MAIL TO THE CHIEF

“Reality must take precedence over public relations, for nature cannot be fooled.” —Richard P. Feynman

Eighteen years ago, then president of the United States George H. W. Bush addressed the National Academy of Sciences, stating: “Science, like any field of endeavor, relies on freedom of inquiry, and one of the hallmarks of that freedom is objectivity. Now more than ever, on issues ranging from climate change to AIDS research to genetic engineering to food additives, government relies on the impartial perspective of science for guidance.”

It is hard to find a better statement of what the relationship between science and public policy should be. Science should be a tool to help policymakers understand the world as it is, and as it might be. Science itself doesn’t tell us how best to organize our society to maximize opportunity and happiness, but it can help inform our decision making.

The results of scientific inquiry are themselves neither good nor bad, though science does have an ethos. That ethos involves honesty, integrity, and full disclosure. As the Nobel Prize–winning physicist Richard Feynman said: “The only way to have real success in science...is to describe the evidence very carefully without regard to the way you feel it should be. If you have a theory, you must try to explain what’s good about it and what’s bad about it equally. In science you learn a kind of standard integrity and honesty.”

That characteristic, the fact that one must be willing to examine all the data, both good and bad, before developing conclusions, is something that should carry over directly to public policy, however. Too often those in government are tempted to seek out those data that support their policies. But when this is done as justification for enacting legislation, the results are bound to be similar to the results of an experiment based on a bad theory. Democracy flourishes when there are informed legislators and an informed electorate. This means that our government will function best when the results of scientific inquiry are made freely available to both voters and those they entrust with their governance.

There is another facet of science that lends itself well to democracy, and perhaps that is one reason why it has tended to flourish in democratic societies. That is anti-authoritarianism. There are no scientific authorities. There are scientific experts, but there should be no authority figures whose statements are not subject to question by anyone. For government to function well, the same sense of openness needs to pervade all public activity.

That brings up another of the great values of science. Science generally functions by unambiguously determining what is wrong, not what is right. Nature tells us what is wrong by explicitly singling out those ideas that do not agree with the results of repeated experimentation. Ultimately, the correct ideas are harder to pin down. Even those models that appear to pass the test of experiment need to be continually checked against data to see if they need to be refined. But by keeping those things that work and discarding those that don’t, we eventually get closer to truth.

It is in this way, by distinguishing incorrect ideas and discarding them, that science has produced the progress it has over the past 400 years. And the process produces a truly open mind. One of the greatest experiences scientists, indeed anyone, can have is to have some truly and deeply cherished idea proved wrong by the evidence of reality, for only in this way can we learn to look beyond our a priori prejudices and be willing to judge the world for the way it is, not the way one would like it to be.

Rational public policy should also be based in this way upon empirical evidence. Those ideas that fail the test of experiment should be abandoned, even if they conform to our personal moral inclinations. For example, we currently spend over $200 million dollars a year in this country on abstinence–only sex education for our children, in spite of the fact that scientific studies have demonstrated (the most recent 10–year study appeared in April 2007) that this is not the most effective form of sex education. If we are truly interested in reducing unwanted pregnancies and the abortions that often accompany them, as well as the prevalence of sexually transmitted diseases, all of which are on the rise, we need to focus on programs that work.

Next, one of the most important and at the same time one of the most misunderstood aspects of science that is particularly relevant for its impact upon policy is this: Science does not provide merely another story about the world. It is a story with logical consequences. Choosing to accept some aspects of the story but not others is logically inconsistent, and policies that result from such inconsistency will be flawed. For example, as much as you may not wish to alienate those who feel that their religious beliefs require them to claim that the world is 6,000 years old, it is vitally important to realize that a 6,000–year–old earth is in conflict with everything we know about physics, chemistry, biology, geology, and astronomy. Such a belief is inconsistent with boarding Air Force One and expecting it to fly. The same laws apply in one case as in the other.

You, as president, must support tolerance for individual sensibilities, religious or otherwise. But when people’s beliefs are inconsistent with what science has told us about the world, you must have the courage to lead rationally and the communication skills to help carry the nation along with you.

Finally, I would be remiss if I did not mention the greatest challenge to peace that science has created for any president: a world full of nuclear weapons. While science created these threats to civilization, rational thinking based on empirical realities can perhaps lead us to a world that is not held hostage to them.

Sixty years ago, after nuclear weapons were first used in war, Albert Einstein said: Everything has changed, save our way of thinking. You have the opportunity, as president, to finally lead such a change. It may be the most important thing you can accomplish for peace and security throughout the world.

I wish you the best success and the wisdom to once again restore the relationship between science and public policy to its rightful place in government.

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