ROTARY

October 2021

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Rotary

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New members from different groups in our communities bring fresh perspectives and ideas to our clubs and expand Rotary's presence. Invite prospective members from all backgrounds to experience Rotary.

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Rotary

PRESIDENT'S MESSAGE

GREETINGS, MY DEAR CHANGEMAKERS,

A quarter of the Rotary year is now behind us. I am sure you are helping Rotary to *grow more* and *do more*. And I hope you have already done your part for the Each One, Bring One initiative by introducing one person to Rotary.

Do you ever think about your earliest days as a Rotarian? I often do — because those first moments of discovering the power of service shaped who I am today. When I joined my Rotary club, our efforts focused on India's rural communities, where people were living without toilets, getting their drinking water from the same pond they bathed in, and sending their children to outdoor classrooms set up under a tree. The nearest health care provider often was miles away — and the services were inadequate. But after Rotary clubs carried out some service projects, the villages had toilets, clean drinking water, a classroom for early learning, and a nearby health care center.

The spark that Rotary kindled within me forced me to look beyond myself and embrace humanity. It made service a way of life and led me to a guiding principle I still stand by: Service is the rent I pay for the space I occupy on Earth.

If you feel the need to reignite the spark of service in yourself or your club, October — Community Economic Development Month — is a great time to do so. When we work to improve the lives of people in underserved communities — through, for example, projects that provide vocational training and access to financial resources — we help build and sustain local economic growth.

The need is great. According to the United Nations, 9 percent of the world's population — that's 700 million people, a majority of them in sub-Saharan Africa — live on less than $1.90 a day. By supporting strong community development as well as entrepreneurs, we can help improve conditions for people in that region and others.

Your club can also promote economic development in your own community by expanding vocational training opportunities through local schools and community colleges, partnering with lenders to improve access to financial services, or working with a nonprofit that provides resources to entrepreneurs and connects them with the business community.

Of course, developing strong communities is impossible without strong public health. On 24 October, World Polio Day, we'll celebrate our tremendous progress in the effort to eradicate polio. But we also know the fight is not over. We still need your help raising funds and awareness to ensure that all children are immunized against polio. Please don't forget to activate your clubs on that important day and encourage them to donate here: **endpolio.org/world-polio-day.**

Service has been rewarding for me throughout my life. I know the same is true for many of you. Join me this month in becoming a good tenant of our planet by helping others to better themselves and their communities. Together, we can *Serve to Change Lives*.

Shekhar Mehta

President, Rotary International

YOU ARE HERE: Rovaniemi, Finland

THE LANDSCAPE: Rovaniemi, the capital of Lapland, is located in far northern Finland along the Arctic Circle. It is renowned as a place to see the northern lights, also known as the aurora borealis. The town also bills itself as "the official hometown of Santa Claus." If you go, you can visit Santa Claus Village, as well as Arktikum, a museum dedicated to the science of the Arctic region and the history of Finnish Lapland.

THE CLUBS: The Rotary Club of Rovaniemi meets on Tuesdays at 4:30 p.m., and the Rotary Club of Rovaniemi Santa Claus meets on Thursdays at 11:30 a.m.

THE PHOTOGRAPHER: Manu Pajuluoma, Rotary Club of Rovaniemi

ROTARY

October 2021

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October 2021
Vol. 200, No. 4

FEATURES

Noorullah Shirzada

On the cover:
A young girl in Pakistan looks forward to a more hopeful future thanks to Rotary's polio eradication efforts.

Photography by Khaula Jamil/ Courtesy of Rotary International

Biscayne Bay is teetering on the edge of death. Not some kind of metaphorical death. Actual environmental death.

Jeff Greenberg

Illustration by Viktor Miller Gausa

High intensity

GROWING UP in Kitchener, Ontario, Frank Adamson learned to follow his passions. While in high school and college, he worked in various roles at Kitchener Waterloo Hospital. He found he loved being on ambulance crews. Adamson dropped out of college — "It hasn't held me back at all," he says, "I'm into challenges" — and worked as a paramedic.

Over the course of his career, he has served as a chief of paramedic medical emergency services, a vice president of planning and professional services at a community hospital, and a faculty member in a paramedic training program. And he's found the time to open two fitness centers focused on high-intensity resistance training.

Adamson's zeal to help others is matched by his fundraising prowess. A member of the Rotary Club of Fonthill, Ontario, and a past governor of District 7090 (Ontario and New York), he led Pedal for Polio, a district fundraising drive. "I'm out to make a difference with whatever I'm involved in," he says.

— VANESSA GLAVINSKAS

Read more about District 7090's athletic fundraising efforts on page 20.

EDITOR'S NOTE

IN 2007, MY HUSBAND, CRAIG, AND I were living outside Boston, where I worked as a reporter for the *Patriot Ledger* in Quincy. We had both grown up in Wisconsin, and we both were missing it. So when Craig landed a job at the *Milwaukee Journal Sentinel*, we headed back to the Midwest.

Shortly after moving home, I applied for a job at *The Rotarian*. It seemed like a great opportunity to write about people who are making the world a better place (even if I didn't realize quite how far Evanston, Illinois, was from Milwaukee). While waiting to hear if I got the job, I went to India for a friend's wedding, and on a flight in that country, I found a copy of the Indian Rotary magazine in my seat pocket. I took it as a sign — and sure enough, in April 2008, I started at *The Rotarian* as an associate editor.

I knew that eradicating polio was one of Rotary's central missions, but I didn't know much about the disease. During my childhood, I would sometimes travel with my friend Lisa to visit her grandparents in Chicago. Her grandfather, a jeweler named James Hall, walked with braces and crutches because of polio. Imagine my surprise when, as I was looking through back issues of *The Rotarian,* I stumbled across an article in the December 1942 issue about Mr. Hall and the swim club he'd started for people who had been disabled by polio.

I wrote my first big feature, "Follow the Polio Road," in December 2008; since then, polio has been my beat, and I have written scores of stories on the subject. Two in particular stand out for me. In February 2009, I worked with the illustrator Steve Buccellato to create a graphic novel-style feature called "Amazing Stories of Polio!" That led to an event, organized by District 2080 at the National Institute for Graphic Arts at the Palazzo Poli in Rome, that featured the story, which has been translated into several languages and become a primer for people eager to learn about Rotary's work to end polio. And in February 2021, I wrote the cover story, "How We Did It," chronicling Rotary's monumental feat of eradicating wild polio from Africa.

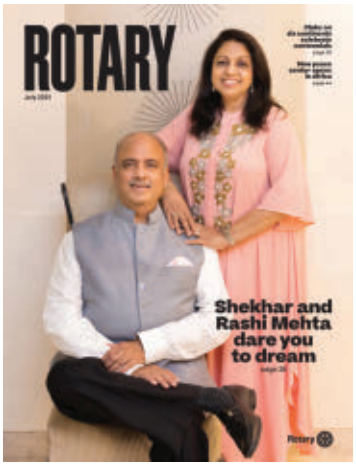
In this issue, you can read a conversation I had in July with Aidan O'Leary, who leads polio eradication efforts for the World Health Organization. O'Leary, who is equal parts optimist and realist, thinks we'll never have a better opportunity to rid the world of polio than we do right now. You can also read about past events that clubs have organized for World Polio Day and hear from donors about why they give to end polio. (Watch Rotary's 2021 World Polio Day Online Global Update at **endpolio.org/world-polio-day.**)

I've covered Rotary's work to end polio for 13 years, but I've never participated in a National Immunization Day, and it's my great hope that I will one day cross that off my must-do list. My greater hope? That I never get a chance to participate in a National Immunization Day — because that will mean that Rotary and its partners have succeeded in ensuring that no child ever again is affected by polio.

DIANA SCHOBERG
Senior staff writer

I knew that eradicating polio was one of Rotary's central missions, but I didn't know much about the disease.

Letters to the editor



ROTARY FIRSTS

In "Rotary's Great Global Leap" [July], you mention that London was the first club established outside North America, in August 1912. The Dublin club in fact was established on 22 February 1911.

— Daniel McAllister, Bradenton, Florida

Editor's note: *The Dublin club organized before the London club; however, its official charter date is later. Rotary's Heritage Communications department considers a club's charter date to be its official anniversary date. The Dublin club received its charter on 1 May 1913.*

SOUTHERN HOSPITALITY

As I was reading the August issue, I was pleased to see the "Star Power" article promoting Space Center Houston. The Houston Host Organization Committee is planning a Space Center Houston event as a way for Rotary members to visit the center. Find information about that event and more at **houstonri2022.org/events.**

— Rhonda Kennedy, chair, Houston Host Organization Committee Sweeny, Texas

WELCOME WOMEN

Regarding "Pioneer Woman" Paula Raposa [July]: The article suggested that women couldn't officially join Rotary until 1989. I joined the Rotary

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Club of Eugene, Oregon, in October 1987. There were several women who joined at that time. I don't think it was illegal. The Supreme Court ruled in May 1987 that Rotary had to admit women, so my club went ahead and moved forward.

— Monta Potter
Monterey, California

Editor's note: *Although women in the United States were no longer restricted from joining Rotary after the Supreme Court decision, their equal status was not yet codified by the RI Constitution. That happened in 1989, making it possible for women worldwide to join the organization.*

MEHTA DATA

"Dream Weaver," the profile of the RI president in the July issue, magnifies Shekhar Mehta. As you read through his accomplishments, you see that his wife, Rashi, played a part in that success. I hope we hear more about her as the Rotary year progresses.

— Sala Sweet
Seattle

You're going to make a great Rotary leader, President Shekhar! Congratulations on your new role. I just completed my year — and what a year it was — as president of the Rotary Club of Missoula, Montana.

— Victoria Emmons
Missoula, Montana

Shekhar Mehta's presidential theme, *Serve to Change Lives*, has really inspired a new generation of Rotarians in the United States and abroad!

— Kathleen Haynes
Falmouth, Massachusetts

President Shekhar is obviously a remarkable man who is making a big difference in this world. Best wishes this Rotary year!

— Jackie Cooper
Columbus, Ohio

NOTORIETY

I can't believe that you published an article about Fall River, Massachusetts ["Can-Do Committees," Our Clubs, July], without any mention of Lizzie Borden, that community's most famous legend!

— Don Slesnick
Coral Gables, Florida

KUDOS

The July issue was another new start for Rotary, with a number of inspiring articles from and about our new RI president, Shekhar Mehta, and his "dare to dream" message. We are so fortunate to continue to tap such inspiring leaders. The magazine did a great job of capturing Mehta's spirit with a collage of fellow Rotarians, colleagues, and family members.

In that same issue, John Rezek's editor's note was especially relevant. He wrote about a colleague who, on his way to be vaccinated against COVID-19, noticed a plaque in a park with a quote by Louis Pasteur. That is no doubt the definition of an epiphany. As Rezek noted, Rotarians' epiphanies are coupled with motivation and determination.

I know how difficult this past year has been, as our club meetings were moved online. We have missed the camaraderie of seeing our Rotary friends weekly. I can't imagine how hard it must be for the *Rotary* staff to publish this high-quality magazine every month, when you are not able to meet in-person.

Which brings me to the letter to the editor from a Rotarian from Cypress, California, that told the editors and staff just how good this magazine is and how inspiring it has been over the years. I add my thanks to you for keeping it fresh and informative.

— Robert Becker
Watervliet, Michigan

Overheard on social media
In our July issue, we profiled RI President Shekhar Mehta.

In reading this article, it's clear that Shekhar is a very special human being and leader. I have confidence that he will hear those promoting positive change to enable Rotary to be more effective and have a greater impact in doing good in the world.
David Charles Egan
Glandore, Australia
▸ via Facebook

Thank you for sharing this. Shekhar is providing inspiration; we can already feel his spirit and optimism. We are going to provide terrific volunteer service within our communities this year.
Rich Salon,
Oilville, Virginia
▸ via Facebook

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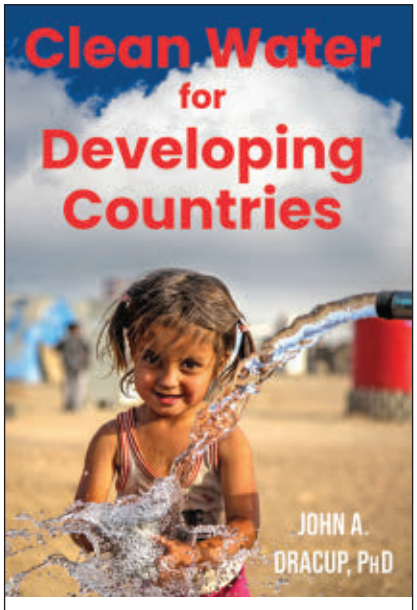

The purpose of this book is to assist the reader in choosing the best method for providing clean water in a developing country. Various approaches are clearly described, and case studies provided, to illustrate the importance of matching need and method when resources are limited.

Dr. John Dracup is a professor emeritus from the University of California, Berkeley.

Learn more or purchase at:
cleanwaterbook.com

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Rotary believes in taking action to create positive change in communities. That's why Rotary members participate in thousands of events around the globe, including the Miles to End Polio bike ride, to raise funds to help eradicate polio and support other causes. Inspiring others and leading by example - that's what people of action do.

Learn more at Rotary.org

Rotary PEOPLE OF ACTION

WE WANT YOUR FEEDBACK

Rotary

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This is your chance to tell us what you like, what you don't like, and what you want from your Rotary membership.

To make sure you receive the survey, update your email address at my.rotary.org/profile/me.

WHAT WOULD YOU DO?

Beneficial to all concerned?

YOUR CLUB PRESIDENT IS on the board of a local organization. The organization wants to partner with your club, but it doesn't have many resources that will enhance your club's projects. In fact, you believe your club would be providing the organization with resources and a network to expand its efforts without reciprocal benefits to your club. Your club president is persistent about creating the partnership and wants you, as service chair, to find a way to make it work. What would you do?

I would look at the purpose for which this partnership was formed. If the purpose falls within one of Rotary's areas of focus and would result in the betterment of lives in our community, I would take up the assignment. In fact, I would be happy if my club's resources helped the partnering organization to improve the skill sets of its members and thus enhance the reach and quality of their service.

However, if the purpose was self-promotion of certain individuals, I would decline the assignment.

— K. Ravindrakumar, Rotary Club of Karur, India

Facts matter. I would ask the club president and board members to form an ad hoc committee to undertake a good-faith exploration of this interesting opportunity. The committee would gather information regarding the proposed partner organization and details of the project, including the plan of implementation, the resources required for the project, and each organization's involvement. The information secured by the committee may settle the matter; as often stated, "the facts speak for themselves."

— John Mulherin, Rotary Club of Glen Ellyn, Illinois

Your club president's other organization does have valuable resources: people. As service chair, I would put together a one-day pilot project that requires lots of people power (clean up the beach, rehab a playground, plant 1,000 trees) to be followed by a potluck. Working together, eating together, and celebrating service to our community together can lead to untold new contacts, new recipes, new Rotary candidates, and new friendships.

— Frank Fagan, Rotary Club of The San Juan Islands, Washington

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It isn't about what it will do for our club. As Rotarians, the real question is: What will it do for the community? Using that criteria, we may well find a good answer.

— Karl Hertz, Rotary Club of Thiensville-Mequon, Wisconsin

Simply put, the club president has a conflict of interest in this matter and should not be part of the decision.

— Linda Weber, Rotary Club of Coshocton, Ohio

Next question

During the COVID-19 pandemic, your club has coordinated its service projects virtually. As more people get vaccinated and case numbers drop in your area, you can start to plan in-person community service projects again. However, there are club members who are immunocompromised or cannot get vaccinated due to other health reasons. How will you plan an inclusive project that takes into account those members who may not be able to participate in person?

What would you do? Tell us at magazine @rotary.org.

Illustration by Martín Elfman

OUR WORLD

ROTARY EXPERTS

A worldwide force of knowledge

Action groups can bridge gaps that may hamper your club's project

AFTER HURRICANES IRMA and Maria devastated the U.S. Virgin Islands in 2017, Rotary members sprang into action. Hearing that a high school on St. Thomas had been badly damaged, Rotarians and Interactors in Ohio worked with their counterparts on the island to develop a global grant project to replace the school's library books and equipment.

When their grant request was denied because it didn't meet The Rotary Foundation's sustainability requirements, the Ohioans, determined to get the details right, turned to a little-known but valuable resource: a Rotary Action Group. Larry Corbus, a member of the Rotary Club of Geauga County (West), connected with Carolyn Johnson, the 2020-21 chair of the Basic Education and Literacy Rotary Action Group. "Larry's club was excited about getting involved in the Virgin Islands and already had made connections with clubs there," she says. "But the club members didn't know how to put the project together. They didn't have the right pieces."

As Johnson worked with the clubs on a community assessment, they learned that the real issue at the school was literacy. She guided them as they researched literacy programs and then wrote another global grant application — which this time was approved. "It's their project," Johnson says. "We just coached them toward asking the right questions so they could find the right solution."

Corbus insists that Johnson's role was instrumental in their success. "We wouldn't have gotten this grant if Carolyn wasn't involved," he says. "It would have been so easy to go in a direction that wasn't sustainable. Carolyn gave us the guidance that sent us in the right direction."

The Basic Education and Literacy Rotary Action Group is one of 27 Rotary Action Groups, independent entities, recognized by Rotary, that have a global network of members who possess expertise and experience in particular areas of service. Those areas — which range from clean water to dementia care to slavery prevention to maternal and child health — sometimes align with the Foundation's areas of focus, though that's not a specific requirement. (The groups, however, are obliged to complement the service activities of Rotarians, clubs, and districts.) Operating like mini NGOs, each action group has its own membership, finances, and board of directors, and brings knowledge, partners, funding resources, and best practices to help clubs scale up their projects for greater impact and maximum sustainability.

"If you want to do a project but don't know how to do it, there's an action group out there that can help," says Nick Frankle, past chair of the Rotary Action Group for Community Economic Development. "If you run into a problem that you haven't seen before, there's someone in an action group who has solved it two or three times. We've got the knowledge. Don't reinvent the wheel — we've got wheels that fit all vehicles."

Action groups grew out of Rotary Fellowships, which create a global community for club members and others with similar vocational, recreational, or cultural interests. Over time, cause-related fellowships began to emerge; their primary purpose was service, and the fellowship was incidental. The RI Board of Directors recognized them as a distinct type of group in 2005.

Find a list of Rotary Action Groups at **rotary.org/actiongroups.**

Photos clockwise from top left: Rotary International; Tadej Znidarcic; Courtesy of Hepatitis Zero; Courtesy of the Rotary Action Group for Reproductive, Maternal, and Child Health

As independent organizations, action groups facilitate partnerships with groups outside of Rotary. The literacy action group, for example, has a partnership with Save the Children. The Environmental Sustainability Rotary Action Group has partnered with the United Nations Environment Programme and with Project Drawdown, a solution-oriented organization that's tackling climate change. And the Rotarians Against Malaria-Global Rotary Action Group works with organizations such as the UN Foundation, PATH, and the Bill & Melinda Gates Foundation.

Initially formed in 2007 as a club and district project to combat hunger and malnutrition, the Food Plant Solutions Rotary Action Group works with more than 30 organizations. Its members, who include agronomists and educators, use a database of 32,500 edible plants to create regional field guides about the growth and nutrition of crops. "Our program partners translate the materials and make them more available and better understood by local people," explains Karalyn Hingston, the action group's executive director.

In addition to offering its expertise, the Food Plant Solutions Rotary Action Group, like other action groups, mentors club members, giving them leadership experience and opportunities to engage with other like-minded individuals at an international level. "Any person who becomes involved with us is exposed to a great mentoring team that can provide a whole range of skills," Hingston says. "We empower people to build their confidence and take on leadership roles. We mentor them so that they can start by doing something incredibly simple and then, over time, take on many aspects of projects. The scope is huge, whether it be administration, agronomy, social media, nutrition, marketing, or graphic design."

Karen Kendrick-Hands was a Rotary Youth Exchange student in 1967-68, and her father had been a Rotarian. So when she was invited to join the Rotary Club of Madison, Wisconsin, in 2012, she was "absolutely all in," she recalls.

The Madison club is one of the largest in Rotary, with more than 400 members. "Do you know how unlikely it was for me to get to a leadership position in that club?" Kendrick-Hands asks. Yet since cofounding the Environmental Sustainability Rotary Action Group in 2015, she has had the opportunity to attend the UN Climate Change Conference in Katowice, Poland, as an observer delegate. She also made a presentation on behalf of the action group to The Rotary Foundation's Environmental Issues Task Force.

Clockwise from top left: The Rotary Action Group Against Slavery hosted a candlelight vigil at the 2017 convention; the Rotary Action Group for Reproductive, Maternal, and Child Health has supported work to advance maternal and child health in Nigeria for nearly 20 years; Humberto Silva helped found the Rotary Action Group for Hepatitis Education; the action group for reproductive, maternal, and child health supports medical visits for women and children.

Those opportunities, Kendrick-Hands says, were "an unbelievable gift. There are times when I look at myself in the mirror and wonder, how the heck did I get here? It's really energizing to be connected and doing something useful with people around the globe" — and, she adds, to be following an unconventional but promising pathway into Rotary leadership.

While most traditional Rotary and Rotaract clubs are by circumstance very local — with members who live or work within driving distance of a club meeting — Rotary Action Groups are intentionally designed to be multinational. Rotarians, Rotaractors, and peace fellows who want to charter a new group are required to

Action groups offer Rotary members an experience that goes beyond their clubs, giving them the opportunity to work on a project at an international level.

have at least 50 members, and those members must come from at least five countries. Also, a minimum of 10 founding members must demonstrate expertise in the proposed group's area of concentration. Action groups offer Rotary members an experience that goes beyond their clubs, giving them the opportunity to work on a project at an international level, and they also provide a meaningful way for nonmembers to participate in Rotary — and perhaps be inspired to join a club.

"If you're passionate about economic development and you become a member of our action group, we'll provide you with education and we'll put you to work," Frankle says. "We'll help you if you're interested in helping others in a way that your club isn't involved in. It allows you to experience something that may be different than the focus of the people around you."

In June, at the environmental sustainability action group's annual meeting (held online), attendees dropped a virtual pin on a map to designate their location. Red dots covered every continent except Antarctica. After six years, the group has nearly 1,400 members, and it's welcoming newcomers at a pace of three to five members a day. "I go to bed at night," says Kendrick-Hands, "and just as I'm turning off my phone, the texts start to pour in from India and Singapore and Australia and Japan and New Zealand. Because somebody is awake and working on environmental sustainability 24/7 around the globe." Multiply that effort by 27 and the combined potential of all of the Rotary Action Groups becomes as promisingly evident as hundreds of bright red dots on a map of the world. —DIANA SCHOBERG

Courtesy of the Environmental Sustainability Rotary Action Group

Karen Kendrick-Hands (center), co-founder of the Environmental Sustainability Rotary Action Group, meets with members of The Rotary Foundation's Environmental Issues Task Force.

By the numbers

25,242
Combined membership of the Rotary Action Groups

150+
Countries where action group members live

709
Average membership of an action group

1,797
Projects supported by action groups

* statistics from 2019-20

Short takes

The 2021-22 RI presidential conference series kicks off 4-5 October in Gyeongju, Korea, with a program focused on disease prevention and treatment and protecting the environment.

In June, the RI Board strengthened Rotary's commitment to diversity, equity, and inclusion by adopting a revised and expanded DEI statement. Read it at **rotary.org/DEI.**

Illustrations by Miguel Porlan

PROFILE

Earth's advocate

Environmental attorney focuses on a green future

Frances McChesney

Rotary Club of Davis Sunrise, California

FROM A YOUNG AGE, Frances McChesney has been an advocate for the environment. As a teenager, she helped to start a Sierra Club chapter at her high school and went before her city council to seek protection for a local green space. "I graduated from high school in 1971, and the open space is still there," McChesney says.

That was only the beginning. As a graduate of the environmental law program at Lewis & Clark Law School in Portland, Oregon, McChesney worked for the U.S. Environmental Protection Agency, enforcing federal and state laws at superfund cleanup sites.

She then returned to her native California, where she spent three decades working for the State Water Resources Control Board, negotiating and coordinating work on key cleanup sites with federal agencies and the responsible parties.

After retiring in 2017, McChesney traveled to Africa with her sister, Barbara, to see wildlife. While there, she noticed Rotary projects throughout rural Uganda. "Then it seemed like I'd see Rotary everywhere," she says. "I was excited to find an organization that called to me."

Both sisters joined Rotary clubs as well as the Environmental Sustainability Rotary Action Group. McChesney has already brought her advocacy expertise to her club's operations: She asked to form an environment committee, which will work to incorporate sustainability into the club's activities and projects.

McChesney is also exploring the possibility of collaborating with clubs up and down the West Coast on an ocean protection project. "We're just taking off with what can be accomplished," she says.

— NIKKI KALLIO

This month, district governors can nominate Rotarians and Rotaractors for the Service Above Self Award. Learn more at **rotary.org/awards.**

After more than four decades, Rotary has returned to Vietnam; the Rotary clubs of Saigon and Saigon International were both chartered in June.

The Rotary Foundation awarded more than 2,000 global grants in 2020-21, a record number.

Photography by Fred Greaves

Rotary projects around the globe

By BRAD WEBBER

Rotarians and Rotaractors proved their mettle and adaptability as they shifted to confront the COVID-19 pandemic. But through it all, they never stopped working toward the goal of ridding the planet of polio. As we celebrate World Polio Day on 24 October, here are some of the ways they did that in 2020.

Register your club's World Polio Day participation at **endpolio.org/register-your-event.**

Canada-United States
When the pandemic leveled restrictions on gatherings and border crossings, District 7090 — which covers parts of southern Ontario and western New York — downshifted plans for its inaugural World Polio Day fundraising bicycle rally. Despite cold and rainy weather on the day of Pedal for Polio, riders on the Canadian side and on the American side completed courses of about 15 miles, says organizer and then-District Governor Frank Adamson of the Rotary Club of Fonthill, Ontario. To expand their fundraising reach, the district encouraged walkers and joggers to join the cause wherever they were located. Rotarians across the district raised more than $160,000.

364,000
BICYCLES SOLD DAILY WORLDWIDE IN 2014

17.5 million
BRAZILIAN CHILDREN GIVEN THE POLIO VACCINE ON A SINGLE DAY IN 1980

Brazil
On 17 October, Brazil's End Polio Now coordinators and public image coordinators organized a nationwide YouTube program dubbed "Telepolio." Featuring prerecorded messages from Rotary leaders and Brazilian celebrities, the 45-minute program generated more than 2,100 views and about $130,000 in donations, made online and through a QR code created for the effort. Members of nearly 300 Rotaract clubs contributed; more than half of those Rotaractors were first-time givers to End Polio Now.

Finland
Over the past decade, some of the planet's most recognizable landmarks have been lit up to mark World Polio Day, with many also sporting a projection of the End Polio Now logo. In 2014, District 1390 enlisted the operator of the Särkänniemi amusement park to promote the message. That year, and every year since, the park has illuminated its 551-foot Näsinneula observation tower with red floodlights on World Polio Day.

Korea
Hiking is a popular pastime in Korea, where more than one-third of citizens polled in 2019 cited sports and fitness as their prime hobby. Rotary clubs in Korea tapped into that mania for the outdoors to raise funds for End Polio Now with the "hiking the 100 most beautiful mountains challenge" in October and November. The event engaged 145 climbers from 74 clubs and garnered nearly $106,000 in contributions. Participants — who agreed to personally donate at least $100 each — teamed up, tackled their favorite mountains, and promoted their achievements by posting pictures and comments on social media. "It is possible to celebrate World Polio Day while following the government's guidelines for social distancing," noted Ju-Hwa Jeong, Rotary's End Polio Now coordinator for Korea.

6,398 ft.

HEIGHT OF HALLASAN, SOUTH KOREA'S TALLEST PEAK

2002

YEAR THE WHO EUROPEAN REGION WAS DECLARED POLIO-FREE

New Zealand
Following the template of mass-transit fundraising drives made popular by clubs in Australia, some 500 Auckland-area Rotary members convened on commuter rail lines and ferries for a polio awareness campaign. The 23 October Polio All Transit event, expanded from a 2019 version that included only train travel, raised roughly $25,000.

1902

YEAR AUCKLAND SWITCHED ON ITS ELECTRIC TRAM

"End Polio Now and Rotary projects can be fun," says Ron Seeto, a past governor of District 9920. "Polio All Transit presented opportunities for fellowship and networking and raised funds with the Bill & Melinda Gates Foundation 2-to-1 multiplier in a project that showcased our Rotarians, clubs, friends, and family."

GOODWILL

Ways and means

Six Rotary members describe how — and why — they raise money for polio

SINCE THE FIRST Rotary-led polio vaccination project in the Philippines in 1979 and the launch of PolioPlus six years later, Rotary has contributed more than $2.2 billion and countless volunteer hours to protect some 3 billion children in 122 countries. As the world nears our goal of eliminating the disease, we asked Rotary members to share why they decided to get involved in the effort — and how they've stepped up to do their part.

The major donor

Ten years ago, Nigeria held the unfortunate distinction of having more than half of the planet's polio cases. "Many of my age-mates, friends, and schoolmates were infected by the poliovirus," says Sir Emeka Offor, a member of the Rotary Club of Abuja Ministers Hill. As a young man, Offor pledged that one day he would help them — and also would do what he could to prevent others from becoming infected.

Offor rose to great success in the business world, enabling him to carry out his pledge in an impressive fashion. A member of the Platinum Trustees Circle of the Arch Klumph Society and the largest donor to The Rotary Foundation from Africa, Offor thrilled those in attendance at the 2014 Rotary International Convention in Sydney by announcing a $1 million donation to PolioPlus (his contributions now total more than $3.3 million). "I can say that it pays to give," he says, citing the World Health's Organization's August 2020 declaration that Nigeria, along with the entire African region, was free from wild poliovirus.

The shop stewards

Recruited to lead the End Polio Now campaign for District 1110 (part of England and the Channel Islands), Jannine Birtwistle and her husband, Paul, got down to business. Despite having no retail experience, the Birtwistles, both members of the Rotary Club of Guernsey, studied up on branded merchandise, and at the 2010 Rotary in Great Britain and Ireland conference, they dazzled delegates with an array of shirts, hats, balloons, pens, and piggy banks. Since then, the online End Polio Now Shop Guernsey, which ships globally, has generated more than $40,000 for polio eradication. "People love the teddy bears, the pens, the badges, the clothing," Birtwistle says. "We can all do one thing, and that is to raise awareness."

The polio survivor

In 1956, at age 8, Urs Herzog contracted polio. Cruelly, that happened around the same time that the polio vaccine was introduced in his native country of Switzerland. Hospitalized for eight weeks with no contact with his parents, he recalls, "was like being in a prison." Today, Herzog is a member of the Rotary Club of Allschwil-Regio Basel and a past governor of District 1980.

Driven to help avert future cases, he has organized End Polio Now events, including a 2015 concert by the Basel Chamber Orchestra, billed as "Music for Life," which drew an audience of 1,400 and raised about $300,000.

The thrill-seeker

A believer in using challenges — and flights of fancy — to stave off "donor fatigue," Jeffry Cadorette, a past RI director and a member of the Rotary Club of Media, Pennsylvania, plunged two miles from an airplane on 22 May. He joined Tony Marmo, governor of District 7210 at the time, in the "Drop to Zero" skydive, which elevated polio giving in Zones 28 and 32 to more than $2.5 million during the period from July 2019 to April 2020 (the parachute drop itself was postponed a year due to the pandemic).

Also, as a district governor in the late 1990s, Cadorette nudged Rotarians in the Philadelphia area in a fundraising effort that resulted in a donation of $100,000 to PolioPlus.

The trekker

To raise funds for, and awareness of, polio eradication, Owen P. Standley of the Rotary Club of Johnstown Sunset, Pennsylvania, set his sights on hiking the 2,200-mile Appalachian Trail from Georgia to Maine. He posted video testimonials from polio survivors on social media "to put a face and a voice" to the issue, and set out in early 2021. Overeager and lonely, Standley, 34, was thwarted by injury and illness after 28 days and 428 miles on the trail, but not before collecting nearly $40,000 through the Raise for Rotary online platform, an amount that had grown to more than $55,000 by August. He is considering a return to take care of unfinished business, so long as he can find one thing: "It's incontestable," he says. "I need a hiking partner."

The hair guy

For nearly a dozen years, Fred Heitman has put his hair and beard on the block — to be colored orange, green, or suitably purple — to generate buzz among Interactors and raise, over the course of 11 years, about $100,000 for polio eradication. As many as 600 high schoolers participate in the Interactors' annual conference with the aim of raising $1,000 "so the guy dyes his hair," says Heitman, a past governor of District 6780 and a member of the Rotary Club of Oak Ridge, Tennessee.

— BRAD WEBBER

IN 2020:

2,000+
Clubs in 145+ countries organized awareness and fundraising events

$750,000
Was raised in online donations

900+
Media articles mentioned Rotary and World Polio Day

227,000+
Views of Rotary's World Polio Day Global Update were recorded

GIVE US YOUR BEST SHOT

The *Rotary* magazine photo awards let you share your vision with Rotary members around the world. Enter for the chance to see your work published: The 2022 photo awards are open for submissions **1 October through 15 December 2021.**

For details go to **rotary.org/photoawards.**

ROTARY magazine

2021 submissions, from top:
WAYNE YAN / GEERT LENSSENS / SHAHRIAR FARZANA

Free your mind

To be creative, you must be open to making connections — and to doing nothing

By Frank Bures

SPENCER SILVER LIVED just across town from where I sit typing this in Minneapolis. The 80-year-old chemist died recently. Silver's name may not be familiar to you, but his work has touched your life. And it offers lessons for all of us about what it means to be creative.

In the late 1960s, Silver was trying to come up with a strong glue that could be used in aircraft. Instead, he accidentally came up with the opposite: a weak glue that could be reused over and over.

Rather than seeing this as a failure, he saw the potential in his discovery. Silver promoted it within the company where he worked; for years, he gave talks about it. Finally, someone else came up with an application — a "reusable bookmark." But it was still several more years before the first Post-it Notes went on sale.

It was a creation that has, to some degree, changed the world.

The history of the Post-it Note challenges many of our beliefs about innovation, creativity, and even genius. When we think of those words, we might picture a lone inventor in a darkened room using the formidable powers of his or her mind to come up with something astonishing, something the world has never seen.

Silver was not like that. In fact, few creative people are. Craig Wright, author of *The Hidden Habits of Genius*, writes that a chemist colleague once told him, "Scientists don't have 'eureka' flashes. Rather, they experience 'My, that's strange' moments."

Wright is a musicologist who teaches a popular "genius course" at Yale University. He points out that geniuses often don't have high IQs or get perfect grades, and that their insights are often years, not seconds, in the making. "That 'aha' moment," he writes, "is really the culmination of a lengthy period of cerebral gestation."

He also notes that the core of creativity is not so much inventiveness as it is the ability to make connections. According to Wright, "the genius sees things others do not," a sentiment Steve Jobs echoed. "Creativity is just connecting things," he quotes Jobs as saying. "When you ask creative people how they did something, they feel a little guilty because they didn't really do it, they just saw something."

The ability to see new connections, to imagine things that aren't there, and to cast our minds into the future is the hallmark of our species and the reason for our success — at least that's what the anthropologist Agustín Fuentes argues in his book *The Creative Spark: How Imagination Made Humans Exceptional.* "Two million years ago," Fuentes writes, "our small, naked, fangless, hornless, and clawless ancestors with a few sticks and stones surmounted near impossible odds. All because they had one another and a spark of creativity."

Fuentes continues that "no other animal in the wild, not even chimpanzees, can look at a rock, understand that inside that rock is another more useful shape, and use other rocks or wood or bone to modify that rock."

As a writer, I often feel a little like someone who is trying to peer inside a rock. Among the challenges of writing for a living, this is one that no one ever told me about: maintaining your creativity.

In certain industries, it has become popular to describe oneself as "a creative." But creativity, in my experience, is something that you attempt and, if you're lucky, achieve, rather than something that you are.

How does a person go about attempting creative work? In one sense, it simply entails coming up with something new. That's what the psychologist Mihaly Csikszentmihalyi calls "personal creativity," which can make life more interesting and meaningful.

But then there's "cultural creativity," which is when you contribute something new to your domain — whether it's art, science, or business — that somehow changes that domain. Geniuses are those who, by luck or circumstance, contribute something that changes the larger culture. "Innovation," meanwhile, could be defined as the ability to turn creativity into real-world products.

So the question is: How do

Frank Bures is a longtime contributor to *Rotary* and the author of *The Geography of Madness.*

Illustrations by Masha Krasnova-Shabaeva

we come up with new things?

In the early 1990s, Csikszentmihalyi conducted a years-long study of 91 "exceptional individuals" — scientists, artists, and others who had made major contributions to their fields, including 14 Nobel Prize winners. They sat for extensive interviews on video that were later analyzed for common themes.

One thread that emerged was that measured intelligence is not a primary factor in creativity. In his book *Creativity: Flow and the Psychology of Discovery and Invention*, Csikszentmihalyi writes that IQ tests tend to measure "convergent thinking," or a person's ability to solve "well-defined, rational problems that have one correct answer." Creative people, on the other hand, engage in "divergent thinking," which involves the ability to think of many possible, but not strictly necessary, answers to a problem.

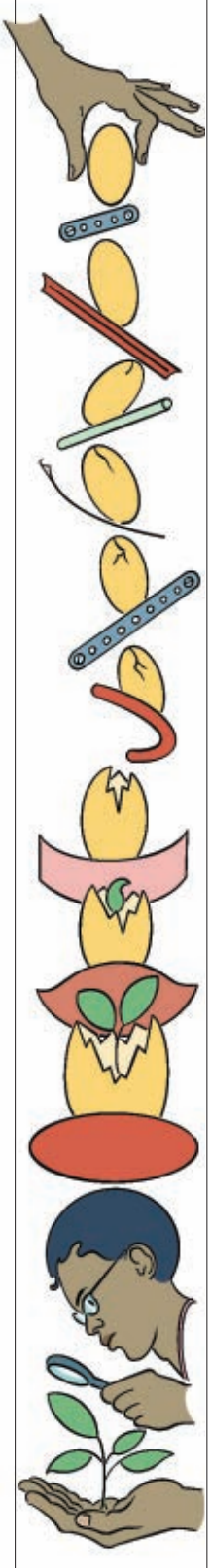
At the same time, Csikszentmihalyi says, you must be able to sort your good ideas from your bad ones. This has been a personal weak spot. I'm currently working on roughly four dozen stories and projects in some form. They all seemed AWESOME when I first came up with them.

They are not all awesome. I just can't quite tell which ones are worth saving until weeks, or sometimes years, later. During the pandemic lull, I culled my files, discarding notes on things I realized I would never write about — nanotechnology, nuclear fusion, and Mormon romance novels, to name a few.

Knowing what you don't want to create is a big step toward creating what you do want. But creativity isn't simply a matter of coming up with new ideas. According to Csikszentmihalyi, that's just one of five phases of creative work.

The first phase is what he calls *preparation*. In this stage, you immerse yourself in a particular problem or a field of knowledge. Then comes *incubation*, a mysterious process in which "ideas churn around below the threshold of consciousness." This is a key period in which your mind is not actively trying to solve the problem. In the best-case scenario, incubation leads to the third phase: *insight*. Wright, in a chapter titled "Now Relax," observed that painter Grant Wood said all his really good ideas came while he was milking a cow; Nikola Tesla thought of an electric motor — one that is still in use — while walking through a park reciting poetry with a friend; J.K. Rowling dreamed up Harry Potter while sitting on a train with nothing else to do.

But that only gets you partway there. Next comes *evaluation*, in which you decide whether your insight is worth keeping. Csikszentmihalyi calls this the most emotionally difficult part of the process. And finally, there's *elaboration*. This is the work, the 99 percent of genius that Thomas Edison spoke of. If you believe him, it means that the first four phases together make up just 1 percent of the process.



In reality, of course, creativity is never so neat as five distinct phases. It's messy and recursive and hard to control. But it's also how the world — and life — gets better. And there are things you can do to improve your odds of achieving something creative in your own life, in your work, or in your Rotary club.

In her book *Genius Unmasked*, Roberta Ness lists 11 "devices" used by scientific geniuses. These include finding the right question, observing, changing your point of view, broadening your perspective, and "frame shifting." Most of the devices involve attempting to see things differently. Wright also points out that "most invention comes from observing disparate things and seeing an unexpected relationship between them."

To do that, you have to find a balance between relaxation and concentration. Wright says you may need to erect an imaginary "fourth wall" against distractions and intrusions, like the one actors use on stage to separate themselves from their audience. If you want to be creative, first you have to create a space in which new ideas and connections can emerge. Csikszentmihalyi notes that "constant busyness is not a good prescription for creativity"; in fact, distraction and an inability to focus are some of the main obstacles. Creative people often devote much of their energy to protecting their attention, saving it for what they really want to spend it on.

"It takes a lot of time to be a genius," Gertrude Stein wrote. "You have to sit around so much, doing nothing, really doing nothing." In the end, the secret to being creative may not be the courage to do something new. It may have more to do with the courage not to do anything. ■

The core of creativity is not so much inventiveness as it is the ability to make connections.

SHEKHAR MEHTA'S PRESIDENTIAL INITIATIVES

Rotary International President Shekhar Mehta has three special initiatives for the 2021-22 Rotary year aimed at expanding our impact through service and introducing new members to Rotary:

EMPOWERING GIRLS

To address the inequities that girls face worldwide, members are encouraged to take on a club-based initiative or be part of a district or global grant that improves the health, well-being, education, or economic security of girls in their communities and ensures their access to resources.

ROTARY DAY OF SERVICE

Organize a meaningful day of hands-on service activities where Rotary members and the community come together to improve your community. Share your completed projects on Rotary Showcase: rotary.org/showcase.

PRESIDENTIAL CONFERENCES

A series of presidential conferences will highlight regional humanitarian efforts led by Rotarians and Rotaractors in their communities and around the world. Invite a friend to join you at one of the events so they can learn about Rotary's work and join us in our commitment to service:

5 October 2021 — Gyeongju, Korea
26-27 November — Manila, Philippines
4-6 February 2022 — Hyderabad, India
12-13 February — Foz do Iguaçu, Brazil
4-5 March — Maputo, Mozambique
18-20 March — Venice, Italy
3-4 June — Houston, Texas, USA

Learn more on my.rotary.org.

Dates are subject to change. Check event website for most current information.

Rotary

SERVE TO CHANGE LIVES

our commitment to diversity, equity, and inclusion

Rotary

At Rotary, we understand that cultivating a diverse, equitable, and inclusive culture is essential to realizing our vision of a world where people unite and take action to create lasting change.

We value diversity and celebrate the contributions of people of all backgrounds, across age, ethnicity, race, color, disability, learning style, religion, faith, socioeconomic status, culture, marital status, languages spoken, sex, sexual orientation, and gender identity as well as differences in ideas, thoughts, values, and beliefs.

Recognizing that individuals from certain groups have historically experienced barriers to membership, participation, and leadership, we commit to advancing equity in all aspects of Rotary, including in our community partnerships, so that each person has the necessary access to resources, opportunities, networks, and support to thrive.

We believe that all people hold visible and invisible qualities that inherently make them unique, and we strive to create an inclusive culture where each person knows they are valued and belong.

In line with our value of integrity, we are committed to being honest and transparent about where we are in our DEI journey as an organization, and to continuing to learn and do better.

Download a copy of Rotary's commitment to DEI at **rotary.org/dei**.

Dear Rotary members,

In Rotary, we celebrate diversity, equity, and inclusion. It doesn't matter who you are, who you love, how you worship, whether you have a disability, or what culture or country you (or your family) are from. All that matters is that you want to take action to create lasting change.

Rotary is working to ensure that everyone sees us as a just and welcoming organization. Diversity has long been one of our core values, and we're proud of the organization we've built. But there's more we can do to exemplify diversity, equity, and inclusion (DEI); to expand our ability to reflect the communities we serve; and to respond to our communities' needs.

Based on input from our DEI Task Force, Rotary International's Board of Directors strengthened the DEI statement we adopted in 2019. The result is a heightened commitment to diversity, equity, and inclusion focused on celebrating everyone's contributions, advancing equity, and creating an inclusive culture where each person knows they are valued.

Diversity, equity, and inclusion are not political issues. Each of us has the right to be treated with dignity and respect, to have our voices be heard, and to access the same opportunities to succeed and lead at Rotary. Our members consistently tell us that being a welcoming organization is vital to our future and that by being diverse and inclusive is how we'll remain the preeminent place for people of action to connect with one another and make a difference.

We look forward to your continued support as we make Rotary more diverse, equitable, and inclusive, ensuring that everyone who engages with Rotary knows they are valued and belong.

Shekhar Mehta
RI President, 2021-22

Jennifer Jones
RI President, 2022-23

5 ways your club can support diversity, equity, and inclusion:

1. Share our updated statement about Rotary's commitment to DEI with your members via email or at a club meeting.
2. Post the updated statement to your club website and social media accounts, and link to it in your club's email signatures.
3. Use the statement to discuss how your club can be more diverse, equitable, and inclusive for current and future members.
4. Encourage your fellow members to be respectful of one another and speak up when a person's actions don't reflect our ideals and values.
5. Expand your knowledge by taking a DEI course in the Learning Center.

Find more resources at rotary.org/dei.

THE CONVERSATION

Aidan O'Leary

Our best chance to eradicate polio is now, says the World Health Organization's polio chief. Here's why

Illustration by Viktor Miller Gausa

"There's something about the whole idea of eradicating polio that grabs the imagination," says Aidan O'Leary. "Most people talk about making steps toward achievements, and it's almost always into the never-never. Eradication is a zero-sum game; anything short of zero is failure. You keep getting closer and closer, but ultimately the only number that actually matters is zero."

Although O'Leary, the polio eradication director for the World Health Organization, is speaking from his home in Galway, against the verdant backdrop of western Ireland, his focus is on war-torn Afghanistan and the parched and dusty plains of Pakistan — the last two places on the planet where wild polio still thrives.

Even during a pandemic, even as grim realities confront him, O'Leary conveys a sense of optimism about the possibility of finally eradicating polio. "Particularly in the days of COVID-19, there is something that really resonates about snuffing out a highly communicable infectious disease," he says. "As COVID has taken off, it has also led a lot of people to better understand why now is the time to finish this job with polio."

Yet O'Leary's optimism is shaded with a sense of urgency and pragmatism. "There is absolutely no case for complacency here," he says. "What is really important is that we double down on reaching the persistently missed children who are a top priority for our program."

O'Leary, who began his tenure as WHO's polio chief in January, came into the job knowing the terrain well. He formerly led UNICEF's polio eradication efforts in Pakistan and was the head of the United Nations Office for the Coordination of Humanitarian Affairs in Afghanistan, Iraq, Syria, and Yemen, organizing the UN's emergency response during crises.

O'Leary says he understands the difference Rotary can make — both in a community and in the global fight against polio. In Galway, a local tradition involves kicking the limestone wall at the end of a 2-mile stroll on the Salthill Promenade along Galway Bay (the reason for doing so has been lost in the mists of time). In 2012, O'Leary explains, the Rotary Club of Galway-Salthill installed on that wall a box that bears the slogan "Small Change, Big Impact" and encourages walkers to leave a small donation, with all money collected going to local charities and institutions.

In July, weeks before the dramatic turn of events in Afghanistan, O'Leary joined *Rotary* magazine senior staff writer Diana Schoberg and Dave King, editor of *Rotary* magazine for Rotary International in Great Britain and Ireland, on a Zoom call to discuss the new strategy of the Global Polio Eradication Initiative (GPEI) and the new polio vaccine, and how they will be used to eradicate polio — once and for all.

What is the latest update on wild poliovirus?

The numbers are extremely encouraging. We've gone over a very bumpy road during the last two years. We had a fivefold increase in cases between 2018 and 2019, when we saw 176 cases, and we had 140 cases in 2020. But we've recorded just two cases this year [as of 27 July] — one each in Afghanistan and Pakistan. [Both cases were in January.]

The particularly encouraging part right now is that the program has a very elaborate network of environmental testing sites for sewage — almost 100 sites in Afghanistan and Pakistan that cover all of the major population centers. In 2020, almost 60 percent of the monthly test samples came back positive for poliovirus. This year to date, that percentage is probably around 15 percent. We have been unable to detect any wild poliovirus in Afghanistan since 23 February, and we've seen just five isolates in Pakistan since 12 April.

Why do you think that is? Given that some polio immunization campaigns had to be suspended last year, you'd think the numbers would have gone in the other direction. Is it because so many elements of society were shut down due to the pandemic?

While conditions in 2020 were certainly adverse both for surveillance and for the campaign operations, there are two areas that are helping us this year. One is reduced mobility — both within Afghanistan and Pakistan, and across the borders. When you look particularly at the experience in India, with the explosion of COVID cases in the first and second quarters of 2021 — and what were some very shocking images of funeral pyres — I believe that the drop in mobility has had an impact. There has also been a change in social norms, very simple things like social distancing and hand washing. Maybe that has made some impact, as well. But those are short-term changes.

With the conflict in Afghanistan, we don't believe that the benefits we're seeing from reduced mobility will continue indefinitely. We need to continue to prepare for the possibility of large-scale displacements across borders. We need to grab the opportunity that we have.

Now we're coming into the high season for polio transmission, so we'll continue to wait and see. There's certainly no complacency from our program.

Vaccines are on everyone's mind because of COVID. Has that affected acceptance of the polio vaccine?

For me, the more fundamental issues in Afghanistan and Pakistan center around household and community confidence and trust. If you get the basics of that right, you are 80 to 90 percent there. The challenge has always been reaching the other 10 to 20 percent.

The key issue is broader — the marginalization of communities. That's not

something that can be addressed just at the household and community level. It requires a systemic engagement to try to make sure that we properly understand the community's actual needs and then that we connect those dots in a more reliable way.

The single most important relationship that the program has is between a frontline vaccinator and the caregiver who answers the knock at the door. That caregiver is usually the mother, and what's really important for our success is that the frontline vaccinator is a local woman who is well-trained and motivated to do what she's doing. If that relationship of confidence and trust is developed, then you're able to vaccinate all of the children inside the house.

Because of the suspension of house-to-house vaccination campaigns in 2018 in areas of Afghanistan controlled by the Taliban, more than 3 million children routinely miss vaccinations. Do you think that polio eradication is possible while the security situation in Afghanistan is so unpredicable?

We continue to speak with all parties. Our priority is the protection of children, and that requires engaging with all stakeholders. We have an agreement with the Taliban to conduct mosque-to-mosque campaigns, which we hope we'll be able to initiate in the coming months. In some cases, we'll be reaching children for the first time in several years. We'd like to build on those opportunities toward resuming house-to-house vaccination campaigns.

We don't have an all-or-nothing situation. Let's seize the opportunity to reach 40 to 50 percent coverage before we start talking about 100 percent. Will the campaigns in July and August be perfect? No. They're taking place against the backdrop of a growing full-scale conflict, so we have to make sure that we find appropriate ways of making that work.

There will be risks. Eight frontline workers were killed in eastern Afghanistan earlier this year in various targeted killings. In these contested areas, the de facto authorities on the ground shift. We need to make sure that we navigate these areas as sensitively as we possibly can.

We are also working on financing essential immunization coverage [universal access to all relevant vaccines], particularly in the provinces of the southern region of Afghanistan. We recognize that it's not just a polio gap. There's a much broader gap.

The other point that I would highlight is the importance of the surveillance system. Although we have not been able to reach all children with vaccinations, our surveillance system is continuing to pick up all the acute flaccid paralysis cases. There is a basic system in place that allows us to properly understand what's going on. We want to build incrementally and in a sustainable way to make sure that we have access in all of these areas for the purposes of our immunization programs.

What about in Pakistan, where 81 percent of the cases are among the Pashto-speaking population, who make up 15 percent of the overall population. Why are the cases so concentrated within that group, and what is the program planning to do to address it?

It's often presented as a vaccine acceptance issue, but I think it's much broader than that. Because of economic migration, among other reasons, you have this massive influx of Pashto-speaking people from across Afghanistan and Pakistan into Karachi. You're seeing this huge explosion of settlements — formal, informal, and everything in between. These settlements tend to be highly underserved. There can be issues between the state and provincial administrations and these minority communities. There's a wider issue around community acceptance, confidence, and trust.

The polio eradication program is one of the few programs that reaches these communities, but their needs go way beyond polio vaccines, including clean water and sanitation, nutrition, basic health services, and education. So when you are trying to access these informal settlements, you have this big residue of issues that polio essentially becomes the proxy for.

These issues are not strictly within the control of our program, but we recognize that to build the acceptance and trust of these communities, we're going to have to make a much more sustained effort than we perhaps may have been doing in the past. The idea on our side is to move from patchy and ad hoc initiatives to something much more comprehensive and systemic.

The new strategy talks about "zero-dose children." What does that term mean?

Zero-dose refers to any child who has never had a vaccine. We want to make sure that they not only get the oral polio vaccines but also as many other essential immunizations as is feasible. It's not just a question of a fixed, static target of high-risk children in core reservoirs — those areas with persistent wild poliovirus transmission. There is a rolling target that we have to stay on top of. We're in a race against time with newborns. There are between 7 and 8 million babies born

"THE SINGLE MOST IMPORTANT RELATIONSHIP THAT THE PROGRAM HAS IS BETWEEN A FRONTLINE VACCINATOR AND THE CAREGIVER WHO ANSWERS THE KNOCK AT THE DOOR."

HOUSE CALL
In places like Karachi, Pakistan, Aidan O'Leary says, the most successful "frontline vaccinator is a local woman who is well-trained and motivated."

Khaula Jamil/Courtesy of Rotary International

every year in Pakistan. So we need to make sure that within the first months of those babies' lives, we're reaching as large a proportion of them as we possibly can.

What's your best guesstimate of your target?
Every time we do a national immunization campaign in Pakistan, which are house-to-house campaigns, we target more than 40 million children under age 5. When we go to Afghanistan, that number is between 9 million and 10 million. It continues to be very humbling to see what frontline workers are doing during a pandemic.

We're dealing with two issues here, aren't we — wild poliovirus and the circulating vaccine-derived poliovirus. What is the difference between the two?
The wild poliovirus is essentially as its name describes. It's the original of the species. It has evolved over centuries and millennia, and it has continued to evolve.

The oral polio vaccine contains a live but weakened virus, which can circulate among under-immunized or unimmunized populations for a long period of time, usually for years. And eventually, it can revert to a form that causes paralysis. That is circulating vaccine-derived poliovirus [cVDPV].

Viruses require an immunity gap. They need susceptible children. Anywhere there are zero-dose children, you're going to find these diseases taking off. When we map where these children are, we keep coming back to the same locations again and again. That's why we really have to double down and make sure that these zero-dose children are our very top priority to get covered by vaccination.

Globally, how widespread is cVDPV?
There have been 1,800 cases since 2016. Between 2018 and 2019, there was a tripling of cases, and then there was a further tripling between 2019 and 2020. The total number of cVDPV cases in 2020 was 1,103. So far in 2021 [as of 27 July], there have been 179 cases. We've seen real progress as immunization campaigns have resumed. The number of countries with cases has decreased from 27 last year to just over a dozen.

These cases happen where children miss vaccinations. When children are fully vaccinated, cVDPV is not a problem. These cases are highly concentrated, with Afghanistan and Pakistan making up 40 percent of cases in 2020. If you look at the situation in Afghanistan, which was the country with the greatest number of cVDPV cases last year, more than 90 percent of those were concentrated in the areas that were inaccessible due to the Taliban banning house-to-house polio campaigns.

So again, the challenge for us is to protect through vaccination. You create a risk by not building up the immunity levels as high as they could or should be. As a program, we are trying to get back to a stage where we're going after the root cause of the problem — which means making sure that we are fully vaccinating all of these zero-dose children.

If there are two cases of wild poliovirus and more than 100 cases of cVDPV, which is the bigger concern?
We set ourselves two goals: The first is to eradicate the wild poliovirus, and the second is to interrupt the transmission of cVDPV. The wild poliovirus has proven to be the most elusive. We need to clear it once and for all. Afghanistan and Pakistan are the two countries where the two types co-circulate. We've seen very clearly that with the regular campaigns, we have been able to mop up cVDPVs to a pretty good extent. The wild poliovirus is a much more persistent challenge.

There is a new tool for tackling cVDPVs. How was that developed and what are you hoping to achieve?
Last November, WHO granted its first-ever emergency-use listing for a vaccine to the novel oral polio vaccine type 2

RUTHLESSLY FOCUSED
The new eradication strategy includes improving surveillance and integrating polio vaccines into health programs.

Khaula Jamil/Courtesy of Rotary International

[nOPV2]. This is a vaccine that has been under development for almost 10 years. It's as effective as the existing vaccines, but it has much greater genetic stability. That makes it less likely to regress to a form that can cause paralysis. The Strategic Advisory Group of Experts on Immunization has described it as the vaccine of choice for outbreaks [of cVDPV] moving forward. Countries that want to use the vaccine have to meet the criteria for initial use [regarding surveillance and safety monitoring]. We've seen a large number of campaigns implemented since March, with almost 50 million vaccines administered, and we've had no major adverse safety signals and no adverse signals on surveillance that would give rise to concern. We're working to see if we can move from an initial-use phase to a wider-use phase, which would reduce some of the more onerous requirements, particularly around the surveillance system.

If you were a betting man, where would you put the odds that Afghanistan and Pakistan will become totally polio-free?
I would be pretty confident.

Our new strategy has a goal of interruption of circulation of all wild and circulating vaccine-derived poliovirus by no later than 2023, and certification of the world as wild polio-free by 2026. An important point is that I find 2023 and 2026 mean nothing to people on the ground. I've spent 20 years in operations. When you talk about these three- and five-year strategies, people's eyes glaze over. We need much more tangible targets, built quarter by quarter.

What we set as a target for this particular quarter [July-September] is to open up the access dynamics in Afghanistan. We set targets, for instance, in relation to the move from initial use to wider use of nOPV2. We're seeing very substantial progress in relation to that.

And that's why, forget 2023, forget 2026 — focus on what we need to do this month, what we need to do next month, what we need to do the month after. Keep a rolling cycle of performance improvements, which is the absolute key toward making this goal.

In June, the Global Polio Eradication Initiative released a document titled "Delivering on a Promise: Polio Eradication Strategy 2022-2026." Will it do as it says?
I do think it's feasible to reach our set timelines and goals, and to deliver on

"THE ERADICATION PROGRAM IS NOT ABOUT ACHIEVEMENTS. IT'S ALL AROUND CLOSING GAPS: ACCESS GAPS, SURVEILLANCE GAPS."

what was laid out within them. We just have to be very honest about where the gaps are and what's being done to close them. The eradication program is not about achievements. It's all about closing gaps: access gaps, surveillance gaps. We just keep going, going, going, and then suddenly you realize you're there.

I'll highlight two of the situations that I've dealt with in my career. I started working on polio eradication originally in January 2015 [as chief of polio eradication in Pakistan for UNICEF], and at that time Pakistan's program was described as a disaster by the Independent Monitoring Board. In 2014, there were 359 global cases of wild poliovirus, of which 306 were in Pakistan. Two and a half years later, we were down to roughly three cases. I think we had a total of eight for the year. We worked our way through the challenges. It's important to be ruthlessly focused on finding the critical path for eradication. So that was lesson No. 1.

With this job, when I started in January, I was asked why I was taking on this program at this point in time. For me, it's never daunting and it's never impossible. The challenge is to understand where you are and then, concretely, what are the practical steps that you need to take. For me the big achievement last year was staying in the fight. People sometimes underestimate what it meant to get the program back up and running in the middle of the pandemic. There were very courageous decisions by governments and by frontline workers, as well as a whole range of other people.

A previous strategy was published in 2019. What wasn't working, and how is the new strategy bringing in new ideas?

The epidemiology was going further and further away from zero, and then came the COVID pandemic, which was a pretty fundamental game changer. There was a real concern that the program had lost its emergency orientation. There was also a recognition of the need to have a serious re-look at the broader-based community demands.

Another part is related to government ownership. It's one thing for the GPEI to have its emergency orientation. But we also need that emergency orientation to be identified by governments. One of the things that was very striking for me in Pakistan was the extent to which the National Emergency Operations Centre infrastructure was being used to support the pandemic response. There was a daily meeting on COVID with the top provincial leadership, the military, and the Ministry of Health. All of the groups were reviewing real-time data, making decisions, and then having pretty robust accountability for follow-up actions. We want to convey the message that, though the magnitude of the polio emergency is not of the same scale as the COVID pandemic, we would strongly encourage that modus operandi.

The other piece that has to be strengthened is performance and risk management. We've talked about 2023 and 2026. But what are all the milestones? When you're reviewing your performance, course corrections are fundamentally better when they're done at the moment. We need to do that in a much more structured way, with key metrics.

What thing are you most focused on? What keeps you up at night?

Seizing the opportunities that are in front of us. Keeping ruthlessly focused on persistently missed children. We have a lot of initiatives, but they aren't equally effective. What's really important is that whether it's campaigns, health camps, or routine immunizations — whatever we're doing, is it helping us to vaccinate one more persistently missed child in a core reservoir? Are we making inroads with every single campaign, with every single activity we do, that are bringing us closer and closer to our goal?

What keeps me awake at night is the risk if we're not ruthlessly focused on that. We can generate big numbers, but are we actually getting the right children vaccinated with all of our efforts?

What is your message to Rotary members?

I've been in this job now for six months. I've met with Rotarians virtually and in person across India, Africa, Pakistan, and Afghanistan. I haven't detected any kind of diminution of commitment. There's a very clear-eyed focus. The message is simple: A polio-free world is within reach. There is an opportunity, and now is the time to stay the course. ■

STRATEGIC PLAN HIGHLIGHTS

In June, the Global Polio Eradication Initiative launched a new strategic plan, "Delivering on a Promise: Polio Eradication Strategy 2022-2026," with two goals: interrupting the transmission of wild poliovirus in the two remaining endemic countries (Afghanistan and Pakistan) and stopping outbreaks of circulating vaccine-derived poliovirus (cVDPV), which arise when the live virus used in the oral polio vaccine mutates back to a virulent form as it circulates among unimmunized and under-immunized populations. Here's how we'll get there.

1 **Political advocacy:** Work with governments to generate greater urgency and accountability for timely and effective outbreak responses. Build personal relationships and increase trust with those at the national, provincial, and local levels to develop a better understanding of the benefits of the polio program. Explore options to work around the ban on house-to-house vaccinations in parts of Afghanistan.

2 **Community engagement:** Build meaningful partnerships with high-risk communities disproportionately affected by polio, such as Pashto-speaking communities in Afghanistan and Pakistan. Create committees where community members can contribute to polio campaign planning and relay other health needs. Work with Pashto-speaking influencers, such as birth attendants and women's groups, to develop a better understanding of how polio vaccinations can support their broader child care practices.

3 **Improve operations:** Strengthen campaigns by recruiting and training frontline workers who come from the local community, speak the local language, and are women. Ensure frontline workers have the supplies and security to do their jobs well and receive professional development opportunities. Adopt technical innovations such as digital mapping and mobile payments to workers. Deploy the recently approved novel oral polio vaccine type 2 (nOPV2) to fight outbreaks.

4 **Integrate polio into health programs:** Reach zero-dose children in Afghanistan and Pakistan with all vaccines. Support the COVID-19 vaccine rollout. Make polio vaccines part of a broader health and basic services package that is developed in partnership with communities. Support health facilities in providing a dose of oral polio vaccine to newborns.

5 **Improve surveillance:** To speed up outbreak responses, use technical innovations to get quicker results when testing for poliovirus in children with paralysis. Integrate polio surveillance into the surveillance systems for other vaccine-preventable diseases, such as measles and COVID-19.

Read the full report at **polioeradication.org/gpei-strategy-2022-2026.**

by Charles Fishman
Illustrations by Shonagh Rae

Five water and sanitation problems that could be lurking in your own backyard

WATER PRESSURE

Today in the United States, tens of thousands of people have no drinkable water in their homes. Some have no running water at all.

Some Americans haven't been able to drink water from their kitchen faucet for years because it's not safe. Some live in towns where the water plant has broken down, and now they can't take a shower or flush their toilets. Some must drive miles to collect clean water — making hundreds of trips a year, water sloshing in containers as they tote it home in the back of their pickup trucks.

How is this possible in 2021?

Most Americans take water for granted. We think our tap water at home should be all but free. We willingly pay 1,000 times the cost of that tap water for bottled water that we think of as "safe" (U.S. bottled water sales, per person, have almost tripled since 2000), but we don't insist that our municipal systems be maintained.

When people in the United States don't have drinkable water, there's almost always a complicated reason behind it. But usually, the problem is neither the water itself nor the engineering that's required to deliver it. The issue is the part that involves people: the politics, the money, the process of getting things fixed.

Sometimes the problem is a deep mismatch between the systems we have set up to manage water and the way it needs to be delivered in a particular place. Sometimes the problem is as simple — and corrosive — as neglect. Sometimes a town has been so hollowed out economically that it has no money for basic services, not even for water.

And sometimes the problem is caused, or perpetuated, by something even more willful: Everyone up and down the chain knows that something about their water system is fragile or broken or dangerous, but no one musters the courage to talk about it and fix it.

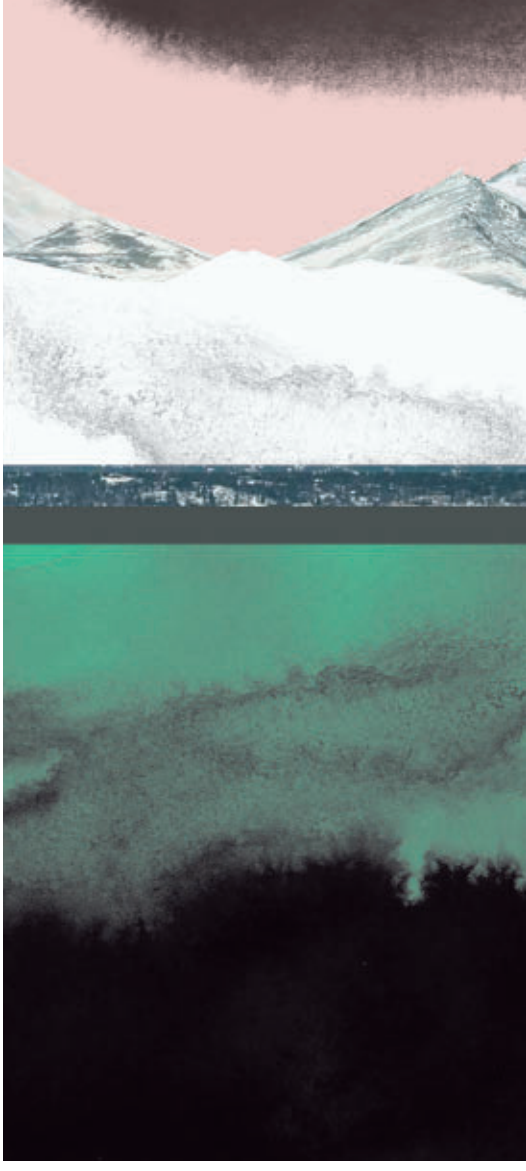
There are places in the United States — the city of Chicago, the suburbs of South Florida — where officials avert their eyes every day from nagging issues that could quickly turn into major problems for hundreds of thousands of people.

Americans have long relied on the brilliant engineering of our water systems to see us through — but much of that engineering is a century old. It's ready for a fresh burst of innovation, or at least attention.

In the following pages, we look at five places that are facing serious problems. These problems are ones that Rotary members in the United States — as well as in places such as Canada, Europe, and Australia — may have read about, seen with their own eyes, or even worked to fix in other parts of the world, often without realizing that they are also happening in their own backyard.

Charles Fishman has been reporting and writing about water since 2006 and is the author of the bestselling *The Big Thirst: The Secret Life and Turbulent Future of Water.*

The cold, hard truth about water in rural Alaska



On the afternoon of Sunday, 14 February, residents of Selawik, Alaska, were getting ready for a Valentine's Day church potluck supper. The temperature in the village, situated a short snowmobile ride above the Arctic Circle, was 2 degrees below zero, about normal for that time of year.

At around 4:30 p.m., the power went out. Selawik's power plant was offline, leaving houses and buildings in the village — the health clinic, the stores, the apartment complex — without electricity. When the backup generator at the water treatment plant failed, Selawik was no longer just dark and cold. Now the village also lacked running water and sewer service.

Selawik is one of roughly 200 small, rural, self-sufficient communities in Alaska. Some have as many as 1,000 people, but most have fewer than 300. There are no roads to these villages. You arrive by boat during the warmer months, and by snow machine or airplane in the winter.

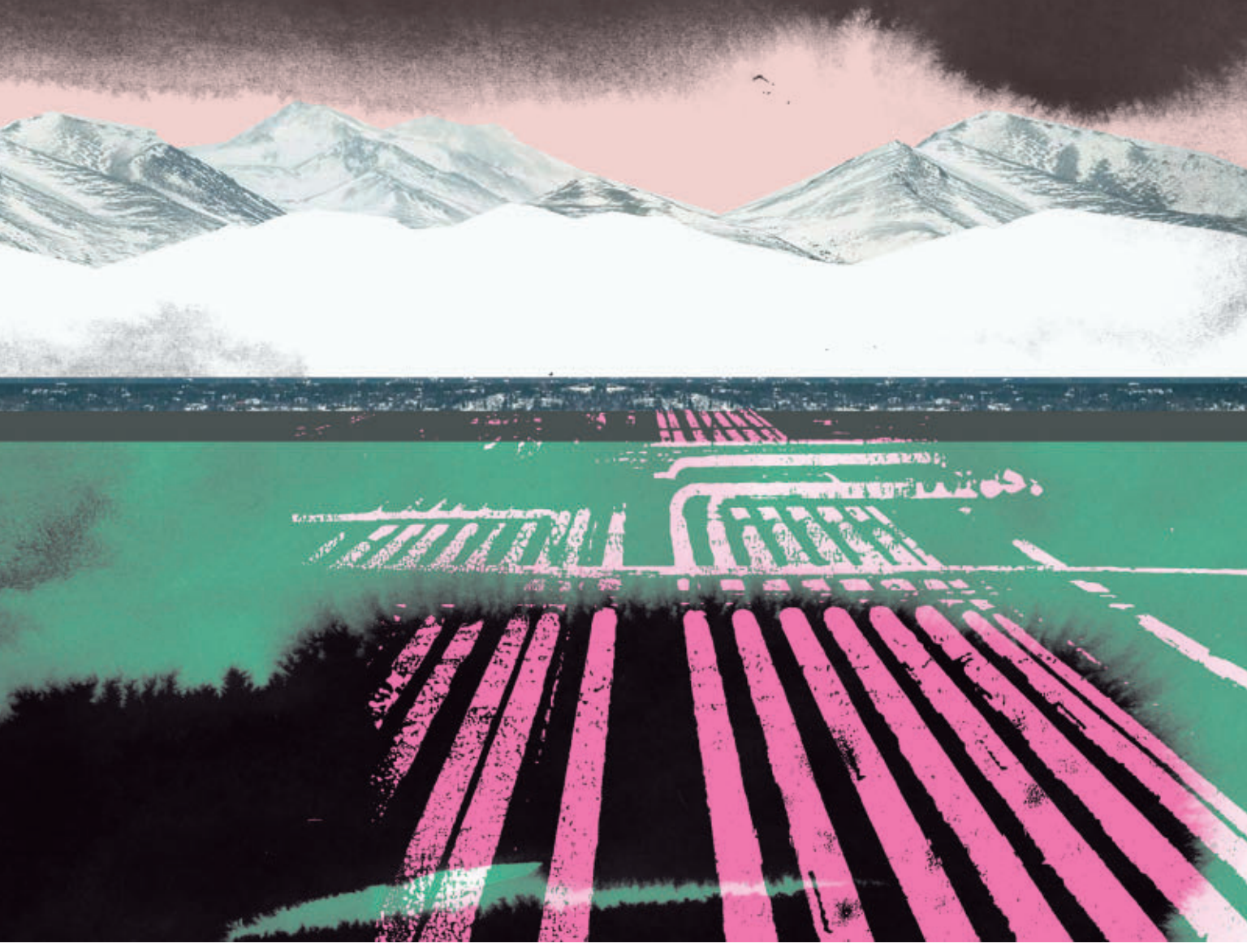
The town's electricity wasn't fully restored until four days later. The high temperature during that time span: zero. But you don't make your home and raise your children north of the Arctic Circle without having a strong measure of self-reliance. Despite the cold and dark of February in Alaska, the people of Selawik came through the blackout just fine.

Their water system did not.

Water systems in rural Alaska must be adapted for the state's extreme conditions. Selawik has its own water treatment and wastewater plants — but the pipes all sit above ground because the permafrost isn't stable enough to bury water mains in. And without the insulation that comes from burying water and sewer mains, the clean water in Selawik's 20,000-gallon storage tank has to be heated all winter; that warm water is circulated through the town's water mains, pumped out and back in a constant loop. The sewer lines run between those outbound and inbound water pipes, whose warmth helps keep the wastewater flowing. The pipes that connect each home to the main line typically have a thin electric heating element running along them — Alaskans call it a "heat trace" — to keep the pipes from freezing.

When the village lost electricity, Selawik's whole system froze.

Even after the power was restored, much of the water system couldn't be thawed out. It was simply too cold outside. So for weeks, Selawik residents hauled containers of clean water from the water plant to their homes and used five-gallon buckets lined with garbage bags to collect wash water and human



waste. Those are common enough in Alaska that they have a nickname: honey buckets. When they are full, the bags are tied up and set outside to freeze.

At the beginning of April, the village's water mains were still frozen.

"This was a huge event," says Tanya Ballot, the tribal administrator for Selawik. "It caused great havoc in our community."

But it was a quiet disaster, one typical across the state. More than 20 percent of homes in rural Alaska lack full indoor plumbing, affecting as many as 30,000 people, most of them Alaska Natives.

Of the approximately 200 rural communities across Alaska, about 70 of the smallest have either basic water service — usually a single community water center called a "washateria" that has potable water, showers, and laundry facilities — or have no shared water and sewer service at all.

With only a few hundred residents, villages struggle to sustain the technical expertise needed to maintain their water systems.

The other 130 or so villages, like Selawik, limp along with complicated, aging water systems. With only a few hundred residents, such villages struggle to sustain the technical expertise needed to maintain the water systems — and also to pay the cost of routine operations, which is always the sole responsibility of the residents.

A month before Selawik's disaster, the washateria in Tuluksak, population about 350, was destroyed in a fire. It was 45 days before Tuluksak was able to get a temporary reverse-osmosis system set up. In the meantime, residents hauled drinking water from a nearby river.

And a week before Selawik's disaster, the water plant in Nenana froze completely when a malfunctioning door stayed open all night as temperatures dropped to minus 36. Huge steel pipes and valves froze and cracked open, spraying water, which instantly turned to ice, in every direction. City workers and volunteers worked for 12 hours to patch the leaks and get the water flowing.

Three problems consistently beset Alaska's small water systems: one bureaucratic, one financial, and one technological.

The impact of climate change on the villages' water systems is going to be dramatic, damaging, and expensive.

In the United States, federal and state money for water systems is primarily used for capital expenses. The governments might fund almost all of the cost to build a new water plant or to overhaul a wastewater plant, but the community has to pay for the operating costs. Indeed, communities usually have to show that they can afford those costs before a grant is approved for a water or sewer system. That means that, in some ways, it can be easier to provide water to a city of 2 million than to a town of 400.

The economies of Alaska's small towns are a blend of traditional and modern. Selawik gets mail and supplies, including packages from Amazon, delivered by airplane most days, but its residents supply much of their own food by hunting, fishing, and trapping. There are not many ways to make money; municipal financial and tax resources are thin.

Meanwhile, the water systems in these towns are far more expensive to run than water systems elsewhere. No major U.S. city, for instance, has to pay to keep its purified drinking water warm before distributing it, a cost all the more burdensome in Alaska, where getting gasoline or diesel fuel to remote villages raises its price to $5 or $6 a gallon. (A 16-pack of bottled water can cost $50.) And the cost of the heating element that residents use to keep their water line open can run as much as $100 a month, on top of a $250 water bill.

In Alaska, as in any part of the country, anyone running a water plant must be certified. Maintaining a water and sewer system is relentless work, and few villages have the resources to hire someone to do it full time. Finding someone passionate about the water system and capable of doing the work — and also paying enough to keep them in the job — is a challenge.

Two organizations in Alaska have staff and engineers who help villages keep their water flowing. Village Safe Water, a state agency that is part of Alaska's Department of Environmental Conservation, and the Alaska Native Tribal Health Consortium, a nonprofit that helps manage health services for Alaska Natives, manage a list of pressing projects to maintain water service across the 200 towns. The needed work totals about $2 billion right now; the agencies typically have funding for no more than 10 percent of that amount per year.

And none of that takes into consideration the impact of climate change on the villages' water systems — which is going to be dramatic, damaging, and expensive.

Recently the foundation of one village's washateria started tilting perilously because the permafrost on which the building was constructed has begun to melt each summer. The retrofit includes a system to refrigerate the ground beneath the building to keep it frozen.

Across Alaska, the population density is a little more than one person per square mile. North Dakota is almost 10 times as crowded; Texas, 100 times. But the political and financial assumptions behind the water system in Selawik are the same as in San Antonio.

It is not lost on Alaskans that they have some of the most spectacular and pristine water resources in the country, yet they struggle to maintain drinkable water in their own homes.

Around the same time as Selawik's disaster, stretches of aboveground water mains froze in the village of Unalakleet, leaving more than 40 homes without water. Unalakleet's water system is more than 50 years old, says the village's mayor, Kira Eckenweiler, and has been crumbling for the last 10. The water from residents' taps often runs brown and sludgy because of buildup in the pipes.

Says Eckenweiler: "We're so tired of being afraid of our water."

20
Percentage of homes in rural Alaska without full indoor plumbing

32
Number of villages with no central water system at all

45
Days residents of one village went without water this spring after a fire at the water plant

$2 billion
Backlog of water system repairs in rural Alaska

Chicago's almost unbelievable lead pipe problem

Turn on your kitchen faucet full force. Let it run for five minutes.

You may find it difficult.

Five minutes turns out to be a long time to watch the water jet into the sink and down the drain. During that time, some 11 gallons of water will flow. (Imagine filling 11 one-gallon milk jugs and lining them up on the counter.)

If you're a resident of Chicago, that's how the city's water department recommends that you start each day — by turning on the kitchen faucet and letting the water run nonstop for five minutes. To make sure that the water doesn't poison you with lead.

The water department has that information posted right on its website. In fact, the city says that anytime no water is used in your home for more than six hours, you should turn on the tap for five minutes before drinking the water or cooking with it.

A typical family that follows the city's advice will use more than 4,000 gallons of water a year just preparing to make the day's first pot of coffee. One that flushes its plumbing again before making dinner will, over the course of a year, send nearly as much extra water down the drain as an average family uses in a month.

In Chicago, 400,000 residences — 80 percent of its single-family homes and residential buildings — are connected to the city water supply with a lead service line. That's the pipe that runs from the water main into a house or apartment building. The water department wants residents to make sure that any lead that might have leached into the water from that line is flushed from a home's plumbing system before someone brushes their teeth or boils water for a pot of pasta.

400,000
Estimated number of lead service lines in Chicago

1986
Year Chicago stopped requiring that service lines be made of lead

2,000
Children in Chicago who test positive for lead poisoning each year

$10 billion
Estimated cost of replacing all of Chicago's lead service lines

4,000
Gallons of water a Chicago family will need to use annually to flush out their pipes every morning

Lead service lines are the same kind of pipes that were at the heart of the water crisis that erupted in Flint, Michigan, in 2014. In Flint, there were 10,000 lead service lines. States are beginning to survey how many such lines they have: Louisiana estimates it has 56,000; California, 65,000; Pennsylvania, 160,000; Massachusetts, 220,000; New York, 360,000.

With 400,000 lead service lines in Chicago, the problem is so great and so astonishingly expensive to fix — the city estimates it will cost $15,000 to $26,000 to replace each one, for a total bill of perhaps $10 billion — that, stretching back more than 30 years, no serious effort has been made to tackle the problem. A key strategic planning document for the water department from 2003 does not mention lead pipes.

How did a single city come to have more lead service lines than 47 entire states?

Lead has been a material of choice for water pipes for so long — stretching back to ancient Rome — that the chemical symbol for the element, Pb, comes from the Latin *plumbum*, the origin of the word "plumbing." Lead is both malleable and durable. Some hundred-year-old lead water pipes function without much sign of deterioration.

But many cities and states started discouraging use of lead pipes for plumbing in the 1920s and 1930s, when it became clear how damaging lead contamination was, especially in young children. By the 1940s, cities across Massachusetts had stopped using them. New York City banned lead service lines in 1961; Milwaukee did the same in 1962.

Chicago, however, did not ban lead service lines. Its city building code actually required every home to be connected to the city water main using a lead pipe, installed by a licensed

plumber — a testament to the political power of the city's plumbers union. That only changed when the federal government banned all use of lead for plumbing in 1986. Chicago's water department estimates that 99 percent of the city's single-family homes and small apartment buildings built before 1986 still have lead service lines.

The danger of lead has been well understood for a hundred years. And in this city of 2.7 million people, 560,000 residents are under age 18, with 170,000 under age 5, the group most vulnerable to being poisoned by lead contamination. When lead from water or paint chips is ingested by young children, even the tiniest amount does damage to their brains and nervous systems. It affects basic cognition — reducing IQs and stunting intellectual and emotional development. The damage is permanent and irreversible.

In Flint, when the city changed the source of its raw water, the new supply was more corrosive. It actively dissolved lead from the pipes into the drinking water, spiking lead levels in the city's children.

Chicago adds anti-corrosion chemicals to its water supply to keep lead from leaching into the water. That's effective generally, but not completely. When water sits in service lines for more than a few hours — overnight, say, or during the day when everyone is at work or school — small amounts of lead can dissolve into that water from unprotected pipes, fittings, and old faucets. And in the last few years, Chicago discovered something else: Work carried out on the city's water system can dislodge lead from the old pipes, sending contaminated sediment into homes.

During the administration of Mayor Rahm Emanuel from 2011 to 2019, the water department undertook an aggressive program of updates to Chicago's aging water system, installing hundreds of miles of new water mains. But as city workers dug up the lines street by street, they didn't replace the lead service lines for each home — they just reconnected the old lead pipes to the new water mains. The city also had embarked a few years earlier on a campaign to install water meters — the vast majority of homes were unmetered — only to discover that in at least 20 percent of homes that received a meter, lead levels spiked. The water meter installations were halted in July 2019.

Chicago has made dramatic progress in reducing lead in the overall environment and in its children in the last 30 years. In the late 1990s, an astonishing 25 percent of the city's children who were tested showed elevated blood lead levels. By 2017, that rate had fallen to just 1 percent. (Also, in 2019, the "public health intervention level" of lead in children was lowered from 10 to 5 micrograms per deciliter.)

Research shows that most contamination comes not from water but from lead paint in older homes. But the dramatic crisis in Flint as well as Chicago's own experience with water main and water meter work suggest that the city's lead service lines are a hidden time bomb.

The city's current mayor, Lori Lightfoot, is the first in decades to commit to at least starting to remove the lead pipes. In September 2020, she said that project would begin in 2021, with the city replacing 650 lead service lines, most of them in low-income neighborhoods. But in May 2021 — eight months later — the work still wasn't underway. The city hadn't even determined which homes' lines would be replaced.

Even if Chicago were to replace 10,000 lead service lines annually — an extraordinary pace that would cost at least $150 million a year — the project would take 40 years. Some Chicagoans have done the work themselves: The city reported that 40 homeowners replaced their own lead service lines in 2019.

Anne Evens leads Elevate, a nonprofit that helps low-income families in Chicago retrofit their homes to make them safer and more energy efficient, including paying to replace lead service lines. Evens is also an engineer who for 10 years headed up the Chicago Department of Public Health's work to prevent childhood lead poisoning.

In the last few years, Evens says, Elevate has focused its lead-removal efforts on home-based child care providers. "Every time we can make one home-based child care provider lead-safe, we're protecting the eight kids in that home today — as well as the future kids that are going to be staying there," she says.

But she acknowledges that organizations like Elevate are just working around the edges of the lead pipe problem. "This is a problem we know how to fix," says Evens. "The question is only whether or not we have the political will to do it."

Chicago has discovered that work carried out on the city's water system can dislodge lead from the old pipes, sending contaminated sediment into homes.

The widespread contaminant that's nearly indestructible

Among the engineering challenges of the Manhattan Project was a small but critical problem. Building atomic bombs requires concentrated forms of uranium, and that enrichment process starts with a gaseous form called uranium hexafluoride, which scientists and engineers nicknamed "hex."

Hex worked well as the starting point for bombs, except for one thing: It is exceedingly corrosive. In 1942 and 1943, Manhattan Project engineers despaired of finding vessels, seals, and valves that could keep it contained.

In the labs of the DuPont chemical company, an engineer named Roy Plunkett had by accident created a little-understood chemical substance a few years earlier, in April 1938. That material — its chemical name is polytetrafluoroethylene — had as one of its chief qualities an absolute resistance to destruction against almost anything that was inflicted on it — including sulfuric acid and a soldering iron. Polytetrafluoroethylene was all but indestructible.

That made it perfect for coating the valves and seals of the uranium-handling equipment at Oak Ridge National Lab. And some years later, it was rolled out to coat the skillets of America, as Teflon.

Teflon was the first of thousands of artificially created substances that have come to be known as PFAS (per- and polyfluoroalkyl substances). They turned out to be so wildly useful that their range today is astonishing.

As the key ingredient in waterproofing and stainproofing substances like Scotchgard, PFAS have been used in hiking boots and rain jackets, tents, carpeting, and upholstered furniture. PFAS resist heat, grease, and moisture, so they're used to coat french fry containers, pizza boxes, and the paper in which countless fast-food hamburgers are wrapped. They coat the inside of millions and millions of bags of microwave popcorn. They're used in nail polish, cosmetics, and some kinds of dental floss; on the surface of steam irons; in guitar strings, windshield wiper fluid, and contact lenses; and in the manufacture of items like semiconductors.

PFAS are also a key ingredient in a firefighting foam long used at civilian airports and military bases, which was sprayed on runways to reduce the risk of fire when a plane was coming in for an emergency landing — and was used by firefighters to practice for those kinds of emergencies.

It is their very indestructibility that gives PFAS such incredible utility. In all, there are some 4,700 PFAS compounds that are similar to Teflon and Scotchgard; according to the Environmental Protection Agency, 600 of them remain in use in the United States — and they are so widespread that most Americans encounter them every day.

But PFAS were never intended to be ingested by people, and they pose a serious danger to human health — starting with babies in the womb. PFAS migrate fairly easily — from the french fry box to the fries; from the dental floss to your saliva and your blood stream; and from airports and industrial sites into the groundwater and then to your taps.

It is their very indestructibility that gives PFAS such incredible utility. But PFAS were never intended to be ingested by people.

And that's where PFAS went from wonder substances to an environmental disaster.

PFAS molecules retain their durability wherever they are found — including in the environment and in the human body. They never break down — not in water or soil, not in your stomach when eaten, not in your bloodstream or kidneys. That has earned PFAS the ominous label of "forever chemicals."

Studies have found PFAS in the blood of up to 99 percent of American adults tested. A separate analysis published in 2018 found PFAS in the blood of 100 percent of 639 children from across the nation, ages 3 to 11, who were tested. The FDA has found PFAS in meat and seafood at grocery stores as well as on fresh vegetables at farmers' markets.

Three recent studies have even found PFAS in rainfall — not just in urban areas like Chicago and Cleveland, but also in semi-wild places like Sleeping Bear Dunes National Lakeshore in northern Michigan.

Says Jennifer A. Faust, an assistant professor and research chemist at the College of Wooster, Ohio, who co-authored one of the rainfall studies, "We saw PFAS everywhere."

Most of all, PFAS have gotten into the water. At thousands of sites, in 49 of the 50 states (Hawaii is still investigating potential sites), testing has found PFAS in groundwater and surface water, in wells and lakes, in rivers and streams, and even in water that is released back into communities by municipal wastewater treatment plants.

PFAS contamination has been linked to a wide range of human health problems — increased kidney and testicular cancer; reduced ability to get pregnant; high cholesterol; damage to the immune system. PFAS pass through the placenta into developing babies and are present in the breast milk of nursing mothers. PFAS are associated with low-birth weight babies and, in very young children, with reduced glucose tolerance, impaired immune systems, and interference with the functioning of vaccines.

The EPA doesn't regulate PFAS in drinking water, groundwater, or air. But the agency has a recommended "health advisory" standard of no more than 70 parts per trillion in drinking water.

In the small western Michigan community of Belmont, the McNaughton family learned in September 2017 that their home's water might be contaminated with PFAS from waste discharged by a factory owned by the shoe company Wolverine Worldwide — maker of Hush Puppies, among other brands, which are treated with PFAS-based waterproofing.

The McNaughtons live within a 25-square-mile area where a wide plume of PFAS — emanating from the old waste-disposal area set up by Wolverine — has contaminated the groundwater.

Tests on the McNaughtons' well showed their water had 5,065 parts per trillion of PFAS. In January 2018, tests on their then 20-month-old son, Jack, showed he had 484,000 parts per trillion of PFAS in his blood. The presence of such a wildly excessive amount of poisonous PFAS in the body of their toddler son sent the McNaughtons into an understandable panic. Their son's doctor eventually figured out that several of his vaccines had been rendered ineffective.

Research toxicologist Richard Rediske is a professor at Grand Valley State University, which is located not far from the Wolverine site. An expert on PFAS, he was part of a citizens' group that worked for years to get the state to

At thousands of sites, testing has found PFAS in groundwater and surface water, in wells and lakes, in rivers and streams.

pay attention to the site.

"Part of what sets PFAS compounds apart from other toxins we encounter," says Rediske, "is that they stick to proteins in our blood, and they circulate" — but they are not excreted.

Indeed, the human body acts in some ways like a reverse filter for PFAS — if they're on your popcorn or your french fries, or in your sippy cup of water, your body grabs onto them and retains them, while letting the water and the food remnants go. Starting in his mother's womb, as she was drinking water, and continuing right through his first 20 months of life, Jack's body saved up the PFAS he consumed, with the result that his blood contained 100 times more PFAS than the family's drinking water.

The area of contamination from the Wolverine shoe factory dump is in Kent County, near the city of Grand Rapids. Kent County alone has 18 documented PFAS sites.

Over the last four years, Michigan has become one of the most determined states in tracking and regulating PFAS — without waiting for guidance from the federal government. It has even deployed drones to seek out PFAS contamination sites. Every municipal system in Michigan has tested its drinking water for PFAS; one system, in the town of Parchment, was found to have PFAS levels of about 1,600 parts per trillion. Another 61 water utilities measured over 10 parts per trillion — and are being monitored quarterly to make sure they don't spike above the EPA-recommended ceiling of 70 parts per trillion.

Michigan's environmental agency has documented PFAS contamination at 188 sites across the state — every one of which is, in fact, a site of contaminated water. Among those, 62 are landfills; 22 are locations where industrial plating, a chemical-intensive process, took place; 12 are military bases; 15 are airports (including some military); and six, ironically, are wastewater treatment plants.

Water treatment plants collect dirty water from across a community and pipe it to a single location, where they clean it and then typically release it back into the environment, usually via a stream or river. But routine wastewater treatment — good enough to transform raw sewage into almost-potable water — doesn't do anything to destroy or filter out "forever chemicals." What the process does is collect the PFAS contamination from across a whole city or county and then discharge it into a single body of water.

Landfills are similar. They collect garbage and debris from an entire community, and then rainwater that soaks into the landfills washes PFAS off food wrappers and other products and into the groundwater.

The contaminated sites on Michigan's list are connected to a who's who of industrial America — the companies include BASF, Georgia-Pacific, Dow, Chrysler, Ford, GM, Marathon Petroleum, and the pharmaceutical maker Warner-Lambert.

The EPA has been promising to start managing PFAS for years — it issued an action plan in 2009 and another in 2019 — but has in fact been painfully slow to act, despite decades of growing evidence of the wide spread of PFAS and their damaging effect on human health.

The sheer range of PFAS compounds and the wide but diffuse effects they have in the human body make them a challenge. PFAS do not have the kind of direct impact, for instance, that lead has — where exposure in a child leads directly to neurological damage. The body's response to PFAS can vary based on an individual's biochemistry.

In the early 2000s, the EPA reached an agreement with DuPont, 3M, and other companies that ended the manufacture of two of the earliest and most commonly used PFAS — PFOA (used to make Teflon, halted in 2015) and PFOS (Scotchgard, phased out starting in 2000). But DuPont almost immediately began making a substitute PFAS with the trade name "GenX" in North Carolina, where it quickly became so widespread in rivers and streams — and also was found at high

100
Percentage of 639 children tested who had PFAS in their bloodstream

2,337
Number of known PFAS contamination sites in the United States

600
Types of PFAS compounds in use in the United States

1938
Year the first PFAS chemical was discovered, by a DuPont engineer

levels in the city of Wilmington's water supply — that last October, the state sued DuPont and a successor chemical company, Chemours, to generate funds to clean up the contamination.

Seven states, including New Jersey, Michigan, New York, Maine, and New Hampshire, have imposed their own state-level standards for PFAS contamination in water. Their limits for drinking water range from 8 to 20 parts per trillion, depending on the specific PFAS and the state — but are all much lower than the EPA's advisory standard of 70 parts per trillion.

Three states — Maine, New York, and Washington — have all passed bans on food packaging that contains PFAS, but those bans won't take effect until 2022 or later.

One Harvard researcher, Philippe Grandjean, who carried out an early study showing how significantly PFAS exposure reduces the effectiveness of vaccines, says that even the new state limits may not be stringent enough to protect the youngest children. Grandjean says that children, before birth and then during their first few months, should not be exposed to PFAS at all. His suggested standard: 1 part per trillion. The estimated level of PFAS in the blood of a typical American adult is 2 parts per trillion.

The good news is that it's relatively easy to filter PFAS out of water. Three standard drinking water filtration systems — granulated carbon filters, ion exchange filters, and reverse osmosis — all remove PFAS. The cleanup around the old Wolverine dump site in western Michigan will include pulling in groundwater, filtering it, then releasing it back into the environment. Rediske says that this process is effective — but, the toxicologist notes, so much water is contaminated that "they are going to be pumping and filtering for a long time. Hundreds of years."

The bad news is how astonishingly widespread PFAS are turning out to be, and not in small amounts. While states impose drinking water standards in the range of 20 parts per trillion, the rainfall sampled in two recent studies showed PFAS contamination ranging from 50 to 1,000 parts per trillion falling across the Midwest and the Great Lakes.

Says Marta Venier, an environmental chemist at Indiana University who worked on one of the studies: "You can actually say it's raining PFAS at this point."

The usable but not drinkable water in West Virginia

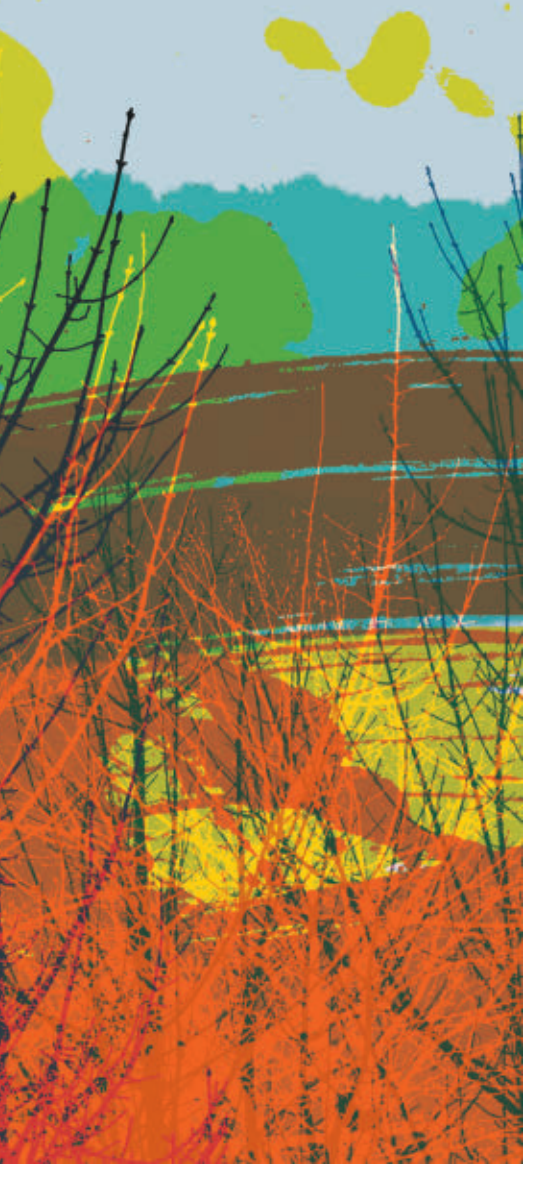
Sometime in 2007, someone knocked on Sandra and Roy Roberts' door to ask if they wanted water service to their house — a pipe, bringing purified drinking water, that would connect to their existing plumbing.

Absolutely, said Sandra Roberts.

So in 2018, when a nearby town held a meeting about bringing high-speed broadband internet to the area's residents, Sandra was the first to speak.

"Eleven years ago, someone knocked on my door and promised me I could get city water. I still don't have any city water, and I've never heard from them since — not once," she said. "Will you be like that? When is the next time we're going to see you all out this way?"

Three years later, broadband internet still hasn't arrived. And neither has water service.



In 2021, here's how Sandra and Roy Roberts get their drinking water: Every day or two, they drive a couple of miles up the road to a spot where a spring comes tumbling down the mountain. Someone long ago connected a hose to the spring. The Robertses fill up containers with 40 gallons of that mountain water — 330 pounds — and haul them back to their house. That's the water they'll use to cook, to make coffee, to brush their teeth.

Imagine that: 150 to 200 times a year, the Robertses fetch their own drinking water. The couple has been doing this since mountaintop mining began above their home and polluted their well, a couple of years after they married in 1985. They've spent almost 35 years without safe running water at home. They've raised two boys to adulthood; neither was ever able to drink a glass of water from the kitchen faucet or the bathroom tap.

So who's responsible? Who should be trying to get water to Sandra and Roy Roberts?

"We've been trying to figure that out for years," she says.

The Robertses live in McDowell County, West Virginia, a place where many people struggle every day to get clean water. One town in the county, Keystone, has had a boil-water order in place for nine years — since 2012, long enough for a Keystone third grader to graduate from high school. No one who receives water from Keystone's water system is supposed to use it without boiling it for at least a minute.

It is surely one of the longest-standing boil-water orders anywhere in the United States that has a functioning water utility. But another community in McDowell County, a 20-minute drive away on winding mountain roads, had an even longer one: O'Toole's boil-water order was in place from May 2002 to August 2019 — 17 years.

As many as one-third of McDowell County residents don't receive water service from a water utility. Many of those people — like the Robertses — have a well on their property, one that produces water that is good enough for flushing toilets and perhaps taking a shower, but that isn't safe to drink. In McDowell County, they call water that is suspect — tainted, muddy, or untreated — "usable but not drinkable."

Usable but not drinkable.

McDowell County is a rugged, beautiful stretch of mountainous, forested land in the southernmost part of West Virginia, deep in Appalachia. Its 17,600 residents are spread across 533 square miles, an area larger than the city of Los Angeles. McDowell has a few towns: Welch, the county seat, has about 1,600 people; Gary has 800; War has 700.

Fifty years ago, the county's water systems were in better shape than they are now.

McDowell County's population peaked in 1950 at 99,000 people. In those days, the county produced more coal than any other in the United States. In fact, it produced more coal than any other U.S. county every year from the early 1900s through the mid-1970s. The coal mining companies and U.S. Steel built big facilities, and they also built, maintained, and ran water systems across the county, for their own operations and for the towns where their employees lived. They kept certified water plant operators on staff.

Coal is still mined in the county, but only about a 10th of the amount that was mined in the 1940s and 1950s. McDowell County's population has fallen by 82 percent, and its economy has fallen further than that. As the coal and steel companies have pulled out, they've abandoned their infrastructure and taken their jobs and their tax dollars with them. Today, 38 percent of the county's residents receive food stamps, three times the national average. Among U.S. states, West Virginia ranks second-to-last in household income, and in 2019 its poverty rate was 16 percent. The same year, McDowell County's rate was more than double that, at 33.2 percent.

In fact, the county's water problem isn't really a water problem. Plenty of areas in the United States have terrain as rugged as McDowell County's, and plenty of areas have homes spaced as far apart. And those areas have water. McDowell County's water problem is actually an economic problem.

Tiny Keystone's water system was built 100 years ago by the coal companies, and it relies in part on fragile terra-cotta water pipes. There are no reliable records of the system; city officials don't even know the locations of the water mains.

During its boom years in the 1940s and 1950s, Keystone had more than 3,000 residents and a dozen or more businesses. Now its population is about 200. In the 1990s, it had tax and fee revenue of at least $1 million per year. Today, the city collects $8,000 per year.

Sandra and Roy Roberts have spent almost 35 years without safe running water at home.

What has collapsed in Keystone — and in half a dozen other places across McDowell County — is something much larger than the water system.

It closed down its police department; many city staff take no pay.

In 2012, Keystone lost its certified water plant operator. That's when the boil order went into effect because, in the United States, a municipality can't provide safe drinking water from a utility plant that does not have a licensed operator — someone trained to add the right amount of chlorine and do the required water safety testing. A state inspection in 2010 concluded that the plant, even then, was past its useful life, and that the filters no longer had the ability to clean the water.

Currently, Keystone's water system serves 80 customers — homes and businesses — delivering water for cleaning, flushing toilets, and bathing, but not for drinking.

Many of those 80 customers pay their water bill only occasionally, or never. With no water meters, Keystone can't cut off customers who don't pay. The city's maintenance worker keeps the water plant running, among his other duties. But when a water main break occurred in 2019, the city couldn't afford to rent a backhoe to fix it. Residents went without any water at all for several weeks.

Keystone owes Appalachian Power, its electricity supplier, tens of thousands of dollars dating back at least to 2012. It simply doesn't have the money to pay. The utility has agreed to continue to supply electricity because it knows the city needs to power street lights, traffic signals, and water pumps.

What has collapsed in Keystone — and in half a dozen other places across McDowell County — is something much larger than the water system. What has collapsed is the city's economy, along with the local government it supported, and the civil society that relies on both the economy and the government.

The folks in Keystone know all of that. The town council has voted to turn over its small, decrepit water system to the county's central water utility, the McDowell County Public Service District (PSD), which was created in 1990 to fill the gap left by the disappearing coal and industrial companies. At its creation, the PSD had 552 customers and six employees. Thirty-one years later, it has 3,228 customers and 20 employees, including managing director Mavis Brewster, who has been running the utility since 2003.

Brewster and the PSD have been working on solving Keystone's water problem for years. There isn't really a water system to take over, so the PSD is laying all new water mains. To ensure there were no interest payments for the county's water customers, Brewster opted for grants over loans, funding that took years to secure.

Construction has now begun on the $6.6 million project to connect Keystone's 80 homes to the PSD, along with homes in Northfork, Algoma, Upland, Kyle, and Powhatan. Water is expected to flow in December 2021. Keystone's boil-water order will be almost 10 years old by then.

Meanwhile, the town has had enough of trying to do something with nothing. It decided to turn out the lights permanently — at least metaphorically. In February 2018, the Keystone city council voted to unincorporate itself — to dissolve as a municipality.

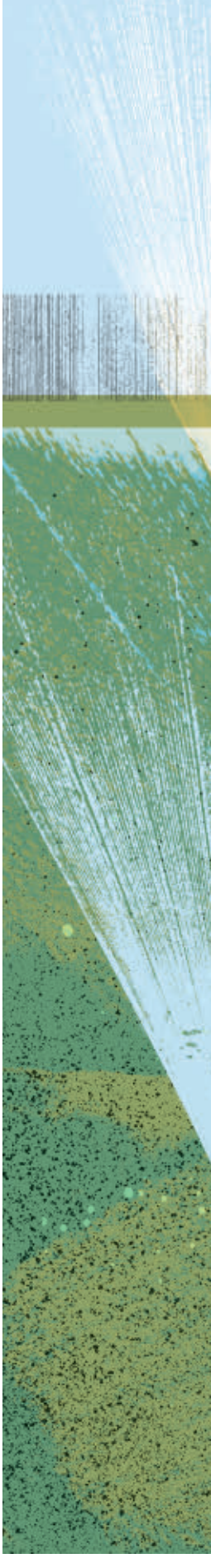
But Keystone is so poor it can't even vote itself out of existence. West Virginia cities aren't allowed to dissolve until they settle their outstanding debts. Keystone is being kept on life support in order to pay off an electric bill of $30,000 — the bulk of which comes from the cost of running a failing water system.

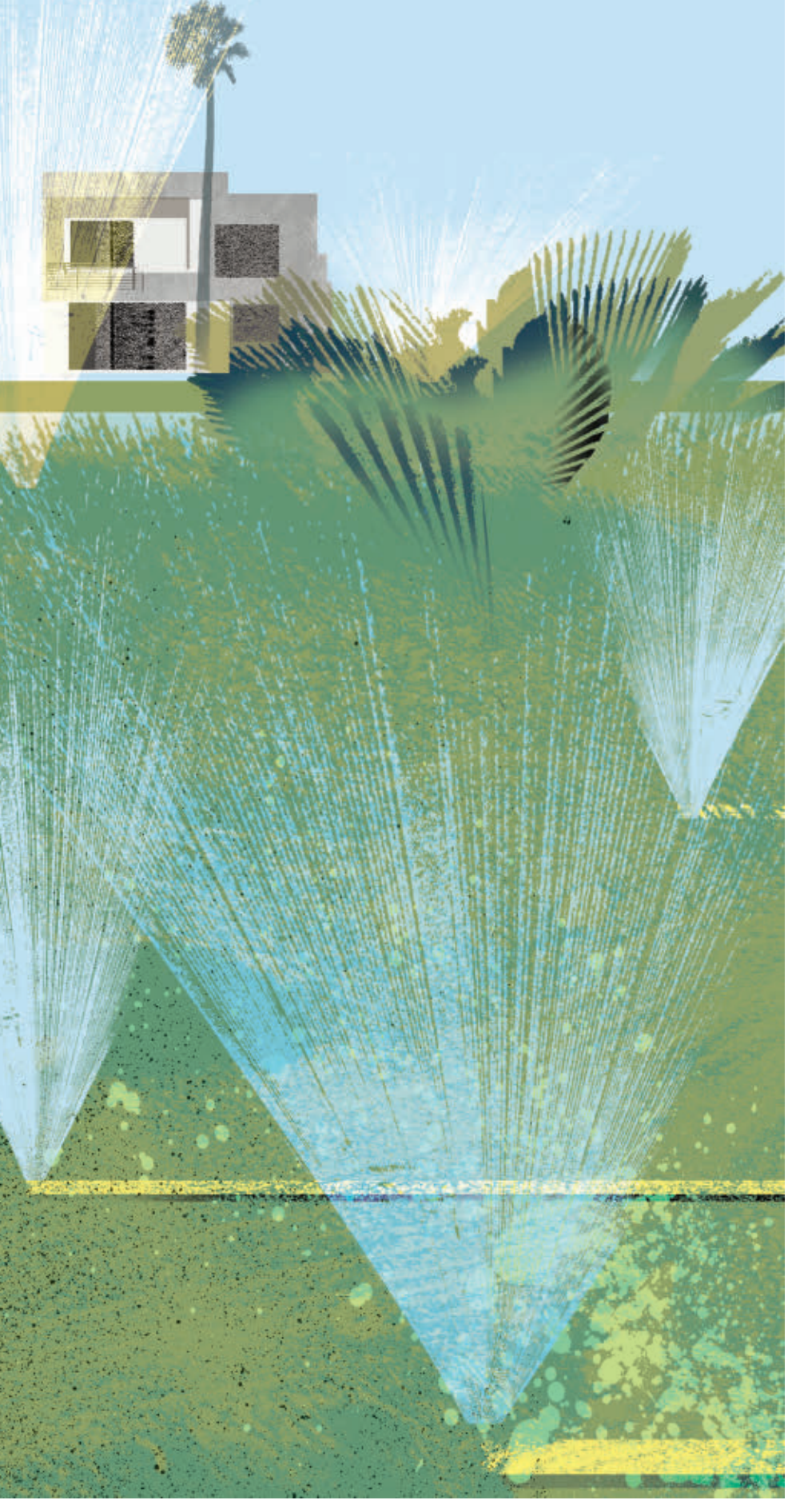
33.2%
Poverty rate in McDowell County, West Virginia

9 years
Length of time that the current boil-water order has been in place in the town of Keystone

80
Number of customers served by Keystone's water utility

$8,000
Keystone's annual tax revenue





The threat lurking beneath Miami's lawns

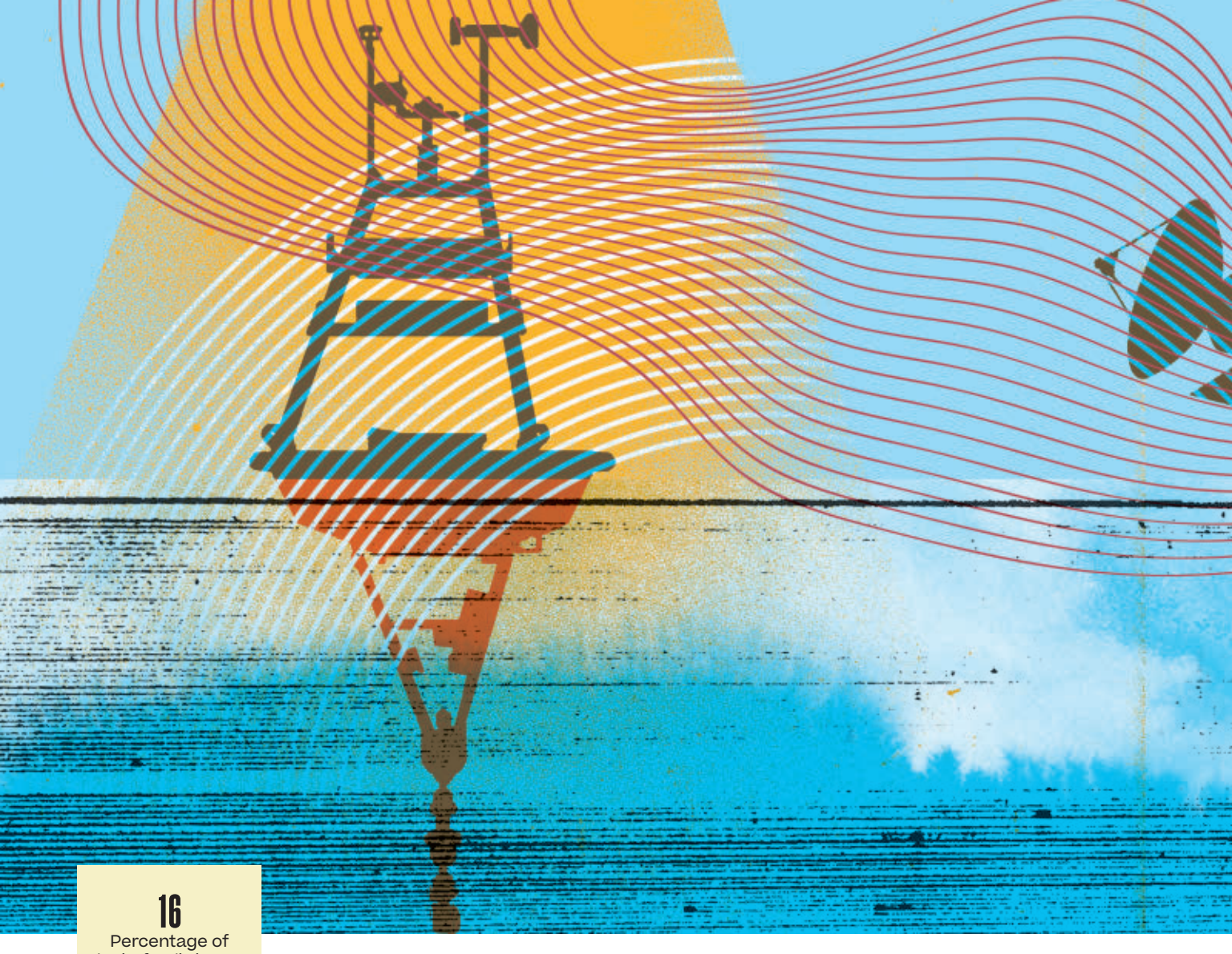
On its best days, South Florida's Biscayne Bay is an inviting expanse of turquoise water between Miami and the barrier islands and keys to its east: Miami Beach, Key Biscayne, Key Largo. The bay is dotted with sailboats and fishing boats; huge cruise ships come and go; leaping dolphins break the surface.

Biscayne Bay both captures and helps create the personality of South Florida.

But the water in the shallow bay — which stretches 35 miles from north to south but averages less than 6 feet deep — is becoming so polluted that Biscayne Bay is teetering on the edge of death. Not some kind of metaphorical death. Actual environmental death.

A network of research buoys monitors the water quality in the bay as well as in a canal and a river that feed it. Every 15 minutes, Florida International University's Institute of Environment uploads data from the buoys that then is beamed, among other places, to the mobile phone of Todd Crowl, the institute's director. If the buoys detect that the water quality has gotten dangerously bad, an alarm sounds on Crowl's phone.

"We're very close to a tipping point," says Crowl. "If we lose all the seagrass along the bottom of the bay, if everything just turns to algae, it will be too late. The bay will be dead."



16
Percentage of single-family homes built in the U.S. today that have septic tanks

120,000
Number of septic tanks in Miami-Dade County

4+
Number of inches the sea level has risen along Miami-Dade's coast since 1994

56
Percentage of septic tanks in Miami-Dade County that are "periodically compromised"

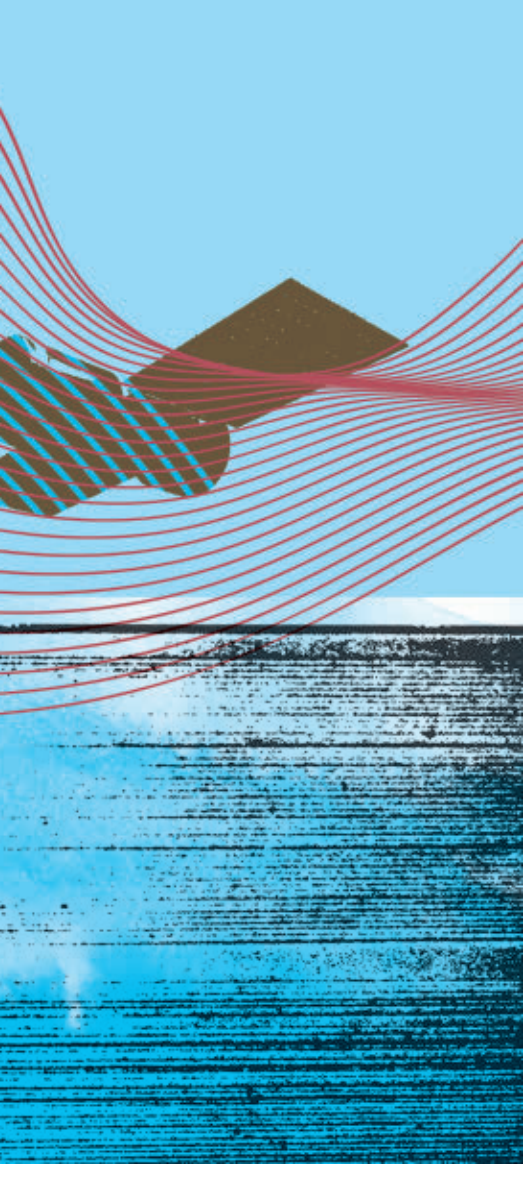
Some of Biscayne Bay's most damaging enemies lie buried in backyards across Miami-Dade County: 120,000 septic tanks that collect every toilet flush and shower runoff, and, in thousands of cases, let that wastewater seep unfiltered into the bay.

During South Florida's summer storms — monsoon-like downbursts that come almost daily — the effluent from the county's low-lying suburbs pulses into Biscayne Bay. Over a week in August 2020, thousands of fish, eels, rays, and lobsters suffocated and were washed ashore along miles of coastline.

The fish kill was so bad, and the level of dissolved oxygen in some pockets of the bay was so low, that the county's fire department dispatched two fireboats to the hardest-hit areas. The boats twirled in place, pumping thousands of gallons per minute of bay water into the air, fountain-style, in an effort to aerate those sections and save some sea creatures. Scientists from Miami's Frost Science Museum also brought aquarium-style air pumps to spots along the shore where dozens of gasping stingrays had gathered in the shallows. In an effort that went on for three days, museum staff strung perforated clear plastic hose into the water to add oxygen.

"The idea that we're trying to fix these problems by doing something like dropping an air-stone into a home aquarium — that's kind of ridiculous," says Crowl.

When they are used in the right place, the marvelous simplicity of septic tanks makes them an exemplary form of wastewater treatment. A classic septic tank is an oblong concrete box, roughly 4 feet wide, 8 feet long, and 6 feet high, that holds between 1,000 and 2,000 gallons. It is buried in the yard, and all of the home's wastewater — from



the kitchen and bathroom sinks, the showers, the toilets, and the washing machine — drains into the tank through a single pipe.

Solids settle to the bottom, and grease floats on the top. Microbes in the wastewater gradually break down much of any harmful material, and the partially treated water drains from the tank into what is called a "drain field," a carefully prepared piece of yard that absorbs the wastewater, which then slowly percolates down through the soil and eventually back into the water table. Presuming the drain field itself isn't saturated, microbes and oxygen in the soil continue to filter the wastewater.

A well-designed and properly installed septic tank and drain field is passive, hidden, and just as effective as a giant municipal wastewater treatment plant. When you flush the toilet and 1.8 gallons of dirty water enter the tank, 1.8 gallons of partially treated water leave the tank and enter the drain field.

Two things are critical: First, the solids at the bottom of the tank and the grease that accumulates at the top need to be pumped out periodically. And second, the tank and the drain field must be located well above the groundwater level. If the drain field is saturated, it can't do its part to detoxify the partially treated wastewater that comes out of the tank.

Septic tanks are perfect for widely spaced homes and for rural areas, where laying miles of sewer pipe to reach each individual house is impractical and expensive. And while they might sound rustic, septic tanks are hardly out of fashion — roughly 16 percent of all single-family homes built in the United States today have one.

In Miami-Dade County in the 1950s, 1960s, and 1970s, septic tanks were as much a real-estate development tool as an effective means of sewage treatment. In Miami's booming suburbs — where for 30 years, more than 700 people moved into the county every week — it was much cheaper and quicker to install septic tanks for each home than to lay a network of sewer pipes and build wastewater treatment plants to service them.

Across miles and miles of subdivisions — even in places where the homes sit right next to each other, three to an acre — in many South Florida neighborhoods, every house has a septic tank.

That probably wasn't a smart idea even in 1955 or 1965. Planners, scientists, and government officials knew that South Florida's ground was thoroughly porous — made primarily of limestone — and that in the rainy season, the groundwater often crested just a few feet below ground.

In the last 50 years, two things have made those septic tanks much more dangerous. Many of them have started to deteriorate or have been poorly maintained, or both. And the sea level along Miami-Dade's coast has risen more than 4 inches just since 1994; across huge swaths of the county, groundwater levels have risen so much that there is no way to bury a septic tank 8 feet deep and keep it dry.

But at least 120,000 septic tanks are already in that ground, with their drain fields alongside them, many either permanently saturated by groundwater or flooded for several months a year. They aren't merely ineffective as septic tanks for the homes they're attached to. They are a slow and steady source of the nutrients and toxins that seep into the groundwater and the bay.

The county's septic tanks aren't really like a time bomb — they won't do their damage all at once, in a single explosive event. They're more like radiation, doing steady, deadly damage that adds up over many years.

This problem is well understood across South Florida. In 2018, Miami-Dade County issued a report about its septic tanks and how the sea-level rise is impacting them. Photos taken on a sunny day showed beautifully manicured Miami lawns awash from a "king tide flooding" event — that's when seasonally high tides inundate homes that were once high and dry. The point of the pictures is: If the yards are flooded, so are the septic tanks. And if those yards can be flooded when it's sunny, imagine how bad things could get during a big storm.

Already, the report says, 56 percent of the septic tanks in Miami-Dade County are "periodically compromised" — swamped — during wet years or by heavy storms. That's tens of thousands of septic tanks that are seeping sewage.

How dire is the resulting pollution? During one king tide event in 2016, researchers measured fecal enterococci levels in some flooded residential areas. The quantity of human waste bacteria in one area was between 100 and 1,000 times the levels specified as safe by the

A well-designed and properly installed septic tank and drain field is passive, hidden, and just as effective as a municipal wastewater treatment plant.

The impact from climate change in South Florida means that the harm that septic tanks cause will increase every year.

Environmental Protection Agency.

The following year, the Miami-Dade Grand Jury — which both issues indictments for major crimes and studies major issues facing the county — devoted part of its session to the deteriorating Biscayne Bay. Its report called the bay "the crown jewel of our environment" and concluded that "without corrective action, the declining quality of this body of water may become irreversible."

The grand jury report devoted an unsparing section to septic tanks. The county, it said, should have no septic tanks at all where sewer service is now available, and should not allow septic tanks where the water table is already so high that the tanks would be routinely swamped.

In June 2020, a county task force issued a much more detailed report on how to rescue the bay, which it called Miami's "most vital quality-of-life asset and the mainstay of our economy."

"Biscayne Bay is in trouble," the task force members wrote. "The problems facing [it] are serious and complex." Among the task force's most direct recommendations: Immediately connect 12,000 homes to the county's sewer system.

As Miami-Dade County has grown in the last 30 years, it has added sewer lines; in fact, some of them have been added in neighborhoods where there were already septic tanks. But neither the county nor those homeowners have connected the older houses to the sewer system, for the simple reason that doing so would require ripping up roads and yards — and cost an enormous amount of money.

In its 2018 report, the county estimated the average cost of connecting a single home at $40,000 — including laying sewer lines and connecting piping, repaving roads, and increasing sewage treatment capacity. That puts the total cost to connect 12,000 homes at about half a billion dollars.

There are other critical sources of pollution to the bay. Miami-Dade's sewer system also is old and under-maintained and leaks raw sewage into the water table. And rainfall washes nutrients and pollutants — such as fertilizer and pet waste — straight into the canals and rivers that empty into the bay. (The grand jury report said that the county's dogs alone deposit 100,000 pounds of poop onto area lawns every day.)

The county is so worried about the state of the bay that this spring it took the unprecedented step of banning the use of fertilizer on lawns for the entire rainy season — from 15 May through 31 October.

And as damaging as the septic tanks already are, the impact from climate change in South Florida means that the harm they cause will increase every year.

The key, county officials and scientists say, is not to imagine some future in which Miami-Dade County finds the money to replace tens of thousands of septic tanks. "You don't go in and tell elected officials you need $4 billion," says Lee Hefty, who heads the county's division of environmental resources management. "We need to focus on the areas where we can have serious water quality impacts."

Crowl says that scientists and graduate students at FIU are developing "molecular fingerprinting" techniques that would allow them to test sewage that flows into the bay and trace it back to specific neighborhoods in order to determine where septic tanks are leaking most seriously.

"We're not going to have $500 million all at once," says Crowl. "We might get $10 million. So how do you spend that $10 million? The chemical fingerprinting can make sure you're replacing septic tanks in areas that give you the biggest bang for the buck."

Another thing the county could do is impose its own septic tank registration and inspection rules. It currently exerts no authority over its septic tanks, which are regulated at the state level. The county doesn't even have a complete record of which homes have septic tanks, let alone whether those tanks are functioning, impaired, or failing.

"What worries me most is the many septic systems that have failed that no one even knows about," says Carlos Hernandez, chief of water and wastewater in Miami-Dade's department of environmental resources management. "If the septic tanks we have were functioning well, we'd still

have a problem, but the magnitude would be different."

The septic tank issue is personal for many of those involved. Crowl has a septic tank, as do two of the most senior scientists at FIU's Institute of Environment. Hefty and Hernandez also have septic tanks.

Hernandez is meticulous about having his tank inspected every three years and pumped out if necessary. Two inspections ago, the technician told him the tank had filled with dirt and rock — an indication of a serious problem.

"I started digging a hole," Hernandez says, "and I found that the pipe between the tank and the drain field had collapsed. The water was flowing right from the tank into the ground. I didn't know it. My own septic tank was sending that partially treated water straight into the groundwater." From inside his house, there was no sign of a problem — and there never would have been, not in a year or a decade.

Hernandez fixed the problem right away — but what's the state of the thousands, or tens of thousands, of septic tanks that no one ever inspects?

The original ecology of Biscayne Bay was an estuary with crystal clear water, its bottom a seagrass meadow that was clearly visible from the surface — thousands of acres of seagrass beds relying on the sunlight shining through the water, with the seagrass itself helping to keep the bay clean.

Now a century of intense development near its shores is turning the bay into a turbid body whose murky, nutrient-laden water blocks the sunlight that seagrass needs to survive, one that is in danger of becoming dominated by algae.

Biscayne Bay is speaking clearly, Hefty says. "The bay is telling us: What you're doing isn't working." ■

Tap into solutions

Only a few Rotary Foundation global grants have addressed water and sanitation issues in the United States. In Arizona, one funded repairs for a local water system after a fire; in Kentucky, one helped provide equitable access to safe water and sanitation. In the Navajo Nation, global grants are being used to install cisterns in remote communities (you can read more about that ongoing project in an upcoming issue).

But grant projects aren't the only way Rotary members can help solve problems. All along the Mississippi River, for example, Rotary clubs are connecting with municipal governments to work on local infrastructure projects as part of a program that could provide a template for clubs that are located in major river basins around the world.

As active members of your community, you can learn about the water and sanitation issues that affect your region and take action through advocacy, creating awareness, and innovative problem-solving.

- Invite experts from universities, government agencies, and other nonprofits to talk to your club
- Connect with local government officials to discuss the most effective role Rotary members can play in solving issues
- Contact your state and federal representatives to urge them to support relevant legislation
- Get involved in citizen science initiatives, such as water quality monitoring
- Meet with your local or regional water resource council
- Take a tour of your local wastewater treatment facility
- Work with local Rotaract and Interact clubs to plan community projects

Learn more about Rotary's water, sanitation, and hygiene area of focus at **rotary.org/water,** and connect with experts through the Water, Sanitation, and Hygiene Rotary Action Group at **wash-rag.org.**

OUR CLUBS

VIRTUAL VISIT

Making space for nomads

Rotary Club of Gold Coast Passport, Australia

Gig work, experts say, is here to stay, and many people — freelancers, consultants, start-up mavens — are turning to co-working spaces. The best of these flexible office spaces foster an environment where professionals can share their ideas, brainstorm new ones, and network. The Rotary Club of Gold Coast Passport does all of those things when it meets at Karma Collab Hub, one of the most magically situated co-working spaces on Australia's Gold Coast.

"It's our recruitment ground," says Candice Olivier, a past club president and the co-owner of the meeting location. With a distillery next door and the Coral Sea a block away — surfboard optional — the club says that "a new wave of volunteering has come ashore" for young professionals.

Olivier was at a networking session for young professionals in 2019 when she met Andy Rajapakse, at that time the governor-nominee of District 9640; the things he told her began to dispel her notion of Rotary as something "for retirees." Rajapakse has led the charge to attract younger members to the district; he added 12 clubs — seven Rotary, three Rotaract, an Interact, and one for Rotary Youth Exchange alumni — in 2020-21, during his year as governor.

Olivier and Rajapakse "had a big conversation around volunteering," Olivier says. "I expressed my pain point as a young volunteer": rigid club requirements and continuing commitments. "I told him I wasn't joining a once-a-week club." Rajapakse countered by suggesting she start a club for young professionals and telling her about passport clubs, a flexible alternative to traditional clubs.

Kasia Brzezicka, the current club president, became a charter member about a year after relocating from Sydney. Brzezicka had investigated Rotary by attending a club that meets for breakfast, but had also demurred because of the weekly obligation. "When the passport club organizers came to me and said, 'We don't meet every week and it's going to be full of young people who want to make change in the world,' I was like, 'Yup, I'm in.'"

The club, which meets on the last Tuesday evening of each month, "was positioned to attract this demographic on their terms," Rajapakse says. "None of these members would have looked at Rotary if not for this model."

Rajapakse directed $2,500 in district public image funds to place an advertorial for the club in the inflight magazine of Jetstar Airways, a budget carrier that caters to a younger set. "It definitely got us traction," says Olivier. "We got a lot of feedback."

While winning over people who had little awareness of Rotary, the club has also attracted some who have deeper roots. Guy Murphy, a Rotary Youth Exchange alum whose father was a Rotarian, says: "I thought I was too young and irrelevant to join Rotary. I wouldn't be able to connect with anybody on my level demographically" — until he learned two friends had joined the Gold Coast club. "I felt it was a chance to give back to Rotary what it had given to me."

From the outset, the club shed a few Australian Rotary standbys. "We were adamant about not falling into the traditional trap," says Olivier. "Singing the national anthem before every meeting, having to attend a weekly meeting, and feeling bound by needing to attend." Another nonstarter, she adds, was a familiar fundraising event Down Under, a sausage cookout known as a "sizzle." Instead, the club holds social gatherings and organizes fun runs and similar events.

Passport to service

- **5 June 2019** Charter date of the Rotary Club of Gold Coast Passport
- **20 March 2015** Charter date of the Rotary Club of Greater Sacramento Passport One, the first passport club
- **32** Current members in the Gold Coast Passport club, of whom more than half are women; also, both of the club's presidents have been women
- **$30** Monthly dues (approximately US$22)

Passport clubs offer members a flexible and affordable alternative to a traditional club. Most have fewer in-person meetings and a more individualized approach to service. Find guides to passport clubs and other flexible club and membership types at **rotary.org/flexibility.**

Richard Gosling Photography

"A lot of millennials want to volunteer and want an easy way to volunteer. That's what we're providing them," says Brzezicka. She cites members' embrace of Baby Give Back, a nonprofit that provides needed items to families with infants and young children, as illustrative of the club's capabilities. Club members help out in one of the organization's warehouses on a weekly basis, unpacking trucks and sorting donated goods. "We all know each other now, so it's not just volunteering, it's a social get-together."

The dynamic approach to volunteering allows the members to tailor their own experiences. "It's not like everyone has to do everything," says Brzezicka, who stresses that club leadership roles, always time-consuming when done properly, count toward the club's recommended, but unenforced, minimum 30 hours of annual service. Projects focus on areas that include the environment, homelessness, and youth.

The dynamic approach to volunteering allows members to tailor their own experiences.

Taking the passport concept to heart, the club partners with traditional clubs in the area, with members sharing their energy and technological expertise. They rebooted a Facebook marketing campaign for a nearby club and helped it host networking events to recruit members. Jessica Hall, a marketing specialist, sees the mutual benefit for clubs with different age demographics that work together. "It can work in harmony," she says, "with older generations teaching," as well as the other way around. "It's a question of how you teach us and keep us engaged."

The club's casual meetings feature wine, cheese, and other nibbles. Recently, some 20 pajama-clad members gathered for a meeting themed around a children's clothing drive. Members might also find themselves taking part in challenges, such as one that required participants to drink from a straw for a week to raise awareness and funds for a research team that is developing a therapy to treat spinal cord injuries. (For the record, the club has a zero plastic-waste policy.)

Meetings devote 15 minutes or so to speakers from community groups, and a member spotlight allows members to discuss their own work — professional and otherwise. During the pajama session, Adrian Nathaniel, a financial adviser, discussed ethical investing.

The club's focus on professional achievement and on allowing members to set their own volunteering course has driven member satisfaction, but the club doesn't take retention for granted. "We have a strong process for nurturing our members," Olivier notes. Each member gets a call every month to discuss their well-being and how they are currently feeling in the club.

The club is dedicated to the same thing that led Paul Harris to start the first Rotary club, Olivier notes: Networking. "We are aware of that history." —BRAD WEBBER

From left: Club members Kasia Brzezicka, Guy Murphy, Marlie van Doorn, Christian Hammerle, and Helen Beel at Burleigh Heads Beach on Australia's Gold Coast.

HANDBOOK

Pair up and prosper

Mentors nurture careers and recharge their institutions

For many organizations, mentorships are an afterthought — pairings of veteran colleagues with new hires for casual chats over coffee that, predictably, yield scant results. Not long ago, mentorship was about "building more of a friendship than a relationship with goals resulting in new skills," says Wendy Axelrod, an executive coach and member of the Rotary Club of Blue Bell, Pennsylvania.

One common mistake is thinking of professional mentorships as similar to a surrogate parenting relationship. "Unlike mentoring for youth, which is often driven by the mentor, an adult mentorship needs to be driven by the learner, the mentee," says Lisa Fain, CEO of the Center for Mentoring Excellence. "Someone new to their career wants to set a vision. What are the possibilities in my field, or in my work with Rotary? How do I become a person of influence in my community?"

When mentorships work, both partners reap the rewards. "The data shows over and over that the mentor gets as much out of it as their mentee," says Fain. "They become better leaders, they become better professionals. And they get the satisfaction of hooking their wagon to a rising star."

— BRAD WEBBER

FOR CLUBS CREATING MENTORSHIPS

DO

Do survey participants beforehand. "It is good to have a questionnaire that asks what people are looking for in a mentor," says RI Director Elizabeth Usovicz of the Rotary Club of Kansas City-Plaza, Missouri. "What kind of career accomplishments do you think you can learn from? Is this someone whose behavior you admire?"

Do demand effort. "There has to be a real motivation to have a mentoring relationship," says Usovicz. "Look for someone who has talent or who seems to have plateaued a bit but has the potential to really move forward in their career."

Do look for complements when establishing a mentoring pair. "I would be cautious about matching like with like, such as people with the same personality type," says Fain. "By matching across differences there can be a lot of learning and new perspectives."

FOR MENTEES

DO

Do explain what you want to learn — and be specific about the commitment. "Say, 'I'd love to meet with you monthly and pick your brain on this specific area of expertise for the next six months,'" says Jenn Labin of MentorcliQ, a company that offers software that allows companies to automate their mentoring programs.

Do accept feedback, including constructive criticism, with grace.

Do expect to have many mentors during your career. "One of the myths that I like to break down is that there's a Yoda out there for all of us, one mentor to solve all of our problems. That's not how it works," says Labin. "You can, and should, have several mentors."

DON'T

Don't allow meetings to devolve into gripe sessions. Plan a clear agenda of items to discuss, says Fain. Some social chitchat is fine, but know when to focus on goals and tasks.

> "It's not about simply solving their problem. We have to resist the advice monster because that is a quick fix."
>
> **— Wendy Axelrod**

FOR MENTORS

DO

Do keep a regular schedule: Aim for an hour once a month. Longer lapses between conversations make it harder to pick up the thread of the previous one. Mentorships should last no more than a year, and no less than six months.

Do ask mentees open-ended questions. "Really listen and clarify the questions instead of just giving an easy answer," suggests Usovicz.

Do put mentees to the test. Encourage them to undertake what Axelrod calls "pilot tests," such as offering to lead a high-level team meeting. Then hold a debriefing to ask how the initiative went.

DON'T

Don't break confidences. "If something a mentee has said gets disclosed to the boss, it can be career-damaging," warns Usovicz. Likewise, mentees also need to keep the conversations private. This allows for candor.

MAKE A MENTORING CONTRACT

1. Detail the objectives of the mentorship in a straightforward manner. Stick with two or three priorities.
2. Determine the frequency of meetings. Set the day, time, and location. And establish how long the mentorship will last.
3. Include a clause that says conversations will remain confidential.

RESOURCES

- **Rotary.org/learn:** The Rotary Learning Center course Mentoring Basics explains the responsibilities and benefits of being a mentor to an adult professional.
- **Washington.edu:** Usovicz is a big fan of the mentoring toolkit (in PDF form) offered by the University of Washington Department of Human Resources.

Illustration by James Graham

CALENDAR

October events

2nd to 3rd

WORK HARD, PLAY HARD

Event:
Gears and Beers

Host:
Rotary Club of Wollundry-Wagga Wagga, Australia

What it benefits:
Local charities

What it is:
Are you a cycling and craft beer fanatic? If so, this is the festival for you. A variety of rides that cover every age group, course distance, and cycling level are scheduled throughout the weekend, with all roads leading to the craft beer festival at the finish line. COVID-19 regulations allow for up to 3,000 attendees this year.

3rd

ALL TOGETHER NOW

Event:
Hinsdale Charity Classic

Host:
Rotary Club of Hinsdale, Illinois

What it benefits:
Local charities

What it is:
For the past 26 years, the Hinsdale club has sponsored this family-friendly race. Last year's event was virtual, with each participant running or walking independently. This year, the event — which includes 10K, 5K, and 3K runs and walks — will be held in person again. Overall winners of the 10K and 5K races claim trophies, while age-group winners receive medals.

12th

READY, AIM, CLAY!

Event:
Sporting Clays Classic

Host:
Rotary Club of James River (Richmond), Virginia

What it benefits:
Local and international charities

What it is:
Sporting clays is a form of clay-pigeon shooting, with a course that typically features 10 to 15 shooting stations spread out over natural terrain. In this tournament, teams of five people — from first-timers to experienced shooters — participate. The day includes breakfast, shooting, lunch, and awards.

17th

TAKING IT TO THE STREETS

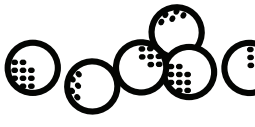
Event:
Thousand Oaks Street Fair

Host:
Rotary Club of Thousand Oaks, California

What it benefits:
Local charities

What it is:
Live entertainment, more than 100 vendors, food trucks, free activities for kids, and a car show are just some of the fun features of this annual street fair. If you fancy yourself a pretty good shot with the ol' bean bag, try your hand at the fair's Corn Hole Classic, where the winning team takes away a $500 prize.

18th



GOLF FOR A CAUSE

Event:
Tee It Up for Veterans Charity Golf Outing

Host:
Rotary Club of Shady Brook (Langhorne), Pennsylvania

What it benefits:
First Swing golf clinics

What it is:
This 18-hole event includes a buffet lunch, on-course refreshments, dinner, and prizes. Proceeds benefit First Swing golf clinics, a progressive form of rehabilitation for veterans who are amputees. The event will feature two courtesy foursomes, one made up of area veterans and the other of students, each representing one of four local high schools.

Tell us about your event. Write to magazine@rotary.org with "calendar" in the subject line.

TRUSTEE CHAIR'S MESSAGE

Rise to the challenge

When Rotary courageously stepped up to pursue the dream of a polio-free world, we knew realizing our dream wouldn't be easy. But since 1988, working with our partners, we've brought worldwide case counts down by 99.9 percent.

However, it's not over 'til it's over. It will take courage. We're going to keep up the funding and keep on the pressure until this fight is finished, and no child ever again has to experience the devastating effects of polio.

As we mark World Polio Day on 24 October, we can take heart; we continue to make progress, and with the current low transmission rates of wild poliovirus in Afghanistan and Pakistan, we have a unique opportunity to interrupt transmission. We also have a new strategy and vaccine that will bolster our eradication efforts.

To eradicate wild poliovirus and stop outbreaks of circulating vaccine-derived poliovirus (cVDPV), the Global Polio Eradication Initiative's new strategy centers around several key areas: political advocacy to create greater urgency and accountability in the endemic and outbreak countries, improved engagement with high-risk communities, improved operations and polio surveillance, and the inclusion of polio immunization in broader health programs. (For more on the new polio eradication strategy, see page 30.)

Along with our new strategy, Rotary and its partners are using a new tool, novel oral polio vaccine (nOPV2), to help address outbreaks of type 2 cVDPV. This new vaccine has been deployed in a growing list of countries and is a promising development in our quest to end polio once and for all.

But there is still much work to be done. In particular, we need to remain strongly committed to our goals in the face of recent events in Afghanistan. As a nonpolitical organization, Rotary will continue to do the work that is necessary to protect the health of children everywhere.

After all the progress we've made in our decades-long fight, the worst thing we could do is to become complacent, so here's where you come in.

Let's raise awareness of Rotary's role in polio eradication. And let's double down on our commitment and keep raising $50 million each year for polio. Remember: Thanks to the Bill & Melinda Gates Foundation, any contribution you or your Rotary or Rotaract club makes will be matched 2 to 1.

In Rotary, when we dream, we get behind our dream with everything we can muster. We have always risen to challenges — and now it is more important than ever for us to rise again, with courage, to defeat polio.

JOHN F. GERM
Foundation trustee chair

SERVICE ABOVE SELF

THE OBJECT OF ROTARY

The Object of Rotary is to encourage and foster the ideal of service as a basis of worthy enterprise and, in particular, to encourage and foster:

First The development of acquaintance as an opportunity for service;

Second High ethical standards in business and professions, the recognition of the worthiness of all useful occupations, and the dignifying of each Rotarian's occupation as an opportunity to serve society;

Third The application of the ideal of service in each Rotarian's personal, business, and community life;

Fourth The advancement of international understanding, goodwill, and peace through a world fellowship of business and professional persons united in the ideal of service.

THE FOUR-WAY TEST

Of the things we think, say, or do:

1. Is it the **truth**?
2. Is it **fair** to all concerned?
3. Will it build **goodwill** and **better friendships**?
4. Will it be **beneficial** to all concerned?

ROTARIAN CODE OF CONDUCT

The following code of conduct has been adopted for the use of Rotarians:

As a Rotarian, I will

1. Act with integrity and high ethical standards in my personal and professional life
2. Deal fairly with others and treat them and their occupations with respect
3. Use my professional skills through Rotary to: mentor young people, help those with special needs, and improve people's quality of life in my community and in the world
4. Avoid behavior that reflects adversely on Rotary or other Rotarians
5. Help maintain a harassment-free environment in Rotary meetings, events, and activities, report any suspected harassment, and help ensure non-retaliation to those individuals that report harassment.

Illustration by Viktor Miller Gausa

IN BRIEF

Members come together for second virtual convention

▲ Convention speakers and performers included (clockwise from top left) 2020-21 RI President Holger Knaack and his wife, Susanne; Chicago-based hip-hop ballet troupe the Hiplet Ballerinas; 2020-21 Rotary Foundation Trustee Chair K.R. Ravindran; current RI President-Elect Jennifer Jones (at right) and Sylvia Whitlock, the first female Rotary club president; poet Idris Goodwin; and German dance crew DDC Breakdance.

Thousands of people experienced friendship and fun at the 2021 Rotary International Convention, held online 12-16 June. The robust program included well-known speakers, breakout sessions, an interactive House of Friendship, and a variety of activities and entertainment.

During the opening general session, 2020-21 RI President Holger Knaack acknowledged that at the start of the COVID-19 pandemic, he had worried about not being able to visit clubs and projects as presidents normally do. The convention itself, originally planned to be held in Taipei, Taiwan, was moved online due to the pandemic.

"But what seemed like a problem turned out to be an advantage," Knaack said. "In a virtual environment, I could visit a dozen Rotary clubs a week and participate in their projects. It was exciting and rewarding. And," he told Rotary members, "I was so proud of the work you did in such difficult times."

Despite the challenges of the past year, there were also successes: Knaack highlighted the World Health Organization's declaration that its African region was free of wild poliovirus. He encouraged members to build on that positive news by staying focused on Rotary's commitment to ending polio worldwide.

In a video address, WHO Director-General Tedros Adhanom Ghebreyesus also gave Rotary credit for continuing the work to eradicate polio. "When COVID-19 struck, you didn't abandon your vision of a polio-free world. You redoubled your efforts," he said. "I want you to know that your investment in public health will inspire future generations to live up to your motto of Service Above Self."

The closing session featured Seth Berkley, the CEO of Gavi, the Vaccine Alliance, which is a member of the Global Polio Eradication Initiative. Gavi is also a co-leader of COVAX, a worldwide initiative aimed at establishing equitable access to COVID-19 vaccines. More than 1.4 billion people have already been vaccinated against COVID-19, Berkley said, and by the beginning of next year, COVAX plans to make more than 1.8 billion doses of the vaccine available to people living in 92 lower-income countries, many of whom would otherwise have limited or no access to the vaccine.

"Now with COVID-19 vaccines flowing, it's going to be critical to maintain hard-won gains in immunization to recover from the disruptions caused by COVID-19 and achieve even more by leaving no one behind in any situation or at any stage of life," Berkley said, adding that Rotary will play a key role in that work.

Other convention speakers included Bruce Aylward, a senior adviser to the WHO director-general; Eliud Kipchoge, an Olympic gold medalist and marathon world-record holder; Vanessa Nakate, a climate activist and founder of the Rise Up Movement; Anna Rosling Rönnlund, the vice president of the Gapminder Foundation; and Sanj Srikanthan, the CEO of ShelterBox. The general sessions were emceed by Mark Wright, a news anchor and member of the Rotary Club of Seattle.

Convention attendees enjoyed performances by the Filharmonic, an a cappella group; dance ensembles DDC Breakdance and the Hiplet Ballerinas; and poet Idris Goodwin. They also participated in virtual activities that included yoga and cooking classes, a trivia challenge, a dance party, a photo booth, and a 5K walk to raise funds to end polio. — RYAN HYLAND

Rotary International

HOUSTON CONVENTION

A big canvas

One of the delightful aspects of Houston is its eye-catching public art, which expresses the city's lively and diverse culture. While you're at the 2022 Rotary International Convention June 4-8, make sure to take in some of the incredible murals and mosaics on display around the city.

If you are near the hip EaDo (short for East Downtown) neighborhood, check out the "Abstract Happy Beach Wall" at 801 Chartres St. The vibrant colors of the mural, painted by Barcelona-based artists Zosen and Mina, can make any day feel sunny. Or take a stroll around Market Square Park in the nearby Historic District and see the "Houston Is Inspired" mural, a design so full of life that it will give you enough energy to explore the entire city.

At Smither Park, a public park dedicated to sustainability, you can view beautiful creations made with bottle caps, broken ceramic tiles, seashells, and other found items. The park is located at the edge of the Third Ward and East End neighborhoods. One element is known as the "Memory Wall":

Courtesy of Orange Show Center for Visionary Art

With 60 panels by artists from all over the world, it serves as a tribute to lost loved ones and memories past. The park is also home to the Lindley Fish Amphitheater, a performance space created by artist Matt Gifford that utilizes old street signs, shattered mirrors, and antique picture frames to form a giant fish mouth.

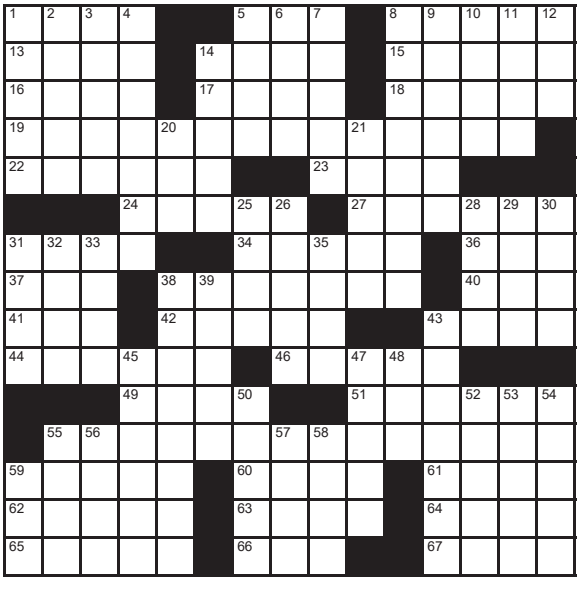
End your visit to Smither Park in the Marilyn Oshman Meditation Garden, an all-white installation that compels you to focus on the fine mosaic details. Recycling pieces from domestic spaces like the kitchen and dining room, this garden proves that there's no place like home — except Houston. — MIYOKI WALKER

Learn more and register at **convention.rotary.org.**

CROSSWORD

Investment strategy
(No. 6 in a series)

By Victor Fleming
Rotary Club of Little Rock, Arkansas



ACROSS
1 Visit a grocery, say
5 Hound's hand
8 Counterpart of chaos
13 Rabbit's kin
14 Lacking color
15 Nary a soul
16 Hunter of fiction
17 Skin-cream element
18 Jelly beans and chocolate bars
19 Phrase found often on our organization's website
22 American spotted wildcat
23 Arizona city on the Colorado
24 Ax and adz
27 Bestseller-list entries
31 Hardly hard
34 Actor Kevin
36 "__ we there yet?"
37 Calendar abbreviation
38 Developing
40 Foil metal
41 __ glance
42 Haile Selassie devotee, casually
43 Classic guitarist Atkins
44 Freak out
46 Energy, informally
49 2000 movie based on Marvel Comics characters
51 Prophet at Delphi
55 Market and networking systems of a specific community
59 Bar mixer
60 Ice cream holder
61 Annoying child
62 Angle type
63 Texas town with a club that meets at The Club at Falcon Point
64 Fashion designer Marc
65 Acted snoopy
66 __-mo replay
67 Rough file

DOWN
1 Valiant woman admired by many
2 Chaos
3 Address a crowd
4 Court fine
5 Buds
6 Matty, Felipe, or Moises
7 Full of tears
8 Approaching, as traffic
9 Respond to with raucous laughter
10 "__ do that!"
11 They may be offensive
12 Spanish king
14 Words on a check
20 Friend of Pooh
21 Stage, as a drama
25 Wall St. takeovers
26 Tended
28 Latticework slat
29 Pennsylvania port or lake
30 Shipped, as a package
31 List shortener, for short
32 Dealer offering
33 Atlas's blue areas
35 *Arrivederci* alternative
38 Displayed anguish
39 Honey-loving badger
43 __ of commerce
45 Arouse
47 Legal tender
48 For, in a debate
50 Fretful places?
52 Approximately, datewise
53 Hose problems
54 Block legally
55 In __ parentis
56 Burden of proof
57 Locomotive fuel
58 Not falling for
59 Light brown

Solution on **page 12**

Wing man

Rotary member collects insects — and their stories

Steven Kirkpatrick
Rotary Club of North Suffolk, Virginia

WHY I STARTED: My brother got me into collecting insects. He has a PhD in entomology from Berkeley. When my sons were young, he presented them with a beginner's insect-collecting kit. I started by just going out with the boys. It's a great father-son activity.

WHY I KEEP GOING: There is an infinite mystery and beauty to even the smallest details of an insect. Pretty much all of these creatures you're looking at didn't start out this way. They began as a larva or a nymph and went through some sort of metamorphosis to become an extraordinary insect that might live only a couple of weeks.

BEHIND THE NAME: The bigger black and yellow butterfly is the tiger swallowtail. It's the state insect of Virginia. You see them here pretty much every day. The name of my property is Swallowtail Farm. When we bought the place, it was called Eagles Swoop. I didn't like that name, because eagles don't really swoop and all of the birds up there were actually vultures.

KILLER WASP: The black and yellow wasp is called a cicada killer. It burrows into the ground and then finds a cicada, paralyzes it, brings it into the burrow, and lays an egg. Then the wasp seals that hole, and when the larvae hatch, they eat the cicada.

Photography by Tyler Darden

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Sign in to My Rotary, tap Learning & Reference, tap Learning Center, and you'll be on your way!

Rotary

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