NSPE-PA® LEHIGH VALLEY CHAPTER
PENNSYLVANIA SOCIETY OF PROFESSIONAL ENGINEERS

Lehigh, Northampton, Monroe, and Carbon Counties
(Organized 1935)

Valley Engineer Newsletter

May 2021

PENNSYLVANIA SOCIETY
OF
PROFESSIONAL ENGINEERS

LEHIGH VALLEY CHAPTER
(ORGANIZED 1935)

CARBON, LEHIGH, MONROE, & NORTHAMPTON COUNTIES

President's Message

Alex Dezubay, PE, President

The Lehigh Valley Chapter, Pennsylvania Society of Professional Engineers held its annual Award Ceremony on May 13, 2021. Due to COVID-19 restrictions, it was an outdoor event, at William J. Albert Memorial Park in Catasauqua.

The Engineer's Week Banquet was not held this year, so Engineer of the Year and Young Engineer Awards were presented. Their bios appeared in a previous issue of this Newsletter.

Chapter President Alex Dezubay presenting Engineer of the Year Award to Stephen J. Ressler, P.E., Ph.D., Dist.M.ASCE, F.ASEE

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Chapter President Alex Dezubay presenting Young Engineer of the Year Award to Alexa F. Rooney, EIT, JD

President Dezubay also presented the Truman Yeager Award to Ray Szczucki, PE, for his long-time service as Chapter Treasurer. Ray was unable to attend the ceremony.

The new slate of Chapter officers was sworn in by past-PSPE President John Nawn.

2021-2022 slate of officers: Chapter Directors Frank Walsh and Mary Rooney; Alt. State Direcrtor Angelika Forndran; Secretary Chris Williams; Vice President Alexa Rooney; and President Jeffrey Kutz. Presenting is John Nawn, past-President, PSPE. Absent Treasurer, Ray Szczucki.

The highlight of the evening was presenting $2,500.00 scholarships to four area high school graduates who are enrolled in an engineering caricculum at a college or university. Congratulations are in order for these fine representatives of the new generation of Engineers. Their qualifications are always impressive, and amazing.

Katie Marakovits receiving the award from 2021-2022 LVPSPE President Jeffrey Kutz

Katherine (Katie) Marakovits is the daughter of Thomas and Pamela Marakovits and is graduating from Freedom High School. In the fall, Katie will be attending Pennsylvania State University in the Schreyer Honors College to study industrial engineering as an Impact Scholar. In high school, Katie served as the Student Director, Vice President, and Dance Captain for the FHS Theatre Company, and she performed in more than 22 theatrical productions. Additionally, Katie pursued her artistic passions for ten years as a student at Pennsylvania Youth Theatre, and she earned over 230 hours of community service while volunteering at their Summer Adventure Camp. Katie also served as the Class Historian and School Board Representative for the FHS Student Council, the Historian and a Mentor for the FHS Engineering Girl Power Society, and a dedicated member of the FHS National Honor Society. Katie's love of STEM and engineering originated in her school's Project Lead the Way Engineering courses, and she explored the discipline further at Lehigh University's Summer Engineering

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Institute and as a mentee for the New York Academy of Sciences' 1000 Girls, 1000 Futures Program. Her favorite engineering achievement in high school was competing in the Spellman HV Global Clean Technology Competition with her peers in the FHS STEM Club. Katie has been honored as a National Merit Finalist, Lehigh University High School Scholar, AP Scholar with Distinction, and Hugh O'Brian Youth Leadership Alumna, and she was awarded the University of Rochester Bausch and Lomb Honorary Science Award and National History Day First Place Junior Group Performance Award at the Regional and State Competitions. In her free time, Katie enjoys camping, reading, hiking, traveling, kayaking, tap dancing, and hanging out with friends. She is incredibly grateful to be a Lehigh Valley PSPE Scholarship Recipient!

Caitlin O'Brien receiving the award from Mike Derr, representing the ASCE.

Caitlin O'Brien is the daughter of Sean and Julie O'Brien and will be graduating from Emmaus High School. She plans to attend the Massachusetts Institute of Technology and double major in physics and electrical engineering and computer science. During high school, Caitlin was president of the Science Fair and Science Olympiad clubs and vice president of the Math Club. She was also a staff writer for her school's newspaper, part of the Academic Team, a member of the ACSL Club, and a competitor annually in TSA TEAMS. Additionally, Caitlin led her school's marching band as drum major, and outside of school she was a Girl Scout Ambassador and played competitive club volleyball all four years. The past few years she has also conducted research involving topics such as global warming, photodecomposition, and plastic waste management, and last summer she completed a course in high-performance computing at the University of Notre Dame. Caitlin was part of the National and Tri-M Music honor societies, and she is a National Merit Scholar and National Biology Olympiad Semi-finalist, received recognition from the Society of Women Engineers, earned the PJAS Six-Year Perseverance Award, and achieved Principal's Honor Roll every year. In her free time, Caitlin enjoys drawing, photography, volunteering, and playing video games.

Taran Anantasagar receiving the award from LVPSPE President Alex Dezubay.

Taran Anantasagar is the son of Swathi and Ravi Anantasagar and is the brother of Thwisha Anantasagar. He will be graduating from Parkland High School. Taran is considering several universities to attend in the fall of 2021 and hopes to study Computer Engineering and Computer

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SCHOLARSHIP SPONSORS

A great way to be involved in the LVPSPE Chapter is to contribute to the **LVPSPE SCHOLARSHIP FUND**. Please Contact the Valley Engineer Editor to sponsor scholarships for the remainder of the calendar year.

If you would like to contribute any amount – please send your TAX-DEDUCTIBLE donation to PA ENGINEERING FUND. Donations should be mailed to:

LVPSPE
PO Box 195
Northampton, PA 18067

Please note "LVPSPE Scholarship Fund" on the comment line.

Or, you may also contribute via the LVPSPE website http://www.lvpspe.org/Donations.

Scholarship application is at http://www.lvpspe.org/Scholarships. Any questions regarding scholarships can be directed to

Alex Dezubay, PE
610-597-2007
Scholarship@LVPSPE.org

PSPE SCHOLARSHIPS
The Pennsylvania Engineering Foundation currently administers the following scholarships for engineering students:

Undergraduate
- $1,000 PEF Grant: (two awards)

Upperclassman
- $2,000 Pennsylvania Engineering Foundation Grant

Applications and guidelines are on-line now at http://www.pspe.org/scholarships

2021 – 2022 LVPSPE SCHOLARSHIP DONORS

Graduate
American Society of Civil Engineers
Lehigh Valley ASCE, Bethlehem, Pennsylvania.
Lutron Electronics Co., Inc.
Coopersburg, PA
Victaulic Company
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Senior
FLSmidth, Inc.
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Junior
Barry Isett & Associates
Allentown, Phoenixville, Hazleton, Wilkes-Barre, Mechanicsburg, Wyomissing, Stroudsburg, and Furlong, PA
Mary Rooney/EnviroAce
Allentown, PA
The Pidcock Company
Allentown, PA
Alfred Gruenke, PE
Wescosville, PA
H.T. Lyons
Allentown, PA

Sophomore
Dreyer Consulting
Allentown, PA
Jeffrey Johnson, P.E., FLSmidth Inc
Allentown, PA
Morgan Stanley
Allentown, PA
Hanover Engineering Associates
Bethlehem, PA

Freshmen
Deilen Development
Kohn Engineering
Macungie, PA
Dezubay Engineering Services
Colliers Engineering & Design
Allentown, PA

Contributors
Mike Basta, PE
William Erdman, PE
Keystone Consulting Engineers
Bethlehem, Wescosville, Kresgeville, PA
Ray Szczucki, PE

Alfred Gruenke, PE

Jeffrey Johnson, PE, FLSmidth Inc.

Internet Addresses

National Society of Professional Engineers
www.NSPE.org
Pennsylvania Society of Professional Engineers
www.PSPE.org
Lehigh Valley Chapter – PSPE
www.LVPSPE.org

2020 – 2021 State Officers

State Director
Vacant

Alt. State Director
Angelika Forndran 610-997-6659

VP Northeast:
Marleen Troy, PE, PhD 570-408-4615

Board of Direction Meetings

The monthly Board of Directors meetings are 6:00 PM on the second (2nd) Monday of each month. Open to all members; they are held via Zoom meetings in 2021 until further notice.

2020 – 2021 Chapter Officers

President:
Alex Dezubay, PE
President@LVPSPE.org 610-597-2007

Vice President:
Jeffrey Kutz, EIT
VicePresident@LVPSPE.org 215-325-1303

Secretary:
Chris Williams, PE, LEED AP
Secretary@LVPSPE.org 610-398-0904

Treasurer:
Ray Szczucki, PE
Treasurer@LVPSPE.org 610-614-1245

Immediate Past President:
Brian Kutz, PE
PastPresident@LVPSPE.org 610-997-6659

Chapter Directors:

Frank Walsh, PE
Directors@LVPSPE.org

Mary Rooney, PE
Directors@LVPSPE.org

Alexa Rooney, EIT, JD
Directors@LVPSPE.org

Science. At school, Taran is President of STEM Club and Veg Club. He is passionate about animal rights and dreams of living in a world where animals are no longer exploited for their body parts. Taran is also a Life Scout at Troop 72. He has pursued scientific research and presented his work at various science fair competetions. In the summer of 2020, Taran participated in the Pennsylvania Governor's School for the Sciences, which is a five-week program (online this year due to COVID-19) held at Carnegie Mellon University. During the program, he took nine science courses and worked with a team to develop a machine learning bot to play the card game Eleu-sis. Looking forward, Taran wants to find a way to combine his love for STEM and engineering with his vision for a more compassionate future.

Ankhitha Manjunatha receiving the award from Chris Williams, Secretary of LVPSPE.

Ankhitha Manjunatha is the daughter of Vinutha Chandrashekar and Manjunatha Chinnaswamy and will be graduating from Parkland High School. She plans to attend Princeton University in the fall and major in Electrical Engineering. She is a Captain of the Varsity Debate Team, President of Math League, and is the Vice President of the Future Business Leaders of America Club. She has competed at FBLA Nationals and received awards in the E-Business and Website Design categories. Ankhitha also creates group websites by participating in National History Day and has placed first at the State Competition and won Outstanding Entry at the National Competition. She enjoys conducting scientific research in various areas of physics such as Hofstadter's Butterfly, Transfer Matrix Method, and Finite Difference Time Domain and presented her research at multiple science fairs such as the Intel International Science & Engineering Fair. Ankhitha is a National Merit Finalist, National AP Scholar, and a Lehigh University High School Scholar. Outside of school, she enjoys tutoring students and spending time with her family.

LIME KILNS, THE OLD-FASHIONED WAY

Alfred Gruenke, PE

At a cement plant in Ecuador I experienced an interesting phenomena. On a hillside in the limestone quarry area I saw a waft of smoke coming out of the ground. Upon close inspection I saw that it was a small cave dug into a hillock, with a vertical hole to the atmosphere a few feet into the cave. The smoke was coming from this hole. The front of the cave was almost completely closed.

I inquired as to what this was and was told this was a lime kiln. Crush some limestone ($CaCO_3$), mix in some fuel, set it on fire and let it cook for a week or more. The chemical reaction is simple. $CaCO_3 > CaO + CO_2$, lime plus carbon dioxide, a gas.

Lime has many uses. Spread on the ground it "sweetens" (reduce acidity) the soil. Add water and a coarse sand and it holds

large stones or bricks together. It can be used for tanning, whitewash paint, plus a

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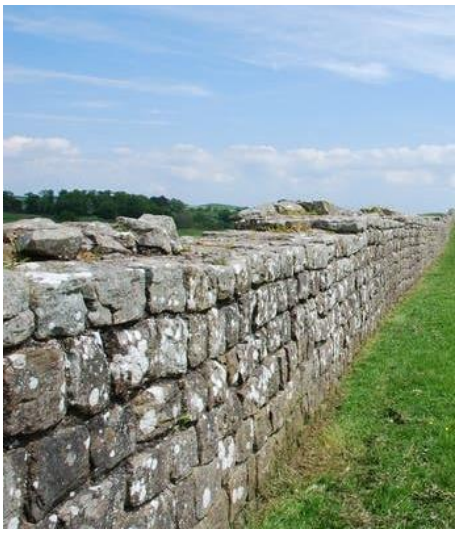
multitude of other uses, including iron production, but it is in agriculture and stone construction that it has historically been most prevalent.

During my research in grist mills I noted that the mill buildings usually consisted of local stones held together by lime mortar. Somewhere in the cobwebs of my brain, I remember a course at Lafayette College during the Johnson administration (Lyndon, not Andrew) that describes the process. Add some water to lime and you get quicklime. $CaO + H_20 > Ca(OH)_2$. Mixed with a coarse sand in the proper proportion and voilà, a bonding agent for stone and bricks. During the "curing" process, which can be years or even centuries, the quicklime combines with CO_2 from the air, sand, and the building stones to form a solid mass. The chemical reaction is $Ca(OH)_2. + CO_2 > CaCO_3 + H_20$. In other words, the lime reverts back to limestone! Horse hair, pig hair, or even human hair was sometimes added as a binder to strengthen the mortar. It's a process thousands of years old. There is archaeological evidence that inhabitants of the Indus Valley in Pakistan and the ancient Egyptians used lime mortar. The Romans seemed to have perfected it, or at least used it to perfection. In November of last year Stephen Ressler gave a presentation on Roman aqueducts. Lime mortar most certainly was used to hold these magnificent structures, as well as the Colosseum, together for thousands of years.

Starting in the late 1900s cement mortar replaced lime mortar. Cement mortar has higher compressive strength, cures faster, and not as caustic as lime mortar. It is seldom used today except to restore structures built with lime mortar; however, lime and lime kilns are an important part of Lehigh Valley history.

Please note that my memory may be lacking. In Wikipedia I found the chemical formula for quicklime, but no formula for the "curing." I've asked a couple of chemists and chemical engineers for clarification but to date no one has stepped forward to assist me. I ask the readers to correct me if necessary; however, this is not an article on chemistry, so we can move on.

So, what is lime, and why has it been so useful in the construction of civilization?



Hadrian's Wall, in England

Lime now is made in rotary kilns similar to cement kilns, but for thousands of years lime was produced by kilns such as these. Unlike iron works or grist mills, lime kilns were rather muted enterprises, consisting of little more than holes on a hillside with a stone front; however, there were lots of them in the Lehigh Valley area, for a multitude of uses. Finding anyone that knows anything about them proved to be most daunting.

My search for information on lime kilns was long and circuitous. Where to start looking for lime kilns? Going to Lime Kiln Road in South Whitehall near the old Parkland High School seemed as if it was a good place to start! Sure enough, about a hundred yards east of Wehr Mill Road, under PPL's 500 kV lines I found it. It's

the largest of the kilns I visited, eight feet high by six feet wide. There is clear evi-

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dence that the limestone came from the adjacent hillside. I have not found anyone that knows the history of this kiln, though it obviously was more elaborate than others in the area. There appears to be a damper above the kiln to control air flow, but I could not find anyone to confirm or refute this. There is a kiln along Rt. 329 just east of Rt. 987 (Frank's Corner) that is well known, but I was not able to find its history. Unfortunately, the informational placard is long gone.

Lime kiln along Rt. 329, a few hundred yards west of Rt. 987.

Lime kiln along Lime Kiln Road.

Lime kiln along Lime Kiln Road.
Note rails on top of chamber.

Going down Wehr Mill Road and River Road I found more lime kilns.

Two kilns along River Road. They are approximately 4' x 4'. Again, the limestone quarry is next to the kilns.

Also on River Road. This could be an old lime kiln, or maybe a pizza oven?

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Sarajane Williams of the Lower Macungie Historical Society referred me to kilns at Camp Olympic near Emmaus. They are well preserved because there is a private home above them. Seems to me they could easily be converted to wine cellars!

At Camp Olympic, near Emmaus. These kilns are 6' x 6'

There were many more. There used to be a lime kiln on the hillside on Keystone Road where Devonshire Road crosses the Little Lehigh, but it collapsed a couple of years ago. Supposedly, there are kilns on Lehigh Parkway but I haven't spent the time to look for them. There is another one along Rt. 222 in Maxatawny Township, but the traffic has prevented me from taking a photo.

And then, on Rich Maiden Golf Course in Berks County, there is a limestone quarry between #12 tee and the green, a par 3.

Limestone quarry, view from #12 tee. Sometimes referred to as "Death Valley". Topographical intimidation at its best!

4' x 6' lime kiln, adjacent to the quarry and #15 green. It is boarded up.

My field work was fine, but I needed information from someone familiar with lime kilns, so I called Stephanie Tashner of the Whitehall Historical Society. She contacted Jeff Donat, who had assisted me researching grist mills. He admitted knowing little about lime kilns but referred me to the 1952 Lehigh County Historical Society Proceedings, Vol. 10. I contacted Don Kohn, PE, for assistance, and he had Sarajane Williams of the Lower Macungie Township Historical Society contact me. She referred me to a book, "A History of Lower Macungie Township" by Ann Bartholomew and Craig Bartholomew. The Lower Macungie Library had a copy, which I borrowed! There are four pages dedicated to lime kilns, including photos of six more Lower Macungie kilns.

Jeff Donat also gave me contact information for Rich Kranzel of Bucks County. Rich gave me first-hand information on lime kilns in the Lehigh Valley. He directed me to a kiln in Springtown, Upper Bucks County, now owned by the Springtown Historical Society. It was recently restored. The quarry was across the street.

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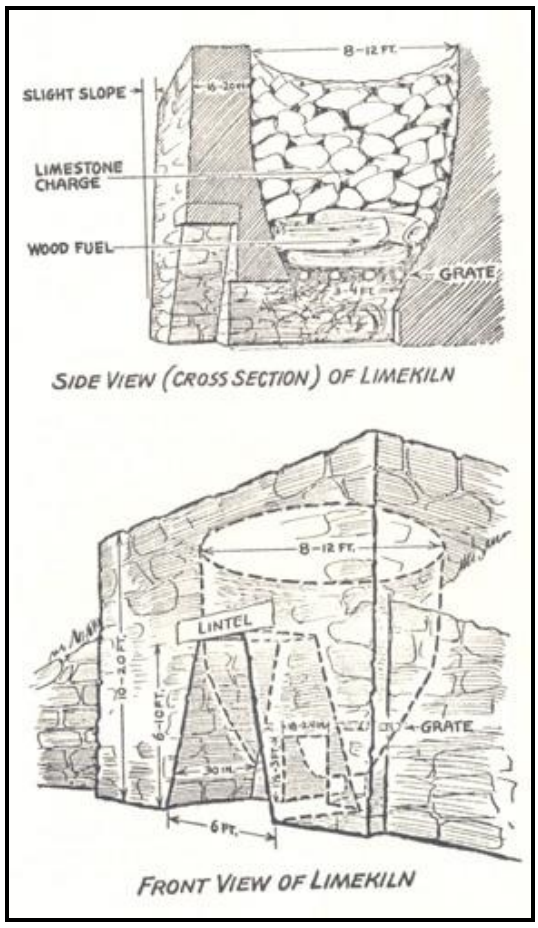
Springtown lime kiln. The opening is 6’ wide by 5’ high. Note the bottle-shaped opening in the rear. The shape of the rear opening is similar to other lime kilns in the area.

There were well over sixty lime kilns built in the Valley from the late 1700s to the early 1900s. Their agricultural purpose ended when commercial fertilizers became available. The kilns ranged in size from three feet high by three feet wide to much larger. The largest kiln I found was eight feet high by six feet wide. The original purpose was for soil enrichment, but the iron industry soon became the primary market for lime. Excess lime was sold to farmers and the construction industry for mortar. Railroads even built spurs to kilns in order to haul the lime to the iron works.

The building of the kilns was usually a community affair involving a number of farmers. They were built into a hillside, usually adjacent to a limestone quarry, though not necessarily so. They have similar characteristics, but the dimensions vary, suggesting that there was no standard plan. Smaller kilns had a semicircular front; larger ones were wide at the bottom, then narrowed down near the top. Limestone feed size ranged from fist size to a foot in diameter. Railroad rails were placed over the opening on top, through which the limestone was dumped into the kiln. Initially the fuel was wood, which was loaded from the front. When coal became available it replaced wood as a fuel. The front was then almost closed to regulate the air flow.

Crystal cave near Kutztown originally was not open to the atmosphere. In 1871 a couple of farmers dynamited a limestone hillside to feed their lime kiln, exposing the cave.

Producing lime required a week to ten days. When wood was the fuel it had to be tended around the clock, which often led to merriment involving strong drink and inebriation. Sometimes carbon monoxide from the kiln seeped out, killing the attendees! Rich said that there are numerous newspaper accounts of such occurrences. Coal did not require such close attendance, and death by lime kiln became rare.



Searching the internet I found very few references to these type of kilns. This is

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the closest I found. There is a frontal chamber under the lintel which I suspect is the fire chamber, a small opening in the rear, then a large chamber above with the limestone. But as Rich said, these were built by individuals, so there were many variations on the theme.

My research into lime kilns did not lead me in a direction I had anticipated. I had expected an emphasis on lime for mortar. Instead, most lime kilns in the Lehigh Valley were primarily for agriculture and iron production. Nevertheless, it was in interesting foray. As one of my neighbors said, "Now that you told me about them, I seem to be seeing them everywhere." And they were everywhere.

Thanks to Stephanie Tashner and Jeff Donat of the Whitehall Historical Society; Sarajane Williams and Don Kohn of the Lower Macungie Township Historical Society; Rich Kranzel of Bucks County; and various people who indulged me traipsing around their neighborhoods taking pictures.

Now some important philosophical questions on life.....

Why do supermarkets make the sick walk all the way to the back of the store to get their prescriptions while healthy people can buy cigarettes at the front?

Why do people order double cheese-burgers, large fries, and a diet coke?

Why do banks leave vault doors open and then chain the pens to the counters?

Why do we leave cars worth thousands of dollars in our driveways and put our useless junk in the garage?

EVER WONDER... Why the sun lightens our hair, but darkens our skin?

Why don't you ever see the headline 'Psychic Wins Lottery'?

Why is lemon juice made with artificial flavoring, and dish washing liquid made with real lemons?

Why is the man who invests all your money called a broker?

Why is the time of day with the slowest traffic called rush hour?

Why isn't there mouse-flavored cat food?

Why didn't Noah swat those two mosquitoes?

Why do they sterilize the needle for lethal injections?

You know that indestructible black box that is used on airplanes? Why don't they make the whole plane out of that stuff?

Why don't sheep shrink when it rains?

Why are they called apartments when they are all stuck together?

If flying is so safe, why do they call the airport the terminal?

Now that you've smiled at least once, it's your turn to spread the stupidity and send this to someone you want to bring a smile to (maybe even a chuckle)...

We all need to smile every now and then.

Never be limited by other people's limited imaginations.
-Mae Jemison

Believe in yourself, even if no one else will.
-Sasquatch

Old age and treachery will beat out youth and skill any time.
-August Polinske

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Minutes for the April 12, 2021 BOARD OF DIRECTORS MEETING
6:00 pm Meeting

Attendees: Al Dezubay, Jeff Kutz, Alexa Rooney, Chris Williams, Mary Rooney, Angelika Forndran, and Ray Szczucki.

Call to Order: Al Dezubay called the meeting to order at 6:08 PM

Discussion:

- May banquet/picnic – 11th or 13th. 13th looks better. What should we budget for costs? Venue in range of $100/$150? Pavilion at North Catasaqua Park could work. Past events have cost $1,476 in 2019 (plus alcohol with 40-45 people, $545 for open bar). Jeff is thinking catering plus self-serve bar, beer, wine, no bartender. We will invite members. Past years open bar w/$35 apiece. We'll invite EOY and YEOY, last year we did two guests free for scholarship recipients.
  - Who will do induction?
  - Will we invite graduate sponsors? ASCE, Lutron and Victaulic. One Sr is FL Smidth.
  - We can each bring beverages.
  - Pick food vendor who can provide vegetarian options.
  - Jeff will put budget together with some options. Probably end up paying around $25/pp.
- Need to update EOY for 2020.
- Al ordered plaques from Gebhardts.
- Received new logos from Jennifer Summers. Provided to engravers.
- Fundraising (Frank Walsh)
  - To date, received $11,150.
  - $1,150 still owed to us from state PEF.
  - Frank handed out list of donors.
- Scholarships (Jeff Kutz):
  - We have 21 applicants, 18 were completed applications.
  - Need to determine how many we narrow it down to, five x $2,000 or four x $2,500.
  - A lot of variation in completeness of applications due to COVID – Missing SAT scores, no class ranks, incomplete transcripts.
  - Let's award $10,000 total.
  - 2pm Zoom call Monday 4/19 to review applications.

- Ray
  - $1,150 expected from PEF.
  - Will follow up with Rose at PSPE regarding Chapter dues.
  - As of 3/31
    - Checking $1,857.54
    - Savings BS $19,665.41
  - Last month received $5,200 from PEF.
  - Going forward, will use Wild Apricot's payment system, so we won't need a PayPal account. Payments thru website will go directly into our bank account.
  - May State meeting is May 15th on Zoom. By 13th, Angelika will have report done with list of activities.
  - Social Media – Jeff posted on LinkedIn about scholarship applications. Will continue posting about events.
  - Nomination Committee report:
    - President – Jeff Kutz
    - Vice President – Alexa Rooney
    - Treasurer – Ray Szczucki
    - Secretary – Chris Williams
    - State Director – Mike Basta
    - Director – Mary Rooney
    - Director – Frank Walsh
    - Alt State Director – Angelika Forndran
    - Past President – Al Dezubay
  - Slate of officers is unopposed;therefore, in accordance with our bylaws, Secretary Chris Williams has cast a single vote for this slate. The slate has been approved.
  - Alexa will investigate a golf outing fundraiser for next year.

Adjournment at 6:57 on a motion by Alexa, seconded by Mary, all in favor.