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Why Scientists Should Embrace the Liberal Arts

Science alone isn't enough to solve the world's problems

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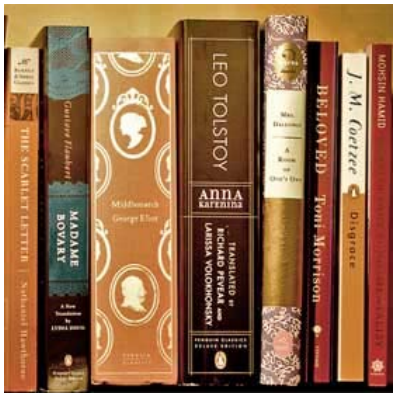

Image: *Edwina Hay*

Science has two important yields: increased understanding of the world within and around us ("knowledge for knowledge's sake") and solutions to specific problems. But even the most profound scientific knowledge won't solve world problems such as hunger, poverty and environmental damage if we fail to respect, understand and engage cultural differences.

The resistance to vaccine use is a prime example. The supposed link between autism and common childhood vaccines was based on fraudulent research published in the British journal *The Lancet* in 1998. After the fraud was uncovered the lead author was stripped of his medical license and the article was retracted. Subsequent investigations by the Department of Health in the U.K. and the Institute of Medicine of the National Academies in the U.S. as well as a definitive study published in the August 2013 issue of *The Journal of Pediatrics* have all debunked the vaccine–autism link. Yet the percentage of parents who delay or forgo immunization of their children has increased alarmingly in recent years and, partly as a result, measles, mumps and whooping cough are making a comeback.

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Similarly, genetically modified organisms, global climate change and other scientific, medical and public health developments sometimes fail to gain public acceptance for reasons that lie far outside the realm of science. And that is not the fault of the public—that is our fault as scientists. We have not been effective in explaining to the public the scientific method, the peer review system or the self-correcting nature of scientific research.

When we can't make headway against misinformation campaigns based on bogus science or political agendas, clearly something more than the robustness of our data is at play. To use that classic line from the Paul Newman movie *Cool Hand Luke*, "What we've got here is failure to communicate."Scientists need not only to explain much more clearly and compellingly what we are doing but also to establish on social, cultural and emotional levels why our work is important. We need to respect cultural differences that lead to misunderstanding and even fear of science.

Too often we also fail to respect opinions that differ from our own. Science is a process of iteration—of back-and-forth—and yet sometimes we scientists are guilty of promulgating our own biases. Our subsequent disagreements—some based on differing data but many based on differing opinions—make it that much more difficult for the public to know whom or what to believe.

The public's lack of scientific understanding limits the effectiveness of our work as well as our ability to garner the financial and political support we need to carry it out. As a result, our ability to generate knowledge and solve problems is suffering.

Unfortunately, scientists are not always rewarded for effective public communication. In fact, engaging the public can carry a stigma, a signal that one is not a "serious" scientist. And so many of us prefer to follow a surer, safer path by only publishing our research in professional journals, only speaking at meetings of specialists like ourselves. Moreover, many of us never received the education in the humanities or social sciences that would allow us to explain to nonscientists what we do and why it is important.

One example of the kind of approach that can help comes from Alan Alda, star of the long-running television show *M*A*S*H** who also hosted PBS's *Scientific American Frontiers* series for a dozen years. Through the Alan Alda Center for Communicating Science at the Stony Brook University, S.U.N.Y., School of Journalism, Alda and his colleagues are helping graduate students, scientists and health care professionals communicate more effectively with those outside their fields. Their message to scientists: skip the jargon and tell your stories in language that the public can understand.

But to be truly effective, we must start much earlier. What we really need is a much broader humanistic education for scientists (and nonscientists), beginning in K–12 education and continuing through the undergraduate/graduate and professional years. It is through the study of art, music, literature, history and other humanities and social sciences that we gain a greater understanding of the human condition than biological or physical science alone can provide.

We also need to teach people who will never be scientists basic numeracy. We need to give them an understanding of the scientific method and the ability to analyze, synthesize and critically assess what "the experts" tell them. With this wider understanding we can better explain our research in terms that the public can understand, appreciate and act on.

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