

THE MIDLAND CHEMIST

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Chair Column – Twenty-Three Down and Two to Go

Robbyn Prange, Chair, Midland Section ACS



Over our 102-year history, the Midland Section has been awarded the ACS’s prestigious ChemLuminary (or Phoenix) Award for Outstanding Performance by a Section 25 times. This is a very impressive track recording considering that these awards have only been around since the 1960s.

The ChemLuminary awards have been around since 1999. Before that, the Phoenix Awards were around from roughly 1960 through 1998, per Wendell Dilling, Midland Section ACS Historian.

Next year, we are planning to display these 25 Outstanding Performance awards in the Central Michigan University Chemistry Department and at our 2022 Fall Scientific Meeting. As of early November, we have accounted for 23 of these 25 Outstanding Performance awards. The un-accounted for awards are out there somewhere. We are searching for the awards for the years 2003 and 2015.

The image at right shows an example of what the ChemLuminary awards have looked like in recent years.



We are asking for the *Midland Chemist* readership's help in tracking down the final two awards so that all of the Outstanding Performance awards can be displayed together. If you have seen the 2003 and/or 2015 awards, or perhaps have one or both of them stowed away in a closet, please reach out to chair@midlandacs.org at your earliest convenience. Thank you.

Midland Section ACS – Outstanding Performance by a Local Section Award Year				
1973	1994	2003 – Need to Find	2010	2016
1990	1998	2004	2012	2017
1991	1999	2005	2013	2018
1992	2000	2006	2014	2019
1993	2002	2007	2015 – Need to Find	2020



Midland Section ACS Officers and Board of Directors Elections Results

Shuting Feng, Chair, Nominations and Elections Committee, Midland Section ACS

The Midland Section ACS election for 2022 Officers and Board of Directors positions opened on Monday, October 11, 2021, and closed on Monday, November 1, 2021. Approximately 24% of the membership participated in the voting process this year.

Congratulations to the following individuals who have been elected for 2022:

- Chair-Elect – Hunter Woodward
- Secretary – Krishnaja Duvvuri
- Treasurer – Elena Montoto
- Chair, Nominations and Elections – Shuting Feng
- Director – Mark Jones
- Director – Michael Coote
- Director – Michael Servinski

You can find the biographical information for each of the elected officers in the [October 2021 issue](#) of the *Midland Chemist*. Thank you to all the candidates and to all the Midland Section ACS members who voted!

Outreach Goes “Orange and Black” for the Season

Gina Malczewski, Director and Outreach Committee, Midland Section ACS

October is always a busy month for Outreach – Halloween provides an opportunity for families to seek fall fun, and National Chemistry Week (NCW) comes just before that on the calendar. This year the Midland Section ACS offered its last two garden-focused events in October as well.

“**Sprouts and STEMs**” was a new program in 2021, built around the just-installed Children’s Garden at Creative 360, supported by a grant from the Midland Area Community Foundation. The garden took a lot of time to develop, so programming did not begin until late August. Next year more will be done outdoors to take advantage of the longer summer light.



“**Colors that Communicate – Plant Pigments**” was offered on October 13, involving activities with chlorophyll, extraction of anthocyanins from purple cabbage, and the use of natural dyes and acid-base indicators (from cabbage, turmeric, and grape skins) to make take-home fabric and paper artworks. The results were beautiful!

The photo at left shows a student’s artwork made using plant dyes on cotton (photo credit, Dave Stickles).

On October 27, our “**Pumpkin Party**” finale featured free pumpkins and items with which to decorate them, pumpkin math and science, spooky storytelling, and pumpkin bingo. Attendees were also treated with cider, donuts, and pepitas (pumpkin seeds).

National Chemistry Week and Halloween were celebrated together with “**Frankenstein Friday**” at Central Michigan University (CMU) on October 29, and at the Midland Center for the Arts (MCFTA) “**Halloween Bash**” event on October 30. At CMU, the campus Museum Studies group collaborated with the ACS to offer slime-making and, celebrating the electricity that produced the event’s namesake, insulating and conducting dough, a plasma ball and Van de Graaff generator activities, and pencil electrolysis with multiple modifications.

The photo at right shows a group gathered around the “electricity” station at CMU for a pencil electrolysis experiment (photo credit, Rebecca Petrone).



The Midland Section ACS also offered an “arachnid station” featuring friendly tarantulas and scorpions, and a “Glow” area with light stick experiments, bioluminescent bacteria (courtesy of Dr. Greg Colores), bracelet-making with UV-activated beads, and a ring toss game under back light using glow rings and “pegs” marked with phosphorescent numbers. Prizes and candy were also available.



The arachnids were also popular at the Halloween Bash, where glow stick and Pop Rocks experiments demonstrated the effects of temperature on chemical and physical changes. A starch-iodine clock experiment “wowed” attendees, and the Belousov-Zhabotinsky oscillating reaction (changing from orange to clear and back over and over) was also a crowd pleaser.

The photo at left shows a very intent young visitor at the “ACS Arachnid Station” at the MCFTA Halloween Bash event (photo credit, Gina Malczewski).

A few additional NCW-associated events continue into November and will be featured next month. Within our local section, the fall of 2021 has provided some colorful science, in addition to brilliant foliage!

ACS Committee on Chemists with Disabilities Promotes Disability Awareness

Steve Keinath, Co-Editor, The Midland Chemist

Editor’s note: The article appended on pages 5 and 6 is reprinted, in part, from the October 4, 2021 (Vol. 99, No. 36) issue of *C&EN*, a publication of the American Chemical Society. Michelle Cummings, Chair, ACS Committee on Chemists with Disabilities, and an active member and leader within the Midland Section ACS, authored the original article.

Many local chemical professionals and active ACS members know Michelle Cummings from her career path at Dow Corning Corporation, and now Dow, and because of her involvement in many Midland local section leadership roles and activities. She has been an ACS member since 2007 and became an active member of the Midland Section right off the bat, holding multiple board and committee positions. Her elected officer positions within the Midland local section include Secretary, 2008-2009; Chair-Elect, 2013; Chair, 2014; Past Chair, 2015; Director, 2016-2018; and Chair, Nominations and Elections Committee, 2019-2020. She is also active in the Midland Section’s Women Chemists Committee, among other local section roles.

At the National level, Michelle is a member of the Divisions of Chemical Health & Safety (CHAS), Industrial & Engineering Chemistry (IEC), and Profession Relations (PROF). In 2017, she received the ACS Division of Industrial & Engineering Chemistry Applied Chemical Technology (ACT) Award.



Michelle Cummings, Chair, ACS Committee on Chemists with Disabilities

As chair of the American Chemical Society Committee on Chemists with Disabilities (CWD), I am excited about the impact that our committee is having on the culture within and outside the society. ACS is recognized as a leader among professional societies in promoting and supporting persons with disabilities (PWD).

As a researcher in industry, I was introduced to CWD through an opportunity to host a summer intern from the National Technical Institute for the Deaf in 2016. That summer was the start of my journey promoting employment of PWD in the STEM field. Since then, I have been active in CWD, and I became its chair in 2021. I am also involved in recruiting PWD for internships as well as full-time employment in industry.

Our committee members come to ACS with their unique experiences and perspectives. All have a passion to promote equity of PWD in the chemistry enterprise. We have been working to complete the goals that were set forth in our strategic plan, which was initiated in 2019. These goals are aligned with promoting awareness of the capabilities of PWD in the chemical sciences, using internal and external alliances to increase CWD's visibility and impact, and serving as a resource for laboratory accessibility and accommodations. An update on progress was recently presented virtually at the ACS Fall 2021 National Meeting highlighting the results of the committee's hard work.

One of the recent CWD achievements is a webinar titled "Service Dogs in Your Chemistry Lab." Presenters discussed accommodations, the definition of service dogs, training, and the relationship of service dogs to owners, as well as legislation. Examples of service dogs enabling employment of PWD are becoming more common as awareness increases and the number of champions advocating this accommodation increases. A replay is available through ACS Webinars at www.acs.org/webinars.

Asking organizations to incorporate successful accommodations for PWD can sometimes seem arduous, but in practice, most accommodations can be seamlessly implemented. From my personal experience, accommodations for persons needing vision, hearing, or mobility assistance have a positive impact on everyone at a minimal amount of expense. I am more effective when a larger font in a presentation makes it easier to read, closed captioning ensures that I hear accurately, and an automatic opening door enables me to pass through when my hands are full. Most people have used these accommodations at one point or another. In the online CWD manual "Teaching Chemistry to Students with Disabilities," numerous other potential accommodations are recommended that can be applied even to STEM professionals.

The committee continues to recognize the need for chemical professionals with disabilities to have role models and a community that understands life's celebrations and challenges. To increase visibility and impact, members of the committee have narrated their personal experiences navigating life with a disability as well as experiences from members that are allies of PWD. These are available by video at www.acs.org/cwd. Watch for additional video postings in the future, including recordings of the ACS Division of Professional Relations symposium "Working Chemists with Disabilities" at the ACS Spring 2022 National Meeting in San Diego.

CWD continues to recognize excellence within ACS through two award programs. The committee's ChemLuminary Award acknowledges the outstanding efforts of a local section or division that supports the mission of CWD "to promote educational and professional opportunities in the chemical sciences and in fields requiring knowledge of chemistry for people with disabilities." The award also recognizes events that enhance the learning of chemistry through the efforts of educators, advocates, and families of people with disabilities. The CWD Travel Award is available to encourage and support the participation of undergraduates, graduate students, and postdocs with disabilities who will present a talk or poster at an ACS national meeting.

Our committee is focusing on both internal and external collaborations to gather and disseminate resources. Internally, we are coordinating with local sections, divisions, regional meetings, and other national committees. If your ACS group would like assistance with accommodations at one of your meetings, please email CWD. We are providing virtual consultation and financial support to teams implementing accommodations at events. Externally, we are developing partnerships with other professional organizations to create and share best practices in promoting and supporting PWD in the chemical sciences.

Our members are passionate and excited about chemistry, and we use our unique skill sets to drive inclusivity throughout the society membership and beyond. We are an enthusiastic group that enjoys personal interactions; feel free to email us to find out more information or share your journey.

CWD invites all individuals with disabilities working or aspiring to study or work in the chemical sciences to contact the committee. We welcome the interest and support of all educators, employers, and colleagues. For more information, please call the Office of Society Services at 800-227-5558, or send an email note to [cwg@acs.org](mailto:cwd@acs.org).

The views expressed in this article are those of the author and not necessarily those of *C&EN*, the *Midland Chemist*, or the American Chemical Society.



The Fifth Quarter: A Fulfilling Retirement Benefits from Staying Connected to the Young

Steve Keinath, Co-Editor, The Midland Chemist

Editor's note: This article is reprinted, in part, from the Thursday, October 7, 2021, issue of *ACS Industry Matters Newsletter*, an online news publication of the American Chemical Society. In this article, Midland Section ACS leader Gina Malczewski shares that a fulfilling retirement involves staying connected to younger people, knowing what you love, and maintaining one's mission and passion for service.

Gina has served the Midland Section ACS in numerous ways and elected roles, always with high energy. She served as the local section Chair in 2012, and again in 2015, plus fulfilling the associated roles of Chair-Elect, Past Chair, and Program Chair before and after each of the Chair officer years. She also served in the elected roles of Secretary in 2014, and Director in 2017-2019, and is currently serving as Director for the 2021-2023 term. During her terms of office as local section Chair, she led the effort to rework and update the Midland Section Handbook. Over the years, Gina has also led or been actively involved with a number of local section committees, including Long-Range Planning, Outreach/Kids and Chemistry, Teacher Support, Scholarship, and the 100th Anniversary celebration which culminated in the construction and display of the local section's centennial exhibit for much of 2019 along with additional, special programs that year. She is also active in National ACS committee work.

Gina has been recognized with a number of awards, including the National ACS Local Section Outreach Volunteer of the Year Award, 2014; Midland Section ACS Science Education Volunteer of the Year Award, 2015; National ACS Helen M. Free Award for Public Outreach, 2015; Midland Section ACS Outstanding Service to the American Chemical Society Award, 2018; and Michigan Governor's Senior Volunteer Service Award, 2019. In addition, she was selected as an ACS Fellow in 2019.



Regina M. Malczewski, ACS Fellow

Gina received a BS in Chemistry from the University of Dayton, a PhD in Biological Chemistry from the University of Michigan, and did cancer-related postdoctoral research at the Michigan Molecular Institute in Midland. She joined Dow Corning in 1984, where she evaluated the biocompatibility of silicones for medical use, developed Si-based substrate binders using biotechnology, characterized the performance of silicones in personal care, tested materials for antimicrobial use and drug delivery, and investigated applications of nano-structured Si materials.

Gina received her secondary teaching certification from Saginaw Valley State University in 2007, which she has used to develop teacher workshops for STEM educators and conduct hands-on science programs.

Active in the Midland Section of the American Chemical Society and at the National level, Gina became an ACS Fellow in 2019. She has made six HELPS International trips to rural Guatemala, helping to install stoves and

water filters, and providing science training to teachers there. Gina and her husband, Frank, volunteer for the local Red Cross. She is very proud of her family, including her three sons.

Did you choose retirement? Or was it chosen for you?

Although I had planned to retire from Dow Corning late in 2013, I left as part of a downsizing program earlier that year.

How was the transition from the working world to retirement?

I had been actively volunteering with the local ACS section for five years at the time of my retirement, so I easily became even more involved, although I also did some substitute teaching for about a year and a half. The transition was not difficult; my husband had retired nine years before, so I had the benefit of his experience to learn from. We were/are financially secure, and I knew I had to stay busy to be happy, so I added to my volunteer portfolio.

Looking back, what do you wish you knew about retirement before you retired?

I don't think I was lacking any particular information at the time of my retirement; planning ahead and watching others can help tremendously. In my mind, one must continue to have a "mission" and I knew I had to find a way to contribute to the greater good.

George Bernard Shaw said, "Youth is wasted on the young." Assuming they would listen, what's your best advice for someone in their 20s or 30s?

As you work and provide for your family, look at the world around you and identify activities and interests that you love or wish to learn more about. Investigate as you have time, so when you become "available" you know where to start.

What do you enjoy most about being retired?

I can control my schedule – I just need to make sure to leave some "down time" to rejuvenate. Expectations seem to be low for retirees, and I think those of our age still have tremendous potential to change the world. Projects involving the young are good for both age groups.

What's the biggest challenge you have confronted to this point in your retirement?

There is sometimes reluctance from others to accept ideas from older folks or to see the value of the experience they may bring to a situation. Patience and role modeling help. When the generations work together, the results can be wonderful.

How do you stay connected to the chemistry enterprise as a retiree?

Besides being very active in our local section leadership, I also work on the scholarship and outreach committees. I am an ACS Science Coach and participate in our local Great Lakes Bay STEM Alliance. The "reboot" of our Midland Section ACS Centennial history exhibit at Central Michigan University is also a current project of mine, and I am a member of the Committee on Community Activities at the National level.

What do you like most about where you are living in retirement? What's one thing you wish you could change about where you live?

Midland, Michigan, and the surrounding communities are interested in science and our STEM collaborations are strong. We have four seasons I can enjoy, and I am near to my three sons and extended family. I also have access to many wonderful activities in this area, including biking on a variety of trails and creative outlets like art and ceramics.

What guidance do you have for people who are getting ready to retire?

Get and stay physically active to maintain your stamina and address your finances to mitigate money concerns. Determine what motivates you and how you can use that to address your “bucket list” or add new adventures. There are so many options, and hopefully you will soon have time to explore them!

Midland Section ACS Scholarship Fund Challenge

Gina Malczewski, Director and Scholarship Committee, Midland Section ACS

The Midland Section of the ACS has been proud to offer scholarships to deserving undergraduate students majoring in a chemical science since 2002. Annually, two to four scholarships are awarded to candidates who have graduated from a high school in one of the Section's five counties (Bay, Midland, Saginaw, Isabella, and Gratiot), are studying at a Michigan university, and are ideally intending to pursue a career in some aspect of chemistry or chemical engineering. Selections are made by a committee and are based on academics, service, and extracurricular contributions, and an essay on the student's sources of motivation as well as future plans.

Awards usually range from \$1,000-2,000, depending on the financial performance of the Midland ACS Scholarship Fund (#399) administered through the Midland Area Community Foundation. A long-standing goal of the Section has been to raise the base amount to \$100,000 to serve more students.

Dr. Wendell and Marcia Dilling (photo at right), both trained chemists and stalwart supporters of our Local Section, are now prepared to help us reach that goal by donating up to \$18,000 as part of a Challenge Grant to the Scholarship Fund, which currently stands at \$64,953.22.

They will match 1:1 any new contributions to the fund at the Midland Area Community Foundation over the next couple of years (\$18,000 X 2 + \$64,953.22 = \$100,953.22).

Please consider contributing to this worthwhile cause. **Your donations will help shape the future of chemistry!** If you have any questions about contributing to the Midland ACS Scholarship Fund, please call the Midland Area Community Foundation at 989-839-9661. Thank you.



An online donation form can be found through the following link:

[Midland Section American Chemical Society Endowed Scholarship Fund #399](#)

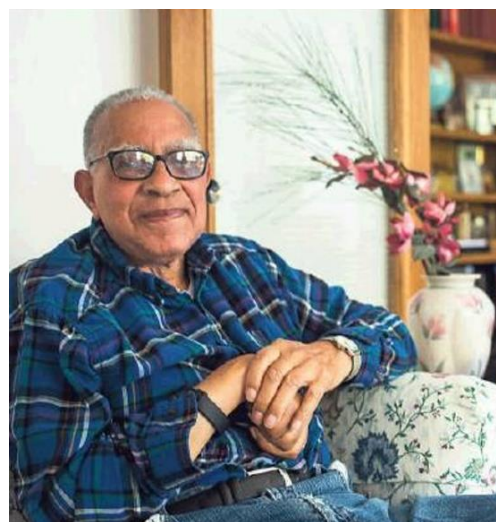
Former Top Dow Chemist Lin Dorman Honored by Midland Area Community Foundation as 2021 Philanthropist of the Year

Steve Keinath, Co-Editor, The Midland Chemist

Editor's note: The article appended below is reprinted, in part, from the Friday, October 15, 2021, issue of the *Midland Daily News*. Tess Degayner (tess.degayner@hearstnp.com) authored the original article for the *Midland Daily News*. Lin Dorman photo credit: Katy Kildee (kkildee@mdn.net).

Some of us longer-in-the-tooth ACS members know Lin Dorman from his long and distinguished career at the Dow Chemical Company. Some of us also know Lin well from his longstanding commitment to and active contributions to the Midland local section. He has been a member of the ACS since 1957, and an active member of the Midland Section since 1966 where he has held multiple board and committee positions. His elected officer positions within the Midland local section include Treasurer, 1966; Secretary, 1967; and 17 years as Councilor, 1971-1976, 1980-1981, and 1984-1992.

In addition, Lin Dorman is the recipient of a couple of Midland Section ACS awards, including the Outstanding Service to the American Chemical Society Award, 1990; and the Outstanding Achievement in the Promotion of Diversity in Chemistry, Related Sciences, and Engineering, 2012.



The Midland Area Community Foundation recognized Dr. Linnaeus, "Lin," Dorman as its Philanthropist of the Year during its annual Ripple Effect event this week at the Nicholson-Guenther Band Shell in Central Park.

Some Midland residents might know Dorman as a "history maker" for his work with Dow Chemical. Others might know him from regularly attending the United Church of Christ on Sundays in Midland.

Dorman retired as a senior associate scientist from Dow in 2000. He was the first Black chemist at the company when he began his Dow career on November 1, 1960. In 1983, Dorman was named Inventor of the Year by Dow. He has been credited with more than 20 inventions and patents in organic chemistry and biomaterials. "At last, the education that my parents had sought for me was complete," said Dorman regarding his career at Dow.

Years ago, Dorman earned the title of history maker when the nation's largest African American historical archive, The History-Makers collection, featured his story. In 2014, the *Midland Daily News* previously reported Dorman's work began with a chemistry set – which was a friend's Christmas gift. "That was my first introduction to chemistry, and I've been associated with the field ever since," said Dorman on the historical archives, which were placed in the Library of Congress reserves in 2012.

In the historical archives, Dorman discusses the value his parents placed on education. He was born in 1935 to parents who started out as rural school teachers who highly valued the education system. Now, Dorman's philanthropy work touches local education systems through various scholarship funds.

Midland Daily News: What prompted your philanthropy work specifically relating to education?

Dorman: “Not every parent was able to save enough money to help them (people interested in attending college) and education seems to be increasing faster than inflation, so without help from other people our kids would not be able to go to school. It pleases me to know that they are taking advantage of opportunities that they have by going to school.”

Some of your scholarships are named after historical figures, such as Martin Luther King and Rosa Parks. Could you tell me about those scholarships?

“They’re my heroes. They did a wonderful thing in their lifetimes that benefits every Black American, so I have the highest regard for their service.”

Midland prides itself as being a city of chemists. As a former chemist who’s still local to Midland, what does ‘City of Chemists’ mean to you?

“Well, it’s interesting that you’re involved in so many things and then you retire. Then, someone else takes your place and progress is made – the company grows. So, it shows you that we’re just ‘a cog in the wheel.’ When you have done your job, you move out of the way and let somebody else continue. That’s what I think about.”

Could you tell me about what Midland was like when you worked at Dow?

“Well, I had a lot of experiences. For one thing, we didn’t develop a ‘ghetto’ where we all lived in the same area, we were more or less scattered throughout the city. And you won’t find many towns in this country like that, most cities are segregated. Fortunately, ours was not. My kids had some problems, but they were able to overcome them.”

What was it like to attend the Midland Area Community Foundation’s Ripple Effect event as an honoree?

“They do a lot of things for the community. They’ve grown and they do a wonderful thing. MACF President and CEO Sharon Mortensen is keeping the foundation in the public eye and a lot of people who’ve gone to work and are now retired are giving to the foundation because it has been successful in its attempt to help the community in so many ways.”

What motivates you to give back?

“I’ve been able to give back much more than I received over a period of time. So, I’m very proud of the fact that I’m helping students who would otherwise not be able to go to school. It does me a lot of good.”

Added notes: Lin Dorman was honored at the Midland Area Community Foundation’s annual “Ripple Effect” event, which took place on Wednesday, October 13, to celebrate local philanthropy efforts.

He shared his memories of the chemistry set with the more than 50 Midland area residents in attendance at the event. The story of his friend’s chemistry set dates back to Orangeburg, South Carolina, where Dorman was born to parents who started out as rural schoolteachers and valued education.

For more on Dorman’s feature in the HistoryMakers collection, please visit <https://bit.ly/3vlfzXu>.

Midland Athletes Medal at Michigan Senior Olympics, Wendell Dilling Brings Home Huge Haul *Steve Keinath, Co-Editor, The Midland Chemist*

Editor's note: The article appended below is reprinted, in part, from an article which was published in the Monday, November 8, 2021, issue of the *Midland Daily News*. Fred Kelly authored the original article for the *Midland Daily News*.

Some of you may know Wendell Dilling from the days of his 30-year career at the Dow Chemical Company (1962-1992) and/or from his follow-on 29-year affiliation with the Chemistry Department at Central Michigan University (1992-present).

Some of us Midland Section ACS members also know Wendell well from his longstanding commitment to and active contributions to the Midland local section. He has been a member of the ACS since 1959, and an active member of the Midland Section since 1962 where he has held a large number of elected Board roles and served in many committee positions over the years, too numerous to list here. At present, he is serving as Director and Historian of the Midland local section. Wendell has been involved at the Regional, Divisional, and National ACS levels as well.

Notable ACS awards that have been bestowed upon Wendell over the years include the Midland Section ACS Award for Outstanding Achievement and Promotion of the Chemical Sciences, 1982; the Midland Section ACS Award for Outstanding Service to the ACS, 1992; ACS Fellow, Class of 2010; and the Midland Section ACS Science Education Volunteer Award, 2018.

Numerous Midlanders competed and earned medals recently at the 2021 Michigan Senior Olympics held at Oakland University and in Sterling Heights.

Wendell Dilling (photo at right, provided by Marcia Dilling) brought home a huge haul, earning gold medals in the hammer throw, the discus, and the 1500-meter run, while winning silver in the shot put, javelin, triple jump, 200-meter dash, and 1500-meter power walk, and also claiming bronze in the long jump, 400-meter dash, and 800-meter run in the men's 85-89 age group.

Rebecca Wieland also brought home some significant hardware, earning gold in the long jump, triple jump, and hammer throw, silver in the 100-meter dash, 200-meter dash, 400-meter dash, and 1500-meter power walk, and bronze in the 50-meter dash and javelin in the women's 75-79 age group.

Tom Veltkamp won gold in the hammer throw and pole vault, silver in the high jump, and bronze in the discus in the men's 55-59 age group, while Willis Pennington earned gold in the javelin and shot put and silver in the discus in the men's 55-59 age group, and Howard King claimed gold in archery barebow recurve in the men's 85-89 age group.



Geoff Brandle took silver in the shot put in the men's 60-64 age group, while Christopher Church won silver in archery barebow recurve in the men's 60-64 age group, and Holt Wilson earned bronze in tennis in the men's 75-79 age group.

Meanwhile, the Silver Linings team of Elizabeth Abbott, Luann Kuznicki, Chris Lade, Jenee Velasquez, Roschelle Houston Cionti, and Nancy McCullick earned gold medals in volleyball in the women's 50-and-over age group.

Over 900 athletes from around Michigan, as well as from other states and Canada, competed in 21 sports during the games. Fourteen of those athletes hailed from Midland. The Michigan Senior Olympics this year doubled as a qualifier for the National Senior Games, which will be held in Fort Lauderdale, Florida, in May 2022.

Added notes: Wendell Dilling was inducted into the Michigan Senior Olympics Hall of Fame in 2020. That story was published in the November 19, 2020, issue of the *Midland Daily News*, and it was also featured, in part, in the December 2020 issue of the *Midland Chemist*. At that point in time, Wendell had won a total of 155 medals. If I'm counting things correctly, he now has an additional 11 Michigan Senior Olympics medals to his credit.

Please see <https://midlandacs.org/newsletter/> to access the December 2020 *Midland Chemist* article.

Life-Giving and Life-Taking Chemistry: Toxic Is Sometimes What You Want

Mark Jones, Past Chair, Midland Section ACS, and Member, ACS Committee on Public Relations and Communications and the Chemical Heritage Landmark Committee

Editor's note: This article is reprinted, in part, from the Thursday, October 14, 2021, issue of *ACS Industry Matters Newsletter*, an online news publication of the American Chemical Society.

It is early September as I write this. The power of chemistry to give life and the power of chemistry to kill are both on display here in mid-Michigan. The corn now stands well more than head high. The tassels are past peak, just beginning to look a little tattered. Fields, orchards, and forests look robust this year. Most corn fields are beautiful, dark green, highlighted by the yellows of tassels and silk.



While most of the corn in the fields looks great, there are exceptions. Sections in some fields recall the best efforts of [Oliver Wendell Douglas](#), short, stunted, and yellow. The importance to life of industrial chemistry is obvious. The yellow, stunted corn is nitrogen deficient. Applied nitrogen fertilizer is missing in those soils due to poor application or standing water. Corn needs nitrogen to support its amazing growth, nitrogen from ammonia produced by the chemical industry. Without it, poorly developed, stunted growth results.

We, humans, require nitrogen, too. We are made of proteins, proteins containing nitrogen. [Half or more of the nitrogen in those proteins](#) come from the industrial production of ammonia. The human population is approximately double what it would be without industrial production of ammonia. [Half the planet's population](#) exists only because of industrial chemistry supplying the ammonia that crops use and we eat.

Chemistry is responsible for life, at least the life of currently living humans. But chemistry can also kill.

Death is also on display here in mid-Michigan. Woody brush along roadways dies horribly at this time of year. It twists and rapidly browns. Note the photo at right of herbicide-killed brush along a road in Midland County. The rapid mid-summer death concerned and saddened me. I was slow to realize what was going on when I first moved here. I later learned it was intentional.



County road commissions in Michigan spray brush near roads with herbicides, most commonly triclopyr. Farmers frequently spray brush on fence lines at the edge of fields. Ditches are sprayed to control cattails and invasive phragmites, a tall wetland reed. Herbicides like glyphosate and imazapyr, with lower toxicity to aquatic species are used. These applications happen on the road edge, making the rapid browning of leaves visible. Vegetation dies where you can see it and the results are persistent. Dead vegetation frequently holds its leaves, grim reminders of life snuffed out.

Michigan tax dollars get spent on other programs that rely on pesticides. The herbicides used for brush control make the killing visible. The results from other applications are less visible. Mosquito control relies on biological treatment of standing water and fogging with non-selective pesticides. I see and hear the fogging, but I don't see the dead mosquitos. I don't see the beneficial insects killed either. I see herbicide use, and the lingering results of it.

The chemical industry frequently takes it on the chin as many rile against chemical use. People complain about toxic chemicals. I don't have much use for toxic as an adjective. Capable of causing harm to people or the planet actually seems to exclude very little. Herbicides are clearly toxic, a use of the word that feels accurate. Herbicides are compounds designed and produced to kill things. Some used in the past were pretty indiscriminate, not good for either plants or animals. Some still in use are acutely harmful to humans, in addition to killing plants.

[Few biological alternatives](#) to herbicides exist and [none with the performance of synthetics](#). Mechanical removal is frequently the next best option, but very energy and labor intensive. Herbicides place us in a sustainability paradox. Spraying wide swaths of the world with the right toxic chemicals may be better than carbon-intensive, soil-damaging alternatives. Herbicides continue to get better. More and more, compounds that interfere with metabolism using pathways unique to plants are used. These herbicides are safer for the environment since interactions with animals are unlikely. The pathways just aren't there. But there are still problems.

I was growing up on a farm at the time glyphosate-based herbicides were coming on the market. Roundup seemed like it was heaven-sent. Compared with previously used materials like paraquat, it was way better. It was not acutely toxic, didn't smell horrible, and lower dosing was required. It was said to degrade relatively quickly in the environment to benign materials. Glyphosate-based herbicides allowed wider use of no-till methods, reducing soil erosion and loss. Use only accelerated with the [introduction of engineered resistance](#). Glyphosate became the most used agricultural chemical by far.

Bayer will [stop selling their glyphosate-based Roundup herbicides for residential use](#) starting in 2023. Bayer states glyphosate remains safe when used correctly. Growing evidence of health concerns are moving glyphosate toward professional application only, still far removed from the list of [banned pesticides](#).

Herbicides, including glyphosate, will be with us for the foreseeable future. Toxic chemicals will continue to be sprayed into the environment on purpose. They're simply too useful. Alternatives are too labor intensive and too costly. We can be certain of two things. First, chemists will continue to make better, safer alternatives. Second, the list of banned materials will continue to grow, in part because better alternatives will be developed, and in part because unintended consequences will be recognized.

Upcoming Dates, Events, and Other Updates

- November 1 (7:00 – 8:00 PM) – Hybrid Midland Section ACS Board meeting, Primrose Retirement Community Clubhouse, 5600 Waldo Avenue, Midland (in person), and via a WebEx conference call connection at [Cisco Webex Meeting - November 2021](#), phone number: 989-633-1166.
- December 1 (7:00 – 8:30 PM) – MSU St. Andrews Family Astronomy Night free virtual event. Presentation topic: Double stars, multiple stars, and star clusters. Please see <https://standrews.msu.edu/family-astronomy-night/> for more information about these ongoing monthly programs.
- December 6 (7:00 – 8:00 PM) – Hybrid Midland Section ACS Board meeting, Primrose Retirement Community Clubhouse, 5600 Waldo Avenue, Midland (in person), and via a WebEx conference call connection at [Cisco Webex Meeting - December 2021](#), phone number: 989-633-1166. For those attending in person, the evening will conclude with an end of year celebration, networking opportunity for new and old board and committee members, and a volunteer appreciation and recognition period. Drinks and appetizers will be provided. For more information, or to help coordinate and facilitate the post-Board meeting activity, please contact Robbyn Prange at chair@midandacs.org.
- January 3 (tentative date) (7:00 – 8:00 PM) – Hybrid Midland Section ACS Board meeting, Primrose Retirement Community Clubhouse, 5600 Waldo Avenue, Midland (in person), and via a WebEx conference call connection at [Cisco Webex Meeting - January 2022](#), phone number: 989-633-1166.
- February 7 (tentative date) (7:00 – 8:00 PM) – Hybrid Midland Section ACS Board meeting, Primrose Retirement Community Clubhouse, 5600 Waldo Avenue, Midland (in person), and via a WebEx conference call connection at [Cisco Webex Meeting - February 2022](#), phone number: 989-633-1166.
- March 7 (tentative date) (7:00 – 8:00 PM) – Hybrid Midland Section ACS Board meeting, Primrose Retirement Community Clubhouse, 5600 Waldo Avenue, Midland (in person), and via a WebEx conference call connection at [Cisco Webex Meeting - March 2022](#), phone number: 989-633-1166.
- March 20-24, 2022 – ACS Spring 2022 National Meeting and Exposition, San Diego, CA. This meeting is being planned as an in-person and virtual hybrid meeting. Meeting theme: *Bonding Through Chemistry*. For more information, please see [ACS Meetings & Expositions - American Chemical Society](#).
- April 4 (tentative date) (7:00 – 8:00 PM) – Hybrid Midland Section ACS Board meeting, Primrose Retirement Community Clubhouse, 5600 Waldo Avenue, Midland (in person), and via a WebEx conference call connection at [Cisco Webex Meeting - April 2022](#), phone number: 989-633-1166.
- May 2 (tentative date) (7:00 – 8:00 PM) – Hybrid Midland Section ACS Board meeting, Primrose Retirement Community Clubhouse, 5600 Waldo Avenue, Midland (in person), and via a WebEx conference call connection at [Cisco Webex Meeting - May 2022](#), phone number: 989-633-1166.

- June 6 (tentative date) (7:00 – 8:00 PM) – Hybrid Midland Section ACS Board meeting, Primrose Retirement Community Clubhouse, 5600 Waldo Avenue, Midland (in person), and via a WebEx conference call connection at [Cisco Webex Meeting - June 2022](#), phone number: 989-633-1166.

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