

2008 MEDALS & AWARDS

GSA PUBLIC SERVICE AWARD

Presented to **Richard B. Alley**



Richard B. Alley
Pennsylvania State University

Citation by David M. Diodato

It is fitting that on the day I called Richard Alley at Penn State to congratulate him for receiving the GSA Public Service Award, he was up on Capitol Hill engaging with decision makers discussing global climate change. It was for his work on global climate change that Alley and the other members of the Intergovernmental Panel on Climate Change shared the Nobel Peace Prize with Al Gore in 2007. Alley demonstrates by his actions the profound insight that science by itself is necessary but not sufficient to inform public policy decision making. Also required is clear, credible, and effective communication. Over more than two decades of expanding the frontiers of knowledge about global climate change through leading-edge science, Alley, as a citizen-scientist, has recognized the imperative to communicate his scientific understanding in language that is clear and understandable to the public and to those empowered by the public to make decisions for society.

In his book, *The Two-Mile Time Machine: Ice Cores, Abrupt Climate Change, and Our Future*, Alley clearly communicates the significance of global climate change preserved in ice cores collected in Greenland. For that publication, Alley was awarded the 2001 Phi Beta Kappa Book Award in Science. Since then, Alley has maintained a vigorous schedule of public communications. His contributions to the open courseware initiative further demonstrate his strong commitment

to public service through education; beyond the 1,000 students who enroll each semester, his informative and accessible online course is available throughout the world, regardless of ability to pay. If you haven't seen it, I strongly recommend Richard's musical turn as Johnny Cash explaining seismology—singing, "So you're not dyin', we watch the line" (http://streaming.ems.psu.edu/geosc10/watchtheline_medST.mov).

Global climate change may be the greatest challenge ever faced by humanity. In awarding the Public Service Award to Alley, GSA recognizes not only the significant scientific contributions of an individual member, but also the significance to humankind of the global climate change research that Alley has embraced as his life's work.

Response by Richard B. Alley

Thank you, Dave, and GSA, for this honor. I am humbled.

Almost all of us learned long ago that scientific certainty, like economic certainty or political certainty, is an oxymoron. We can be certain only if we're allowed to make up all of the rules, and I know of no mortals who have been granted that power over the real world.

And yet, somehow, life goes on. Laws are passed, budgets enacted, judgments handed down, houses built, marriages pledged and births celebrated. When faced with the great unknown, almost all of us get out of bed, just to see. Besides, even though we know nothing with complete certainty, we still know a whole lot with really high confidence. The sun will rise, the wind will blow, the taxes will be collected, and at least most of our friends will be there when we need them, perhaps with a few friends we didn't even know we had.

As geoscientists, we know a lot of more-specialized things with high confidence, too. Poisons dumped on the ground will get into someone's water, volcanoes and floods and earthquakes and tsunamis will occur, Earth resources recovered at existing prices with existing technology will run out, changing the concentration of radiatively active gases in the atmosphere will change the climate, and water pollution, natural disasters, resource depletion, and climate change will influence us.

And yet, something odd sometimes happens when our uncertain-but-confident knowledge meets public discussion—participants may demand certainty. When and

where exactly will the volcano erupt, so we don't need to evacuate a minute too early. Prove that the water pollution caused the cancer. And don't address the climate and the composition of the atmosphere until you're absolutely sure that we're causing it.

A few of you may have already heard my next story, but I hope it bears repeating. During grad school, I was in Antarctica, being questioned by a rather imposing military airlift commander about the probability of encountering a crevasse at the summit of the Greenland Ice Sheet. After I explained the several reasons why a crevasse was highly unlikely there, he emphasized his concern, suggesting that if his plane fell in a crevasse after my advice, he would return, lock my private parts in a vise, set the table on fire, and give me a butcher knife. I then suggested a bit of insurance (which he surely already knew)—reconnaissance, followed by a "ski drag" (flying while dragging the skis to break any snow bridges over crevasses), then surveying the snow condition again before landing in the dragged region. No crevasses were encountered, as expected, but to the best of my knowledge the ski drag was conducted before landing.

As public servants, we face a steep and challenging task—to explore with policymakers and the general public the reality that we scientists are neither godlike nor stupid or conniving, that insurance is often cheap but rarely free, and that further research can narrow the uncertainties notably and bring the cost of insurance closely into line with the risks but cannot entirely eliminate—the probabilistic nature of the situation. And we must do so knowing that our measured discussion will be interrupted by people from many sides with agendas and sound bites that often appear more compelling than we do.

I believe that few of us entered science with any idea of facing this task—I know I didn't! And I believe that most of us enter the public discussion hesitantly—the endless frontier of science is more fun than the seemingly endless fighting around some issues where science meets politics. Furthermore, the great remaining uncertainties, the great prospects from further research, require that we as a community continue to pursue the endless frontier of science. But the widening circle of light from research illuminates a longer and longer perimeter of people who seek help in understanding what they can suddenly see. These are the people who pay for us, so we must respond. We must assess science,

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not just do it, and we must communicate the results of those assessments clearly, honestly, and respectfully.

I have been privileged to play a small role in this effort, with the National

Academy of Sciences, the United Nations Intergovernmental Panel on Climate Change, the US Climate Change Science Program, and in other ways including teaching a lot of bright students at Penn State, and today you

are honoring our joint efforts. I thank many, many colleagues, mentors and students, and especially my family—you know who you are, because I spend so much time leaning on you.