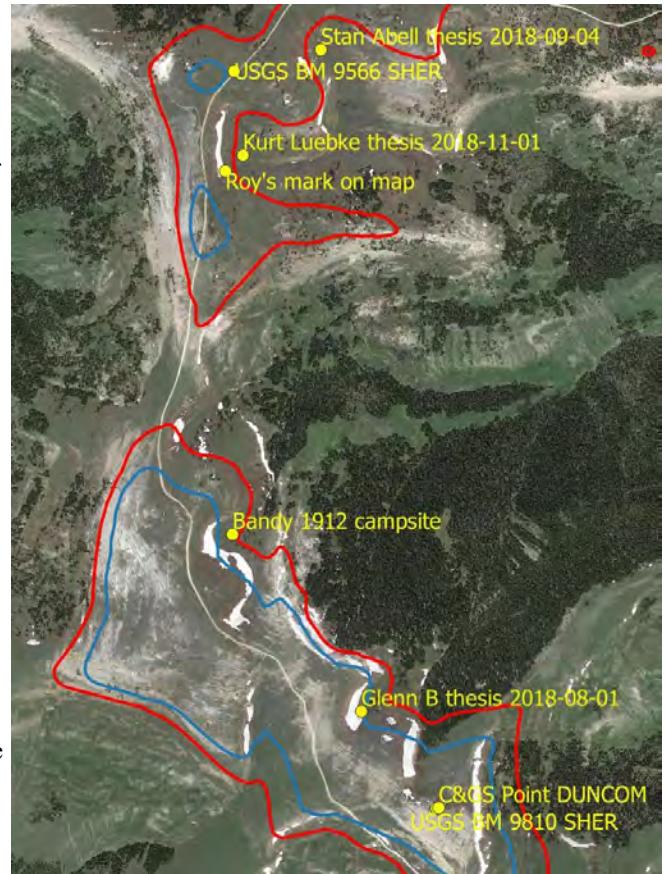


Figure 4 – Annotated satellite image

So things were uncertain for a few years. My site from 2018 matched Bandy's description in several ways, but it was a stretch to believe the rocks in Figure 3 were actually the ones shown in Figure 2. There is nothing in the area selected by Stan and Kurt (as well as where Roy marked the USGS quad) that looks like the background in Figure 2 and that area does not have much of anything for late-season snow (climate change??). Also, there are no visible channels of runoff water in that area.

Cody Schatz (Wyoming professional engineer and land surveyor) of Cody, Wyoming and I went to the area on Sunday 28 June 2020. We walked about two miles that morning, but unfortunately the rain forecast for mid-day arrived right on schedule. A section of the south end of Sheep Mountain Road is steep with some deep ruts so we quickly left the area to avoid getting stuck or worse. We did not have time to check out the site of my 2018 thesis.

On Saturday 20 August 2022, 110 years and one week after the photo was taken, three of us (hiking buddies Kathy Morgan and Doneen Fitzsimmons, both of Cody, Wyoming, and myself) ventured back to the area.

Our first stop was my favored site from 2018, where I failed to convince my fellow searchers that that was the site pictured in the 1912 photos. They noted that the small drainage features descending right-to-left in the 1912 photo of the group on snowbank viewed from north (Figure 2) were missing (as Kurt Luebke pointed out in an email message in August 2019) and the terrain generally did not match that shown in the photo.

Then we went to the next wagon-accessible site to the north with a historic late-season snowbank, an area I had walked three times previously, including with Cody Schatz on our rain-shortened 2020 search. Cody mentioned that based on his decades-long experience in the area this site is where he had observed the most persistent snowbank. This site does have runoff channels that would have made filling buckets easy. Again nothing matching Rock 1 and Rock 2 was immediately seen, but that did not stop my sharp-eyed teammates from looking for and finding similarities.

No snow was present this day but Kathy and Doneen soon noted that the terrain features matched those shown in the from-the-north photo of the group on the snowbank. They also observed five or more smaller nearby rocks that matched up nearly perfectly with those appearing in the image of the group on snowbank viewed from north, as well as some farther-away rocks, as shown in Figures 5 and 6. Finally, we noted that the rocks near the horizon in the background of the photo featuring Inez Bandy cooking breakfast agreed with those seen presently. Those are shown in Figures 7 and 8. This site also agreed with Bandy's account in *The Florida Surveyor* describing the campsite as being "nestled in the shelter of a natural cove." On our walk back up to Sheep Mountain Road we noted a long-abandoned two-track path about 140 feet east of the current road that is presumably the route used

in 1912, which means the snowbank would have been obvious from a wagon. We suspect that they spotted the snowbank as they passed by, then circled around to their right and down to the campsite.



Figure 5 – 1912 from-the-north image with comparison rocks circled

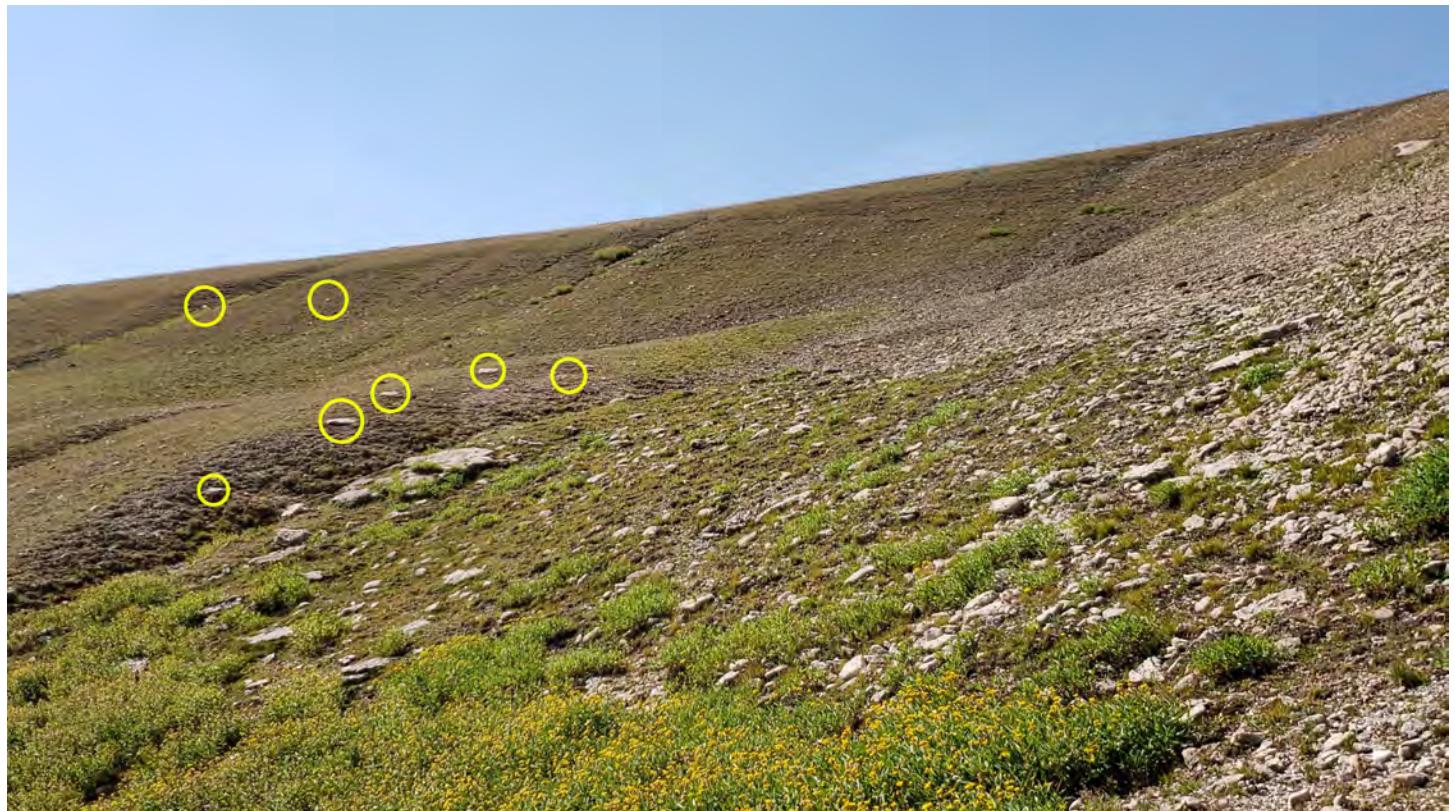


Figure 6 – 2022 from-the-north image with comparison rocks circled



Figure 7 – 1912 from-the-east image of campsite with comparison rocks circled



Figure 8 – 2022 from-the-east image with comparison rocks circled

So we determined that the Bandy party's August 1912 campsite "on the Big Horns" was very close to the site from which the image in Figure 8 was taken, which is 44.87355 degrees north latitude and 107.85802 degrees west longitude. That position is near the northwest corner of the Bald Mountain 7.5-minute (1:24,000 scale) USGS quad.

The astute reader will now be asking "*What about Rock 1 and Rock 2? They do not appear in Figure 6 (the 2022 comparison image). Where are they?*" Well, both of those rocks fell victim to erosion over the past 110 years and are now on the side and bottom of a gully respectively, as shown in Figures 9 through 11. Those rocks also appear from a distance in Figure 8. That is why they went unobserved in my three previous visits to the site.

I learned a valuable lesson that day and gladly give Kathy and Doneen full credit for finding the site. Without them I would still be wandering around looking for Rock 1 and Rock 2, expecting to find them as they appeared in 1912!



Figure 9 – Rock 1 viewed from the north



Figure 10 – Rock 2 viewed from the northeast

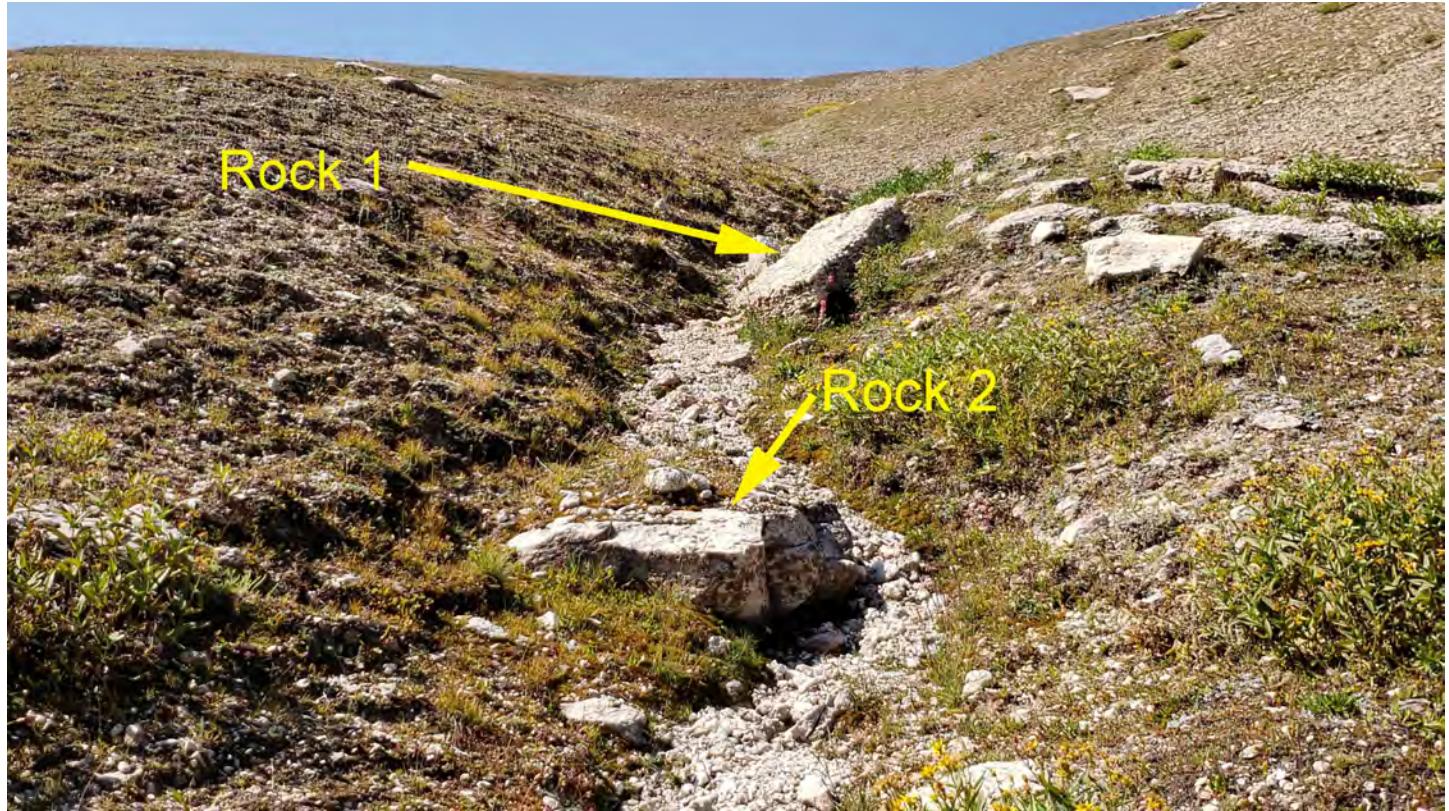


Figure 11 – Rock 1 and Rock 2 viewed from the east

Comments

The day after we located Bandy's 1912 campsite the temperature was forecast to reach over 90 degrees in Cody. Early on 21 August a group of us headed for Yellowstone National Park (YNP). There we hiked up Avalanche Peak, which is on the eastern border of YNP. My companions humored me on the way down and we took a 0.31-mile side trip to YNP Mile Corner 32½ which was set by Roy Bandy in 1932, 20 years after he took the snapshot memorialized in *Breakfast on the Big Horns*.

Now my next task is to get all the materials entrusted to me by Roy's grandson Dirk to someplace where they will be preserved and accessible to future users. Since Roy spent the majority of his life and career in Montana, the Montana Historical Society (MHS) is the logical choice. The MHS facility in Helena is now in the construction phase of being expanded to almost double its current size, and as mentioned above, they already have a William Roy Bandy file. The other leading contender is the American Heritage Center at the University of Wyoming in Laramie.

I have posted an "online" version of this article to one of my download websites. That version includes a number of endnotes and hyperlinks to related information. You can view that version as a PDF at <<https://inlandwyo.com/pub/Breakfast on the Big Horns/>> in the folder labeled "00 Searching for Roy Bandy's 1912 Campsite." Also posted to that site are several of Bandy's recounts of the *Breakfast on the Big Horns* story, unmarked scans of the 1912 images, full-size copies of the other figures presented above, a Bandy manuscript, newspaper and magazine articles by Bandy, a scan of the 1960 Boyd Ridge quad with Roy's markings, old maps, KMZs of points mentioned, tracks of walked routes, and miscellaneous items I came across or generated while researching this little bit of history.

If you find any errors in this presentation or have any questions, suggestions, or criticisms, please contact the writer by email addressed to glenn@inlandgps.com. Make sure to include "Breakfast on the Big Horns" in the subject line.



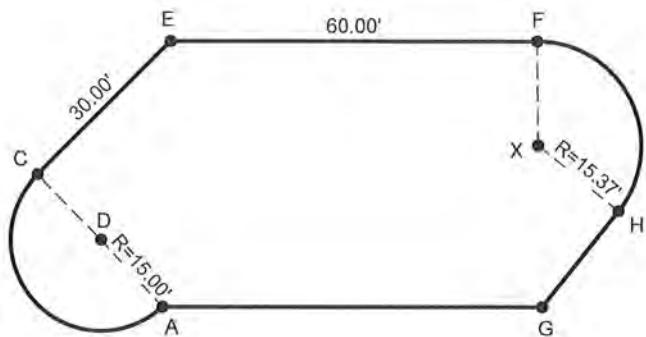
Some Geometry Problems

**Dr. Richard L. Elgin, PS, PE
Rolla, Missouri**

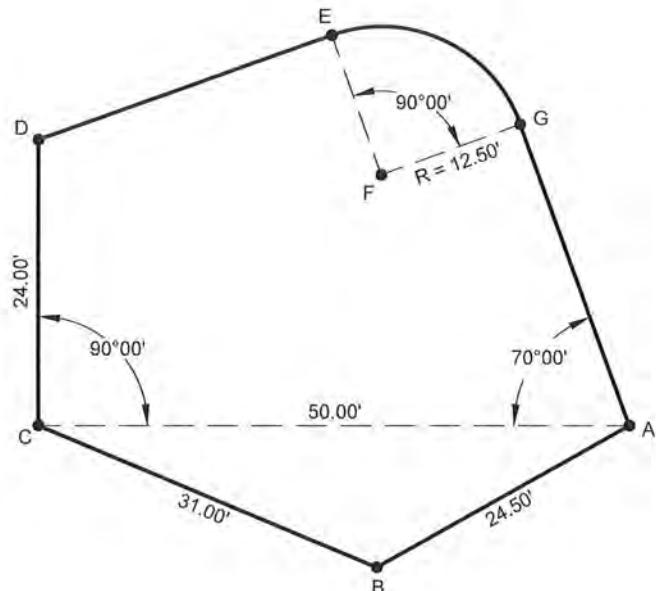
Dr. Richard L. Elgin, PS, PE is a surveying practitioner, educator, researcher, collector and author. He authored the books *The U.S. Public Land Survey System for Missouri*, *Riparian Boundaries for Missouri* and *Shoulda Played the Flute* (memoir of his year flying helicopters in Vietnam). He coauthored the Lietz/Sokkia ephemeris and codeveloped the "ASTRO" celestial observation software products. Dick owns a large collection of early American surveying equipment, rides a Moots bicycle and drives a 1976 Alfa Romeo 1600 GT Junior. He can be reached at: elgin1682@gmail.com

Geometry problems are fundamental to surveying. They involve all aspects of the usual surveying calculation problem such as getting the “picture” of the problem in mind or sketched (somewhat to scale), understanding what is known and what is required, then applying algebra and trigonometry to reach a solution, then considering if the answer seems reasonable. Frequently the solution requires units conversions and an awareness of significant digits. Practicing solving geometry problems seems mundane today, but they are fundamental and should remain an important part of high school mathematics curricula. (IMO: If high schools taught more algebra, trigonometry and geometry and less AP calculus, college students entering surveying and engineering programs would be much better served!) So, here are some geometry problems to challenge those entering or beginning the surveying profession. Handwritten solutions are provided herein.

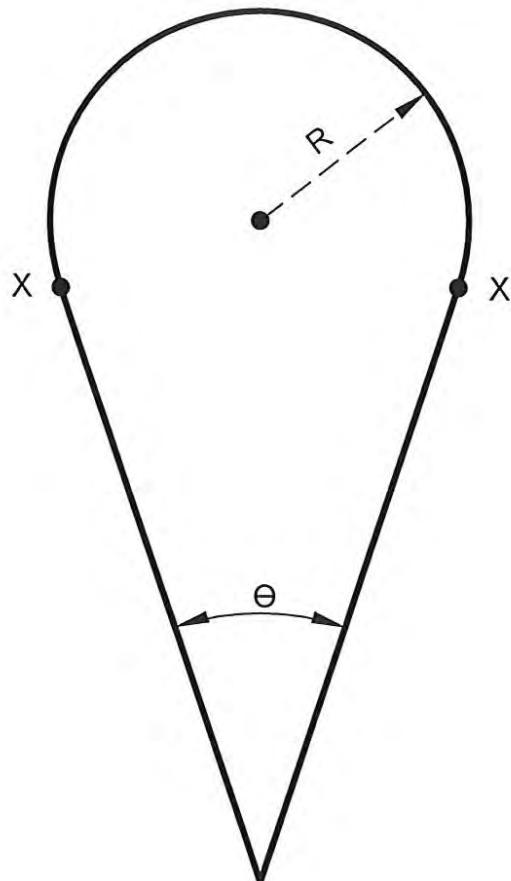
1.) For the figure, compute its area to the nearest 0.01 square foot. Consider the dimensions given to be exact. Lines EF and AG are parallel and the same length. At C, line CE is tangent to the semicircle centered at D, with radius 15.00 feet. Angle FGA is exactly 90° . X is the radius point for circle sector FH. The radius is 15.37 feet. At H, line HG is tangent to the circle centered at X.



2.) For the figure, compute its area to the nearest 0.01 square foot. Consider the dimensions given to be exact. Lines GA and ED are tangent to the circle centered at F.



3.) For the figure, derive an equation for its area as a function of R and Θ . That is: $\text{Area} = f(R, \Theta)$. At X , the line is tangent to the circle. Reduce the equation to its simplest form. [To check your solution/equation, let Θ be exactly 45° and R be exactly 100 feet. If your equation does not result in the area being 43,777.09 square feet, your derived equation is wrong.]





**NSPS
Young Surveyors Network
1st Annual
Young Surveyors Photo Contest
Network**

Young surveyors from all over the country have the opportunity to view beautiful landscapes and deal with interesting situations every day. Some venture to pace footprints where very few has ever been. NSPS YSN would like to share some of those unique looks from around the United States (and beyond) with our members and the public. A wise man once said a picture is worth a thousand words. The other related professionals we work with and the public in general do not see what is involved in surveying. It is up to us to show and educate them how we see the world from a surveyor's perspective.

We need your help in getting the message to the public. A photo contest is just one way we can both show off our favorite surveying pictures and share a taste of what it looks like to be a surveyor. Since surveyors work in the office as well as the field, the contest includes both office and field perspectives. Be creative!

The rules for the photo contest are below:

- ❖ two categories o Face photos
- ❖ non-face photos
- ❖ We will accept photos until our next meeting March 29th 2023
- ❖ Please sign and submit this document with your photos
- ❖ Submit all photos to nspsyounsurveyors@gmail.com with the title YSN Photo Contest.

The photos will be used on YSN social media and our website.

We will select 12 winners to be placed in a YSN calendar.

Voting will be setup in an online fashion with more details announced at our spring meeting in March. YSN Officers reserve the right to remove entries if they are unprofessional.

All entries must be the sole property of the submitter. It is understood that the owner, by entering the contest, grants permission to NSPS YSN to use the photo in their publications either in print or online. Credit will be given to the owner of the photo.

- ❖ Member submitting entry:
- ❖ Company or Agency/Institution:
- ❖ State:
- ❖ Cell:
- ❖ Email:
- ❖ Short Introduction:
- ❖ All entries must be the sole property of the submitter. It is understood that the owner, by entering the contest, grants permission to NSPS YSN to use the photo in their publications either in print or online. Credit will be given to the owner of the photo.

Use separate form for each entry. This form may be reproduced for submitting additional entries. Up to 3 entries is allowed per individual.

❖❖❖

Open letter to MARLS membership

I would like to express my sincere appreciation to MARLS for the support that the membership has given me as one of the two WestFed delegates over all of these years. My time at WestFed has been the most rewarding professional experience of my career as a land surveyor.

I would also like to apologize for not being able to fulfill my duties as WestFed delegate during the past year. I had planned to wrap up unfinished business and say goodbye to long-time friends at WestFed during that year before retiring from the position. Unfortunately, in the spring of 2022, I was notified that my prostate cancer had recurred. The medical treatments and procedures that I've been undergoing since that time have made it impossible for me to travel. I will not be able to attend this year's conference since I am currently in a seven week radiation treatment program that will not finish up until the first of March.

Finally, thank you to Russ Kluesner, who has been doing the work of two delegates by himself to make up for my absence. Thankfully Russ has those big shoulders to help him carry the extra load. My only regret is that I will miss the opportunity to be at the WestFed meetings in support of Russ during his term as WestFed chairman. We all owe Russ a round of applause for being selected as chairman of this amazing organization.

I will not be running for the WestFed position this year due to the uncertainty of my medical condition and also because it is time to pass this honor and opportunity over to another MARLS member. For anyone contemplating running for this position, be aware that it requires a significant amount of travel to attend the three WestFed meetings and also the MARLS BOD meetings, and of course the preparation of reports that you will owe to both organizations. But the rewards far outweigh the work. You will be rubbing shoulders with some of the top survey professionals from each of the western states. Every meeting will be a learning experience, and the after-hours camaraderie will be unforgettable.

I hope to see everyone at the conference next year, and best wishes for this year's conference.

Sincerely,
Dick Smith, PLS

Thank you for Making the MARLS Conference a Success

The 2023 MARLS Conference was a huge success thanks to your participation. Your attendance helps the Montana Association of Registered Land Surveyor achieve its goals while allowing our members to receive valuable networking and resources. We would like to give a special thank you to all who helped our team make this year's convention a great success. Thanks to all our members, speakers, exhibitor, board of directors, committees, volunteers and staff.









In Remembrance of Our Surveyors and Families for the loss of our Loved ones

Michael C. Kaiser, PLS

 Michael C. Kaiser was born in Miles City to Charles and Lorrain (Muggli) Kaiser. He spent his youth in Miles City, attending Sacred Heart School, lettering in football, basketball and track. Mike was a longtime MARLS member and dear friend to all that knew him.

After high school, he enlisted in the Army where he served our country for four years, completing three tours of Vietnam and was awarded the Purple Heart. He attended Northern Montana College for four years and graduated at the top of his class with degrees in Welding, Construction Materials Management, Engineering and Surveying. Many of you may have known Mike more recently as a Certified Land Surveyor. He bought his business from Don Beckman and was the only certified surveyor from Havre to Williston. Mike was a longtime MARLS member and dear friend to all that knew him.

Mike was like a book you were not sure you wanted to read, then could not put down because every chapter got more and more interesting. He loved to read and learn, be challenged and solve problems. His knowledge base was unending, and he could discuss intelligently most any topic –such a bright man and his interests were as varied. He was a licensed pilot, a certified scuba diver, small and large engine mechanic, carpenter, earth moving specialist, inventor and soil tester. Most importantly he had a wicked, dry sense of humor that surfaced when you least expected. He was a prankster and loved to make people laugh.

Mike was a man of integrity, humility and kindness, always ready to help but never taking the spotlight. He was a religious man who did not talk about it, but lived it and believed in leading by example not words. He is the past president of the St. Raphael's Parish Council and was a member of the Glasgow School Board from February 2016 until May 2021.

He is survived by his wife, Jan; son, Tony, daughter, Katie; sisters, Barb (Gary) Fleischer, Cynthia (Mike) Frankovich and Bernie (Warren) Garber; three nieces and one nephew. He is preceded in death by his brother, Edward; father, Charles and mother, Lorraine.

The family requests that memorial donations be made to the Valley County Pool Campaign or the Glasgow High School Educational Trust.

Rosary vigil will be held 6:30 p.m., Monday, January 9, 2023 at St. Raphael's Catholic Church in Glasgow, Montana. Funeral services will be 10:30 a.m., Tuesday, January 10, 2023 at St. Raphael's Catholic Church with Father Jose Valliparambil officiating. Burial with military honors will be at Highland Cemetery in Glasgow, Montana. Condolences may be left for the family at bellmortuarymontana.com

Peter Olsen let us know that our dear friend Mike requested he be buried with his MARLS shirt and bolo tie. Rest in peace Mike.

Morris Zahn, PLS

Morris, our longtime MARLS member passed away recently. Our deepest sympathies to his family.

Alex Ragenovich, PE, PLS

Alex, a longtime member of MARLS recently passed away after a battle with cancer. Alex worked for Morrison-Maierle in their Billings office until 1994, when he came to work for Rocky Mountain Engineers in Bozeman. In early 2007, Alex moved to Stahly Engineering for a few years. At Alex's request, no services are planned.

Richard Heieren, PLS

 It is with deep sadness that we inform you of the death of our friend Richard Heieren. Richard passed away peacefully in his sleep this weekend after a lengthy and hard-fought battle with multiple myeloma cancer. During his 51 years in the land surveying profession, Richard gained licensure in Alaska, Idaho, Washington, and Montana. He also obtained his license as a US Mineral Surveyor. An avid supporter of education, Richard continued his education even after receiving his license by attending Washington State College and Flathead Valley Community College.

Richard believed in service to his profession and community. He was a member of the WestFed Board of Directors from 2009-2017 and served as Chairman from 2013-2015. Richard also served as the Land Surveyor Member of the Alaska Board of Registration where he became involved with NCEES and served on several land surveying committees. Beyond his service to the land surveying profession, he was involved with the Fairbanks Chamber of Commerce, Kiwanis, Fairbanks Salvation Army, Rotary Club, and was also a Board Member for the Marion Weeks and Bill Stroker Charitable Foundations.

Richard leaves behind a large loving family including his wife Amanda Allred, and three children, Matthew CC Heieren of Wasilla, AK, Jacky Smith of Anchorage, AK and Johnny Heieren of Dayton, Washington.

Richard wanted everyone to know that he loved every minute of this great life. In particular, he loved hunting and fishing with friends and family. He said the most rewarding thing in his adult life has been his work with charities in the Fairbanks area and in lieu of flowers, Richard encourages you to give your life to Christ.

Richard will be missed but never forgotten.

The official obituary and a memory wall where you can post will be at the following link: <https://www.merchantmemorialgroup.com/mountain-view-services> Graveside services will be held at Normal Hill Cemetery in Lewiston, Idaho on September 1st at 10:00 AM

Justine Leah Luebke, daughter of MARLS member Kurt Luebke, PLS

With tremendous sadness and broken hearts, we announce the passing of Justine Leah Luebke, 34, of Missoula, MT. Justine passed away on November 16, 2022, in her childhood home, after a 3 year and 9 month hard fought battle with cancer. Justine was born to love, encourage and teach young children but these characteristics bled over into every facet of her life - notably her relationships with family, friends, and her beloved fur babies.

Justine, born to Kim and Kurt Luebke along with her older sister Jennifer, took her first breath on October 13, 1988. She is preceded in death by her grandparents - Art & Gale Davis and Winfred & Joyce Luebke. Justine grew up sledding to the bus



stop, climbing trees, and making dirt and flower potions at her wooded home on Evaro Hill. She attended preschool in a one-room log cabin with a wood stove just one mile from her home. She enjoyed swimming and dance but truly found her calling when she discovered babysitting before she was even old enough to babysit. She began with her mother driving her to gigs and sitting in the next room while she cared for and thoughtfully entertained children who were barely younger than her. Justine babysat her way through high school and college and has been repeatedly hailed as, 'the best babysitter a family has ever had.' This is especially true for the family whose three children she cared for over a span of 17 years, becoming like cherished family to all of them. The highlight of their many summers together was their an annual 18-mile bike trek from Lolo to Florence, affectionately referred to as "Tour de Florence."

After graduating from Frenchtown High School in 2007 she went on to receive her bachelor's degree in Elementary Education from the University of Montana - Western in 2011. In Dillon she lived with her first of three golden retrievers, Splash, in her own little home.

She began her kindergarten teaching career at Potomac School and immediately demonstrated what a dedicated and caring teacher she would be. After three years in Potomac, she landed her dream job as a kindergarten teacher in her childhood elementary school in Frenchtown. While teaching at Frenchtown she earned her master's degree from Western Governors University in 2018. Justine adored all her students and every year invested her own money to ensure all her kiddos had what they needed to feel prepared, comfortable, and loved in her classroom. She bought food for the ones who needed it so they could take it home in the evenings and on the weekends. If their hygiene needs were not being met at home, she would stay in on her lunch hour to wash and fix their hair and make sure their teeth were brushed. Every child in her classroom knew they were important and mattered. Her style of encouraging and loving teaching produced students who looked forward to school every day. Her students loved caring for their class pet turtle, Bubbles. Even during distanced learning Justine's students got to see Bubbles reading books to them and watching chicks hatching on livestream. Justine was deeply saddened when she had to leave her dream job two years into her cancer battle, but she continued to connect with her old students through cards, letters, and videos.

When Justine was not putting her heart and soul into her kindergarten kiddos, she loved being outdoors and you could

find her every summer and winter on a paddleboard, mountain bike, or cross-country skis. As a daughter, sister, friend, and dog momma, Justine was one of the most thoughtful and caring people, not to mention organized. As a child, she happily cleaned her older sister's room when it got too messy. By sixth grade she had her own vacuum and would know if her room had been infiltrated if her vacuum marks had fresh footprints. She could spot a spider from a room away but would call her father or the neighbor to come kill it. She would leave her babysitting homes more immaculate than when she arrived. Her classroom was organized and inviting and a place where parents were thrilled to hear their child had been assigned. She was the first person to pop a thoughtful card or gift in the mail for a special achievement, even while she was undergoing her own treatment. Her golden retrievers, Splash, Zoot & Yeti, were the luckiest animals on the planet; they always had the best food, treats, toys, and beds, the most snuggles and attention and they loved their momma deeply.

In her cancer years, she was admired for sharing her journey with brutal honesty, authenticity, and vulnerability while also finding all the silver linings and positivity she could. She started her journey clinging to the support groups for help and transformed into a huge supporter for others, gaining more friends than one thought possible. Her hope was that by sharing and supporting she could inspire others to do the same and make the world a better place, which she did without a doubt.

She is survived by her parents, Kim and Kurt of Missoula and her sister Jen of Bend, OR. Her Aunts and Uncles, Roger and Nadine Davis (Spokane, WA), Ed and Jill Steffan (Helena, MT), Gary and Vicki Luebke (Fort Wayne, IN), Greg and Terry Luebke (Fort Wayne, IN). Cousins, Brandon and Lisa Davis (Spokane, WA), Kelsey Voss (Spokane, WA), Courtney James (Nashville, TN), Meagan Steffan (Helena, MT) and Molly Steffan (Helena, MT), Kris and Ashley Luebke (Fort Wayne, IN), Taylor and Julia Luebke (Port Huron, MI), and Rikki Luebke (Red Lodge, MT).

A Celebration of Justine's life will take place in the spring at Frenchtown Elementary, with a date to be determined. In celebration of her teaching legacy, we have started a Memorial Scholarship Fund to be awarded to a Frenchtown high school senior aspiring to be an educator. In lieu of flowers, please consider a donation to the Justine Luebke Memorial Scholarship Fund, which can be made payable to Justine Luebke Memorial Scholarship Fund, Frenchtown School District, PO Box 117, Frenchtown, MT 59834.

Published by Missoulian on Nov. 22, 2022.

MARLS website

www.marls.com

MARLS members sign in today!

MARLS members ~ We encourage you to sign into the MARLS members only site to keep you up to date with MARLS information, participation of our MARLS members' discussion board, legislation, meetings, reports and many more currents news and announcements.

We also encourage you to use the MARLS discussion forum to let us know if you have ideas, comments or just want to chat.

Contact Kay at kay@marls.com if you need help signing into the members side of the MARLS website.

A Modest Proposal (No – not that one...)

By: Carl R. C.de Baca, PLS

I think it might time to embrace the end of imperial measurements. Maybe it's finally time to take another run at the meter. After all, we have, in the span of just one generation, eliminated our country's entire identity, uprooted everything that made this country unique and either took it to the attic and stuffed it in unlabeled boxes for some future yard sale, or took it straight to the dump. *Grannie's dead. What are we going to do with all this stuff, none of us want it...* At this point who are we, if not Europeans with funny accents? Don't believe me? Look at what we are wearing and listening to... and driving. 501's, Lynryd Skynyrd and the metallic pea family truckster, are long gone. So long toxic Americana.

Plus, now that Tom Brady has rendered any further mention of the yard, or it's more plebian sidekick, the foot, completely useless, it may, at long last, be time to drop those antiquated units into one of those boxes upstairs and move on with our lives.

From a science standpoint, the conversion will be easy. We surveyors could stop using feet on a Friday and come in the next Monday morning ready to work in mm, cm and m without missing a beat. Oh sure, we would have to change the way we think about gassing up the truck, what with liters being such a tiny little unit of fluid measure, but so what? No, that stuff is easy. It will be harder to wrap our head around the million other things in every day usage that contain imperial measures. Every May, we'll have to get used to thinking differently about both the Kentucky Derby (2.0116 km) and the Indy 500 (804.673km). The Indy 805? Things like that will take some getting used to. 655.80km from Verdi to Wendover? 704.89km from Reno to Las Vegas? Those numbers look funny. But we can get used to them.

On the other hand, the effects of going metric on cliches, metaphors and analogies using imperial standards have largely been ignored. Some work will certainly need to be done in this field. While I could go out tomorrow and perform my next boundary survey using metric measurements, I'm not **sure** how I would feel coming back to the office and describing my day, using the same old tired imperial phrases. We will need to convert these as well.

My client didn't think the old fence was on his boundary line but apparently his neighbor insisted that it was exactly on the line, not 254mm off in either direction. So, there I was, up to my hips in the blackberry bramble, 1.54m south of the fence, staring down at an old iron pipe. It hit me like 907 kg of bricks. I was looking at a fence of convenience – the neighbor's convenience, that is. Oh well, give 'em 2.54 cm and they'll take 1.61 km, I guess. The neighbor's mouth was flapping 160.93 kph. When I suggested that the fence was encroaching on my client's property as evidenced by the original monument at my feet, he threatened to thrash me within 254 mm of my life. As I pounded the 1.219m lath into the ground and wrapped it with a

*meter or so of pink flagging, things got ugly. The neighbor's face looked like 64.3737 kilometers of bad road. He said if I didn't get off his property that very instant, he would bury me 1.8288m deep. He yelled over his shoulder in the direction of his house and out came his spouse, through the ratty screen door and carrying a shotgun. Was it a man or a woman? I couldn't tell. All I know is that inside that flowery frock was 4.54 kgs of s**t in a 2.27kg sack and that gun looked loaded, so I hightailed it out of there. How big was the shotgun, you ask? 37.8333 gauge. Do the math.*



PLS (Professional Lunar Surveyor)

By: Carl R. C.de Baca, PLS

Did you ever look up at the night sky and think to yourself, I wonder what surveying will be like on another planet? I recall that old NASA ad of a surveyor on Mars a few years back. Someday there will a person who can claim to be the first surveyor there, no doubt about it. But what about a little more near-term? How about being a surveyor on the Moon, when they finally build Moon Base Alpha, Craterville, Muskopolis, or whatever the name of the first development may end up being? Imagine how expensive ginneys and hubs will be if they have to be freighted all the way from Cape Canaveral.

The Moon does not have a dipolar magnetic field. No opportunity then to determine a magnetic "north". This Earth-orbiting slab of green cheese takes 27 days to rotate on its axis, so this rotation could be utilized for setting up a basis of directions, so that's good. However, there is no constellation of satellites orbiting the Moon from which an LPS (Lunar Positioning System) could be developed, at least not right now. Therefore, the first surveyors on the Moon, the ones tasked with laying out any non-3D-printed facilities, will need to be steeped in first principals, such as survey astronomy, assuming that is, that NASA or others are developing a lunar ephemeris. The Lunar Surveyor, (Lunodesist?) will be taking star shots and determining azimuths, relative to poles that best represent the lunar rotation.

By the way, how does a total station do at measuring distances in a zero-atmosphere environment? I guess there would be no PPM correction. The Moon has a much smaller diameter than Terra (hey – I'm an old Sci-fi fan), so curvature would play a bigger part in plane surveying. On the plus side, you won't need a machete, or bear spray or snake leggings to do your job. Will there be licensure? I wonder.

You know... it would very expensive to send surveyors to the Moon and bring them back so it might end up being a one-way trip. Of course, the engineers would get to go back home to the main office, but the surveyors would have to stay at the "field office". Their last job would likely be laying out the first lunar cemetery, Moon-Boot Hill, as it were.



Thoughts on Pole Reversal and the Wandering Magnetic North

By: Carl R. C.de Baca, PLS

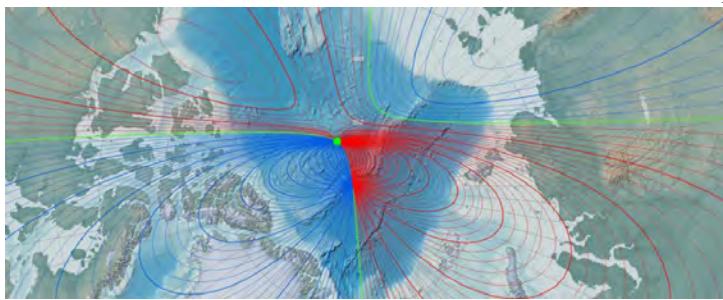
The North and South Poles are swapping places. Hmmmm...



I guess I'm okay with it as long as my Trailer Trash magnet still sticks to the fridge door.

We might need sun block with a UV 500,000 rating since the cosmic rays are going to come on down like contestants on *The Price is Right*.

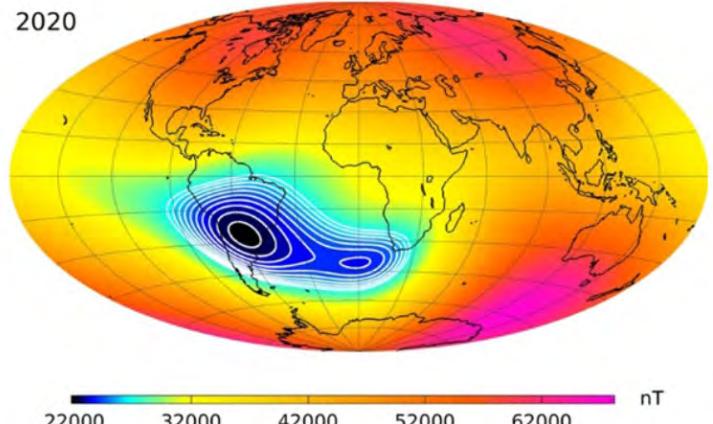
It turns out that Pete Townsend, the genius lyricist and proto-metal guitar shredder anticipated the wandering North Pole as far back as 1966. In the early Who hit 'Substitute' Townsend wrote (and Roger Daltrey sang) "The north side of my town faced east, and the east was facing south". How else to explain this burst of lyrical enigma except by acknowledging that Pete somehow recognized that the North Pole was rapidly heading for Siberia and points south. I mean, really. Otherwise, the lyrics are just gibberish, right?



A cursory search turns up information that the Earth's magnetic poles swap every 700,000 years or so and it's been 780,000 since it last took place. The common thinking by those who get paid to think about these things is that it takes around 20,000 years for the pole-swap process to complete. That concept may be evolving in light of the alarming news that our magnetic field has weakened by some 7% over the past 200 years and new geomagnetic studies are revealing that the swap might happen much faster, say just a few thousand years. And don't forget, the speed at which the North Pole is moving is now upwards of 30 miles a year. That's faster than Joe Biden's thought processes. Whale, sea turtle and bird brains all seem to have built-in compasses that allows them to navigate long distances and still come back home to mate. Whale migrations might be a problem when they start showing up in places like

Baltimore and Sacramento hoping to get lucky and asking for directions to a Cetacean night club. Could whales start evolving thumbs so as to hold on to maps? I wonder.

2020



The European Space Agency's Swarm satellites measure the strength of Earth's magnetic field. In this image, cooler colors (blue) mean lower strength than warmer colors (pink). The large dark region is called the South Atlantic Anomaly.

Finlay et al., *Earth, Planets and Space* volume 72, 156 (2020)

For years scientists have been studying something called the South Atlantic Anomaly (SAA). This is the spot on the Earth where the magnetic field is the weakest. Satellites flying over this area have been bombarded with radiation and one or two have sustained permanent damage and given up the ghost because of it. Down here on Earth, the SAA, as the hip scientists call it, has recently split into two lobes and no one seems to think this is a good thing, though the implications are being downplayed by the same government that said smoking was not harmful, everyone could stand 50 chest x-rays a year, and paper-thin masks made of ... paper could prevent the spread of Covid. Uh huh, right.

So, what's the big deal, you ask? Well, the magnetic field, which extends thousands of miles into space, interacts with charged particles and forms the magnetosphere, which deflects much of the solar winds thereby shielding us from solar radiation. You know, that stuff that makes third eyeballs pop out in frog foreheads, burns that lush mane of hair off your dome and kicks out genetic mutants like Donald Trump and Pee Wee Herman? The prevailing science indicates during the pole swap the magnetic field weakens to nearly nothing and cosmic rays will actually exceed the amount of spam in your in-box. Take a minute and imagine what the folks at the mall, or those cubes in Congress, or even your workplace would look like if the magnetosphere quit doing its job so diligently. Yeah, that's right. They would all look pretty much the way they look right now.

Okay then, there's nothing to worry about. If your isogonic chart needs to be updated every two weeks, so be it. We surveyors aren't exactly relying on our compasses any more. So what if you are driving straight into the setting sun and your car's compass says you are headed south? As long as Google Maps still works, this is a non-problem. Slather on some more sun block and get to work. Private pilots who line their aircraft up on the runway and align their compasses may wonder how to synchronize something that won't stop spinning. And they may end up in Wisconsin rather than Wendover, but that's really neither here nor there. No really, Wisconsin and Wendover aren't either here or there. Think about it.





Montana Association of Registered Land Surveyors 2023 – 2024 Membership Application

Applicant's Name _____
Company Name _____
Home Mailing Address _____
City _____ State _____ Zip Code _____
Work Mailing Address _____
City _____ State _____ Zip Code _____
Daytime Telephone _____ Cell Phone _____
Email _____
Date of Birth _____ / _____ / _____
Montana PLS or LSI License # _____
Send mail to Home _____ Office _____
Are you registered in any states other than Montana? _____ If yes, list: _____

Check Class of Membership Application:

\$230 **Active PLS Member** - Professional Land Surveyor in good standing in the State of Montana.

\$80 **Associate Membership** - Actively training as a PLS under the direct supervision of a PLS and is recommended by a MARLS PLS.

\$190 **Non-Resident PLS Membership** - PLS who resides outside Montana and does not practice in Montana.

\$190 **Affiliate Membership** - Any person in a profession or business associated with the profession of land surveying who is approved by the MARLS BoD.

\$230 **Sustaining Membership** - An individual or institution that desires to assist financially in the work of the Association.

\$125 **Emeritus Membership** - Any person who has been registered in the State of Montana as a PLS, and who otherwise complies with the requirements for Emeritus status as specified by the PELS Board of Registration, State of Montana.

\$20 **Student Membership** - Any person who is enrolled as a student in a higher education surveying curriculum.

I agree to observe the By-Laws of the Montana Association of Registered Land Surveyors and to support it in its endeavors.

Signature _____ Date _____

Make Checks Payable to: Montana Association of Registered Land Surveyors

Visa/MC/D/AE # _____ Exp. Date: _____ / _____

CVVC Code: _____ Billing Zip Code: _____ (4% convenience fee added to credit card payment)

For July 1, 2023 - June 30, 2024 MARLS annual dues: TAX INFORMATION: Federal tax law limits the deductibility of membership dues expended for legislative purpose for 2023 – 2024 MARLS reasonably estimates the deductible portion of your dues to be 90% for tax purposes only. \$10 of your dues is disbursed towards 4 issues published annually of the Treasure State Surveyor magazine for tax purposes only.

Membership applications are available at www.marls.com

Mail application to:

Montana Association of Registered Land Surveyors
P.O. Box 359, Columbia Falls, MT 59912

Phone in at: 406-253-5527 (Kay McDonald)

Email to: kay@marls.com



MARLS Scholarship Foundation, Inc.
P.O. Box 359
Columbia Falls, MT 59912
Phone: 406-253-5527

Montana Association of Registered Land Surveyors Scholarship Foundation, Inc. (MSF)
First Year Surveying Student Scholarship Application Requirements
MSF Scholarship Application must be submitted by August 1, 2023

MARLS Scholarship Foundation has scholarship funds available for students who are interested in pursuing an education in surveying.

A number of scholarships of up to \$2,000 may be awarded for the 2022-2023 school year to students entering the 1st year of a 2-year surveying curriculum or the 2nd year of a 4-year surveying focused curriculum, either of which is recognized by the Montana Board of Engineers and Land Surveyors as meeting the requirements for a person to eventually become a Licensed Professional Land Surveyor. A Montana High School Graduate attending a comparable curriculum at an out of Montana institution will be eligible for a 1st year scholarship, providing they can offer proof that the curriculum meets the requirements for becoming a Licensed Professional Land Surveyor in the State in which the curriculum is offered. A person entering a 4-year curriculum will need to be registered in at least one surveying related course during their 2nd year.

A number of scholarships of up to \$700 may be awarded for the 2022-2023 school year to students entering a curriculum at a Montana Institution which will provide a surveying technician level of education. A number of Montana community colleges and branches of State of Montana Universities may offer surveying technician programs.

Application: Scholarship awards will be determined based on a combination of academic achievement, financial need, work history, course of study, and a submitted essay. To apply for scholarship funds please supply the following information in a neat and orderly format (*It is important for you to recognize that the Foundation takes into consideration how well the requested information is presented*):

1. Type of scholarship being applied for.
2. Full name, address, telephone number, and email address.
3. Description of financial need.
4. Work experience, especially any surveying experience.
5. The name and location of the high school you are attending, or you attended. Include the month and year you graduated or are anticipating graduating. If you are in a 4-year program, provide the name of the institution you are attending.
6. If necessary, provide proof that the curriculum of an out of Montana institution meets the requirements for becoming a Licensed Professional Land Surveyor in the State in which the curriculum is offered.
7. Your high school grade transcript to date. If you are in a 4-year program, your grade transcript to date.
8. The name of the school you are planning to attend or have been attending and the program you will be enrolled in.
9. A one-page essay describing what interested you in pursuing an education in surveying, and your career goals.

Your application packet shall include the following statement along with your signature and the date:

"I hereby certify that all the information on this application is true and correct. I understand that any false information in, or deliberate omissions from, this application may be grounds for rejection of the application and withdrawal of any scholarship award offer. I agree that I will abide by the decisions of the MARLS Scholarship Foundation Board of Directors as they relate to this Scholarship application".

All decisions regarding scholarship awards for the 2023-2024 school year will be made by the MSF Board of Directors. Awards of scholarship funds will be made after receipt of proof of enrollment.

Applications may be downloaded at www.marls.com

MSF Scholarship Application must be submitted by August 1, 2023

Submit application materials to:
MARLS Scholarship Foundation, Inc.
Attn: Kay McDonald
Email: kay@marls.com
PO Box 359, Columbia Falls, MT 59912
Phone: 406-253-5527



MARLS Scholarship Foundation, Inc.
P.O. Box 359
Columbia Falls, MT 59912
406-253-5527

MARLS Scholarship Foundation, Inc. (MSF)
Second Year Surveying Student Scholarship Application Requirements
Scholarship Application must be submitted by August 1, 2023

MSF has scholarship funds available for students entering the 2nd year of a two-year surveying curriculum or the 3rd year of a four-year curriculum with a surveying emphasis.

A number of scholarships of up to \$3,000 may be awarded for the 2023-2024 school year to students entering the 2nd year of a 2-year surveying curriculum or the 3rd year of a 4-year surveying focused curriculum, either of which is recognized by the Montana Board of Engineers and Land Surveyors as meeting the requirements for a person to eventually become a Licensed Professional Land Surveyor. A Montana High School Graduate attending a comparable curriculum at an out of Montana institution will be eligible for a 2nd year scholarship, providing they can offer proof that the curriculum meets the requirements for becoming a Licensed Professional Land Surveyor in the State in which the curriculum is offered. The applicant must be at a minimum currently enrolled in the 2nd semester of a 2-year surveying program or the 4th semester of a four-year program with a surveying emphasis.

Application: Scholarship awards will be determined based on a combination of academic achievement, financial need, work history, course of study, and a submitted essay. To apply for scholarship funds, please supply the following information in a neat and orderly format (It is important for you to recognize that the Foundation takes into consideration how well the requested information is presented):

1. Type of scholarship being applied for.
2. Full name, address, telephone number, and email address.
3. Description of financial need.
4. Work experience, especially any surveying experience.
5. The name and location of the institution you attended for your 1st year (or 2nd year if appropriate) of surveying education.
6. Your post high school grade transcript to date.
7. Name and location of the institution you are planning on attending for your 2nd or 3rd year of surveying education.
8. If necessary, proof that the curriculum of an out of Montana institution meets the requirements for becoming a Licensed Professional Land Surveyor in the State in which the curriculum is offered.
9. A one-page essay describing what you have learned about surveying to date and how that knowledge will assist you in achieving your career goals.
10. A letter of recommendation (sent directly to MSF) from a school counselor or Surveying Instructor who you had contact with at the institution of your 1st year (or 2nd year if appropriate) of surveying education. The letter should include the writer's opinion as to your qualifications, character, and attitude. All recommendations are confidential.

Your application packet shall include the following statement along with your signature and the date:

"I hereby certify that all the information on this application is true and correct. I understand that any false information in, or deliberate omissions from, this application may be grounds for rejection of the application and withdrawal of any scholarship award offer. I agree that I will abide by the decisions of the MARLS Scholarship Foundation Board of Directors as they relate to this Scholarship application".

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MARLS Scholarship Foundation, Inc.
Attn: Kay McDonald
Email: kay@marls.com
PO Box 359, Columbia Falls, MT 59912
Phone: 406-253-5527



MARLS MARKETPLACE

	PRICE	QUANTITY	TOTAL
2017 Montana Road Law Book by Peter Dayton for sale (Hard Copy) 2017 Montana Road Law Book by Peter Dayton for sale (PDF on Flash drive)	\$100 \$80		
MARLS Membership Pin - This pin is a 3/4 diameter gold colored pin with the MARLS logo.	\$6.00		
MARLS Land Survey Monument Sign ~ (Metal)	\$2.75 ea.		
2022 MSSLR Book - 3rd Edition PDF 2022 MSSLR Book on flash drive	\$40 \$20		
Shipping and Handling	Orders to \$30 add \$10 Orders over \$30 add \$20		
TOTAL AMOUNT ENCLOSED			\$
Name:			
Shipping Address:			
Credit Card:			
Expiration Date:			
Mail to MARLS, PO Box 359, Columbia Falls, MT 59912 or email: kay@marls.com or Phone order to: 406-253-5527			

The articles that appear in the Treasure State Surveyor have been selected to assist you in the advancement of not only the profession of land surveying at large, but also in your pursuit to better offer professional services individually, to better your company's integrity level, to hopefully increase your financial success and to promote the public health, safety, and general welfare for your clients. It is time for you to get involved through your articles, ideas and involvement. Please submit your articles of interest, humor and experiences to be included in the next issue of YOUR publication of the Treasure State Surveyor to kay@marls.com.

Stewart Nash's Online Books

To download Stewart's e-books, go to smashwords.com. At the top of the page you can search for books and authors. Type in Stewart Nash. Four novels and one theology book will be seen. Click on the titles to see what it is about and at the bottom of the description are the downloading options. Below those is the historical book titled, John Mullan-Soldier, Explorer, Road Builder.

For his book titled The Last 300 Miles the web address is: <https://www.kobo.com/us/en/ebook/the-last-300-miles>

It is also on Amazon as a Kindle book. This book is under G. Stewart Nash. Please rank the book if you read it.

You can contact Stewart at snash32@citywest.ca for more information on his books.

TO ORDER THE BOOK "The Western Nomad - Memoirs of a Land Surveyor" by G. Stewart Nash, PLS, to order call Kay at 406-253-5527 - \$10 plus S&H.

MARLS LIFE MEMBERSHIP QUALIFICATION

1. Any person who has reached the age of sixty (60) years and who has been an Active Member in good standing for at least fifteen (15) years shall be a Life Member.
2. Any person who is or who has been a Licensed Professional Land Surveyor in the State of Montana for a minimum of twenty-five (25) years and who has been an Active Member of the Association, in good standing, for at least fifteen (15) years may apply for Life membership. Approval of such application must be given by a majority of the Board of Directors.

PLEASE CONTACT KAY MCDONALD
(kay@marls.com) to see if you qualify for life membership

National Society of Professional Surveyors
5119 Pegasus Court, Suite Q, Frederick, MD 21704
Phone 240-439-4615 Ext. 105 - Fax 240-439-4952
www.nsps.us.com
E-mail trisha.milburn@nsps.us.com

To Join NSPS as a MARLS Life members, Fellow or Student members: You are invited to join NSPS with the NSPS membership form at the NSPS website www.nsps.com. Please send your payment and form directly to NSPS for processing.

NSPS - MARLS Joint Membership for all MARLS in-state PLS members: For those members qualified as MARLS instate Active PLS members: MARLS instate Active PLS NSPS membership dues are paid by MARLS annually. MARLS Membership year is July 1 - June 30 of each year. For MARLS new licensed in-state PLS members: NSPS sends our newly MT PLS licensed persons of MARLS instate Active PLS membership category their NSPS new member packets by mail which is also a one year free NSPS membership.



2022 3rd Edition Montana's Subdivision and Surveying Laws and Regulations

Prepared and Published by the
Montana Association of
Registered Land Surveyors

Montana's Subdivision and Surveying Laws and Regulations 3RD EDITION - Published March 2022

Contents:

Montana Subdivision and Platting Act

Uniform Standards

 Uniform Standards for Certificates of Survey

 Uniform Standards for Plats

 Uniform Standards for Monumentation

Montana Sanitations in Subdivisions Act

Sanitation Rules

Corner Recordation Act

Principles, Definitions & Activities

 General Principles

 Geomatics Definitions

 Activities Included in the Practice of Land Surveying

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Montana Land Surveyors Right of Entry

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*Please note: All PLS active members of MARLS have
receiving a complimentary copy from MARLS of the 2022
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Phone order to: 406-253-5527

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Breakfast on the Bighorn numbered prints

The MSF of the "Breakfast on the Bighorn" limited edition number color prints are available for purchase from MARLS Scholarship Foundation. This 250 copy limited edition print has been created from the original painting by Montana artist "Shorty" Shope depicting a Roy Bandy 1912 GLO survey camp. This colorful reflection of surveying in the early 1900's has previously been seen in the "Tiny" Tillotson survey book.

Copies of the print will be available from MARLS Scholarship Foundation in the following form:

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Prints 1 through 15 are reserved for MSF Scholarship auction and special presentations.

Make checks payable to: *MARLS Scholarship Foundation, Inc.*

To mail orders:

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 Attn: Kay McDonald

 PO Box 359

 Columbia Falls, MT 59912

 PHONE order to: 406-892-4579 with credit card

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- ◆ Helping surveyors in need of assistance.
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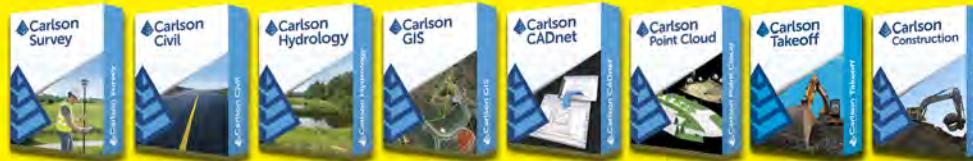
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[Illinois Mutual Quoting Tool](#) can be found on the MARLS website in the member site.

You then have the option of emailing the agent Ray Kojetin at raykojetin@gmail.com with your contact information if interested in this valuable member benefit. You may also view this at www.marls.com in the MARLS member's only site.



The articles that appear in the Treasure State Surveyor have been selected to assist you in the advancement of not only the profession of land surveying at large, but also in your pursuit to better offer professional services individually, to better your company's integrity level, to hopefully increase your financial success and to promote the public health, safety, and general welfare for your clients. It is time for you to get involved through your articles, ideas and involvement.

Please submit your articles of interest, humor and experiences to be included in the next issue of YOUR publication of the *Treasure State Surveyor* to kay@marls.com. Your involvement is greatly appreciated.

This is our challenge to everyone in our Society to share some history and photos for all to enjoy.

Our goal is to print in each quarterly issue a "Survey Monument History Moment" article or any article from our MARLS members. Send your history article to Kay McDonald at kay@marls.com

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