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SCIENCE \_ CLIMATE SCIENCE

## In a time of division, could science find a way to unite?

### BRIDGING DIVIDES

At an annual gathering, concerned scientists discuss how to navigate distrust and make science for everyone.



Steven Senne/AP



• Eva Botkin-Kowacki

Staff writer | [\\_@EBotkinKowacki](#)

**FEBRUARY 22, 2017 BOSTON**—In the increasingly divisive political atmosphere, many Americans appear to be aligning themselves as if ready for battle. But in the science community, some are arming themselves for conversation rather than a fight.

As hundreds of scientists across disciplines gathered in Boston, Mass. for the annual meeting of the American Association for the Advancement of Science (AAAS) last week, many grappled with how to bridge the growing divide separating scientific consensus from public understanding and policy discussions.

For some scientists, the widening gulf is a rallying call to demand respect for science and evidence-based decision-making from policymakers. For others, it underscores the need to better understand how the gap formed and to find new ways to bridge it.

These scientists say the emerging narrative that pits an "educated elite" against "ignorant masses" is overly simplistic and counterproductive. Science doesn't solely belong to scientists, and suggesting that only credentialed researchers are smart enough to understand its implications and engage with it is fundamentally flawed, suggests Rush Holt, a physicist and the chief executive officer of AAAS.

"We probably have ourselves to blame – scientists," he told The Christian Science Monitor in an interview ahead of the meeting. "We've allowed a gap to form, to even widen, between those who do science and those who don't. So people who don't do science say, 'Well, science is what scientists do,' rather than saying, 'It's a way of gathering and evaluating evidence that I, too, can use.' "

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Some scientists have suggested that the problem is an educational one. Those who disregard science and scientific consensus as not for them simply don't have the knowledge – the facts, according to this thinking. And, as Dietram Scheufele, a professor of science communication at the University of Wisconsin-Madison pointed out in a talk at the AAAS meeting, in the current "fake news panic" that mentality can fuel an impression that "if they just had the correct facts, they could make better decisions."

That notion, referred to as the "knowledge deficit hypothesis" in academic circles, is problematic, Dr. Scheufele said. It bestows a sort of responsibility and expertise on those in the know to impart knowledge on those who are not, and ignores the fact that the lay public has anything to contribute to the conversation.

That idea, Asheley Landrum, a cognitive scientist at the Annenberg Public Policy Center at the University of Pennsylvania, explained in a talk at the AAAS meeting, suggests that "any public skepticism or negative attitudes toward science is due to the fact that people just don't know enough and that if they only knew more, that they would accept it."

But studies testing this theory have shown that added science knowledge only slightly increases subjects' acceptance of scientific consensus on polarized issues, like climate change for example. This suggests that it's not necessarily that people don't know or understand what experts are saying on a topic, Dr. Landrum said. "They just choose not to align with it."

And that choice may have more to do with worldview than any active dismissal of the scientific perspective.

According to Dan Kahan, a psychology professor at Yale Law School, people stick with their tribe and align their views on a scientific topic according to their political, religious, or other identity. And, he finds, this is true for both liberals and conservatives, Republicans and Democrats. For example, someone who is liberal is more likely to dismiss information that challenges the liberal perspective on an issue, whether or not it is factual. Similarly, they seek out news reports and data that is in line with their own pre-existing views.

Landrum suggests that one way to cut through this divide might be simply to pique people's interest in learning about science for the sake of their own curiosity. She posits the "curiosity deficit hypothesis" as the real driver behind polarization of scientific knowledge. The idea is that someone who is motivated to learn more about a scientific topic for personal satisfaction rather than a specific utility will be more open to scientific knowledge that might contradict their previously held viewpoint.

Although Landrum has yet to work out how to spark someone's curiosity, she said the goal is to eliminate the polarization of science, the sense that there are two conflicting options, so people are more open to understanding what scientists are reporting – whether or not it aligns with what their political, religious, or other kind of tribes are asserting.

Recognizing that anyone can think scientifically, and that science isn't just about having knowledge but a way of gaining it, could be an important way to bridge that gap as well, said AAAS's Dr. Holt. "You don't have to wear a lab coat to be able to ask questions so that they can be answered empirically and verifiably."

People in all walks of life employ the scientific method in their daily routines, he notes. Mechanics use it to diagnose engine problems, bakers use it to perfect their confections, and truckers use it to determine the most efficient routes.

In Asia, some rice farmers are so knowledgeable about their crop and the ecology of the area that they are referred to as expert farmers, Barbara Schaal, an evolutionary biologist at Washington University in St. Louis and president of AAAS, told the Monitor ahead of the meeting.

These farmers didn't go to school to study nutrient density or soil composition or agricultural hydrology. But that doesn't stop them from using science to figure out the best way to grow their crop.

Dr. Schaal observed one farmer who discovered a genetic mutation in his field conduct an experiment to figure out why his rice had turned out purple instead of white.

"He was a rice farmer, and he was curious," Schaal said. And as a result, he used the scientific processes without even knowing it.

But those scientists with PhDs and published papers are unsettled by terms like "fake news" and "alternative facts" appearing in dialogues today. To some of them, their expertise and any consensus among them that has been years in the making is undermined by a growing trend toward doubting scientists and scientific evidence.

"We live in a world where people are trying to silence facts," Naomi Oreskes, a professor of the history of science at Harvard University, told the audience during a speech at the AAAS annual meeting. "We need to speak for facts because facts don't speak for themselves."

Science is supposed to inform policy decisions, to provide evidence so that policymakers can make informed decisions, Jacquelyn Gill, a paleoecologist at the University of Maine, told the Monitor. But if there is disagreement over the science itself, rather than the policy implications of the science, that undermines that relationship, she said.

Dr. Gill and others have decided to rally and to march as a way of drawing attention to the importance of science in our society. This is not to be confused with advocating for more funding or support for scientists *per se*, she explains.

"I'm not interested in a scientists' march," Gill told the Monitor. "What I'm interested in is a group of people that stands up for science, science as evidence-based decision-making, science as publicly accessible, transparent. Science for everyone."

She and other scientists in Boston for the meeting spoke at a rally in Copley Square timed to coincide with the meeting on Sunday. There is a "March for Science" planned for Earth Day (April 22) in Washington D.C. as well.

Dr. Oreskes also spoke at the rally, which was intended to generate energy in support of science, scientific principles, and the conditions necessary for science to be conducted – including open scientific dialogue across international boundaries. At the rally she told the crowd, "It's not political to defend the integrity of facts."

An open event like Sunday's rally invites a variety of political and activism expression, and it is difficult to control the message of such a demonstration. Some of the signs toted by rally attendees aligned with Gill's sentiment of unity and celebrating science, with messages like "Science builds bridges" and "Science is for everyone."



Eva Botkin-Kowacki/The Christian Science Monitor

**Caption**

But some signs were more overtly political, with messages like "Real Science, Fake President," or "Impeach":



Eva Botkin-Kowacki/The Christian Science Monitor

**Caption**

Although such rallies might get the attention of policymakers and the public, the language used could drive a wedge further between scientists and non-scientists.

Kahan cautioned against divisive language. Rallying calls such as "Make America Smart Again" and calling those who don't trust science "dummies" attaches resonances of the identity-based resistant responses, he said in one of his talks at the meeting. Instead, he suggests that personal connections and less antagonistic dialogues will be more productive to bridge gaps on polarized science issues.

Connecting with others, rather than lecturing them, is key to unifying, Scheufele said. "We need to shift from the communication *of* science to the communication *about* science."