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## Am I Wrong?

I HAVE SEVEN GRANDCHILDREN, AND I WORRY ABOUT THEIR FUTURE. THE NATION THAT I WAS RAISED in, the United States, has clearly lost its way at a time when the world badly needs wise leadership. Nations with a long-term view are making huge investments in their infrastructure—transportation, water, energy, waste, and recreation. And they have a laserlike focus on supporting science and engineering research with government resources. As examples, Germany, China, and South Korea come to mind. Meanwhile, the United States is living off its past. Not only do we face a crumbling infrastructure\* but our federal investments in fundamental long-term R&D have been stagnant, dropping from 1.25% of the gross domestic product (GDP) in 1985 to 0.87% in 2013.† Now, on top of that comes a mindless budget “sequester” that will make the situation considerably worse, causing the U.S. National Science Foundation to announce last week that it may award 1000 fewer research grants in 2013 than it did in 2012.

Governments might justifiably be considered deranged when they fail to take actions today that will generate tremendous future benefits. Consider the fact that human lifespan is increasing, and, without a medical breakthrough, 1 in 5 of those who reach the age of 85 are projected to have Alzheimer’s disease. Without research that reduces this terrible burden, the Alzheimer’s Association estimates that the costs associated with this disease and other forms of dementia in the United States will increase fivefold by 2050, to \$1.1 trillion a year. Given that 70% of such costs are expected to be billed to Medicare and Medicaid,‡ the U.S. government is clearly being “penny wise and pound foolish” by cutting the fundamental research in physics, chemistry, mathematics, and biomedicine that can be expected, in some way that is completely unpredictable today, to prevent this terrible disease. And of course, no financial cost can begin to reflect the terrible toll of old-age dementia on human happiness.

I was fortunate to become a scientist at a time when the U.S. system of research was flourishing, thanks to visionary national leadership. It is no accident that the U.S. economy and global status subsequently flourished, or that the success was built in partnership with many of the best minds from other nations. The brilliance of U.S. science and engineering enabled its universities to attract a very large number of the most energetic and talented students from around the globe. A major fraction of these young scientists and engineers decided to remain here after their training, where they have made enormous contributions not only as academic leaders but also as leaders in industry and government. As one indicator, for both the U.S. National Academy of Sciences and National Academy of Engineering, 25% of members were born outside of the United States, even though they had to be U.S. citizens to be elected. It is hard to imagine a Silicon Valley, or any of the other U.S. centers of innovation, prospering without such talented immigrants.

Other nations have been increasing their research intensity at an impressive pace. With the latest cuts created by the shortsighted political gridlock in Washington, DC, are we headed to a future where the world’s most talented young scientists and engineers no longer want to pursue careers in the United States? If so, in what nation will the next Silicon Valley be developed? The declining opportunities for research funding have made survival for some of the most able researchers resemble a lottery—or perhaps Russian roulette is a better analogy. The effect on the U.S. research system seems devastating. Am I wrong? To what extent do you think the current grant-funding environment is undermining the intellectual environment and creativity in your institution? Post comments at [http://scim.ag/wrong\\_comments](http://scim.ag/wrong_comments), and take the *Science* poll at [http://scim.ag/wrong\\_poll](http://scim.ag/wrong_poll).§

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– Bruce Alberts

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\*[www.asce.org/reportcard](http://www.asce.org/reportcard). †[www.aaas.org/spp/rd/guihist.shtml](http://www.aaas.org/spp/rd/guihist.shtml). ‡[www.alz.org/alzheimers\\_disease\\_facts\\_and\\_figures.asp#expanding](http://www.alz.org/alzheimers_disease_facts_and_figures.asp#expanding). §Polling results reflect only the votes of those who choose to participate.