

Trust in science under attack

Naysayers from the right, left and in government undermine scientists' crucial role

"For scientists, reality is not optional."
Barbara Kingsolver
 in her novel *Flight Behaviour*

A disturbing anti-science current seems to be running through some elements of Canadian society these days. At its worst, it is a culture of denial of reality. This trend can be seen in the recent decision in Windsor to stop fluoridating the water. It also manifests itself in the federal government's decision to eliminate the long-form census in favour of a voluntary form and in how the government's own scientists are clearly being muzzled from speaking freely about their work.



DREW MONKMAN

OUR CHANGING SEASONS

According to Gordon McBain, a former assistant deputy minister at Environment Canada, federal government scientists can talk freely only through science journals but not to the media. New media relation protocols stipulate that what scientists say must be pre-approved before speaking publicly about their research findings – research which is publicly funded by taxpayers.

When governments make decisions, the scientific and/or statistical evidence on which those decisions are based has to be open and understandable to Canadians. It needs to be out there in the public forum. The role of science is to provide that information openly. Otherwise, the whole decision-making process can begin to look like a conspiracy where policy is made without an evidential base. To give one example, Environment Canada scientists should be able to correct politicians and business leaders who make scientifically incorrect statements about issues such as climate change.

This week, however, I'd like to talk primarily about anti-science attitudes held by parts of the public at large, including some environmentalists. Let's start by being clear on what we actually mean by "science." It is simply a method of making claims about reality that are supported by empirical research (direct and indirect observation or experience) and have reproducibility (the ability of an entire experiment or study to be reproduced, especially by someone else working independently). Science is the most dependable path to understanding the reality of the world. Accepted scientific ideas are reliable because they have been subjected to rigorous testing in a system of checks and balances where ideas and theories come under close and regular scrutiny by an entire scientific community.

BIAS CUTS BOTH WAYS

No one is free from political bias. Unfortunately, the same can also be said to a certain degree about scientific bias. In the past, we have always associated anti-science beliefs with the political right. Despite countless scientific studies and findings to the contrary, some conservative-minded people continue to refute well-established scientific facts such as the theory of evolution and human-induced climate change. Increasingly, however, some people who tend to be left of centre on most issues – including some environmentalists – are being taken to task for their own mistrust or denial of science. Their anti-science bias is most prevalent when it comes to anything "unnatural," and often applies to food or food additives, fluoridated water and sometimes even vaccinations. A certain amount of anti-science bias is also present regarding energy options such as nuclear or natural gas extraction through fracking.

WHY WE ARE BIASED

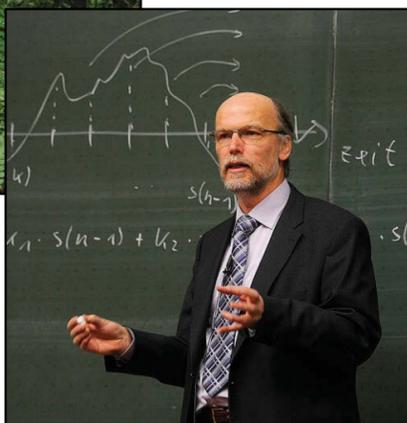
Our biases can be linked back to our moral foundations. Conservatives, or people who are right of centre in their politics, tend to emphasize moral values such as rule of law, family, religion, obedience to authority, national pride and, not surprisingly, conserving the present way of doing things. All of these can be good things, of course, given the context. According to Michael Shermer, an American science writer and columnist in *Scientific American*, the political right was very much against the eugenics movement (practices that improve the genetic traits of the human population) of the early 20th century, a movement that had a lot of support from certain scientists and progressives. It was opposed by conservatives, however, which was certainly a good thing.

But conservative-minded moral foundations are not helpful when it comes to deal-breaker threats like climate change. Conservatives tend to have fixed beliefs that don't change, even in the face of piles of data and proof to the



Wikimedia photos

Whether they are working in the field or the laboratory, scientists need to be free to pursue their research and speak out about the results. A recent trend to greater government monitoring and censorship of scientific research has many people worried, and has added to an atmosphere of distrust of scientific results from both the left and right sides of the political spectrum.



contrary. It is the kind of thinking that we see coming from Ottawa right now.

On the left, the moral foundations are somewhat different. We see an emphasis on protection of the disadvantaged, greater social equality, a strong welfare state, less obedience to authority, greater protection of the environment, distrust of corporations and, for some, the need for "purity" in nature, especially when it comes to what we put in our bodies. These moral foundations may make it hard for environmentalists and people on the left to back down and change their thinking – even in the face of scientific proof – since they often believe that they occupy the moral high ground. Harbouring an anti-science bias does not help one's moral case, however.

CORPORATE VS. GOVERNMENT

"If the left is going to wrong about science, it usually comes down to a distrust of a corporation or corporations in general, or they think that some underprivileged group is going to get hurt," says Chris Mooney, an American journalist and academic who focuses on science in politics. Corporations set off all of the left's alarm bells, the best example being Monsanto and its involvement with genetically modified organisms (GMOs). By the same token, many on the right would trust science more if it wasn't seen as an excuse for big government.

Still, it would be unfair to say that science denial is present in equal proportions, no matter what your moral foundations or political leanings. Progressive, liberally-minded people do trust science much more than conservatives. Clearly, science challenges the beliefs of conservatives to a greater degree than it does liberals and often upsets the apple cart. Conservatives have a need for fixed beliefs that don't change and a need for certainty. For some conservatives, that is why evolution is so difficult to accept as true. It is completely inconsistent with a literal reading of the Bible.

The scientific findings about climate change also challenge the conservative world view because, as framed by the left at least, addressing the problem will almost certainly mean more government intervention and some form of carbon tax. These kinds of solutions dovetail more easily with the values held by the left. Many conservatives therefore tend to double down in the face of the science of evolution and climate change while most liberals tend to accept them.

GOING FORWARD

If we are to address the staggering environmental challenges the world is facing, we can't let our political leanings colour what we choose to believe or not believe when it comes to science. We have to apply reason to any and all ideas with no sacred cows allowed, neither on the part of the political left or the political right. If we, as environmentalists, are to have the moral authority to effectively use scientific findings to influence decision-making on issues such as climate change, we cannot at the same time deny what science is saying on other contentious issues, namely those that don't fit our worldview quite as well. An anti-science bias is bad for society. It allows decisions to be made that are based on ideology rather than on reality.

As a society, we can't accept claims on faith or anecdotal evidence. We must accept that the scientific method is best suited to the purpose of getting at the

truth. That means having to change your mind when science proves that your beliefs or "facts" are wrong. This will demand a change of attitude on the part of the left, as well. As we move towards a planet of up to 10 billion people by 2050, technology is going to have to play an even greater role than it has in the past if we are to avoid a total trashing of the biosphere. There is no going back. We will need to go with the best science available, even if it means

embracing GMOs and energy sources such as nuclear energy and natural gas from fracking.

Unfortunately, finding out where the scientific consensus lies on a given issue is not always easy, especially in the age of the Internet where websites expounding every possible viewpoint and conspiracy theory are rampant. Probably the best approach is to try to find a good review article on the topic in the scientific literature. These are

articles that attempt to sum up the current state of the research. A simple Google search ("review articles" plus the topic you are interested in) will often direct you to these articles. Another way to proceed is by going through Wikipedia. For example, if you go to the "Genetically modified food

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controversies" article in Wikipedia and scroll down to "Health," you will find a number of review articles referenced, such as those by Dr. Christopher Preston in *AgBioWorld* and one by C.K. Winter and L.K. Gallegos from the University of California. You can click on the link provided and read the articles yourself. I would welcome any suggestions readers may have on other online resources for identifying the current state – and consensus, if one exists – of scientific research on a given subject.

Next week, we will see that three current issues are at times obscured by elements of ideology by some well-intentioned environmentalists. By taking anti-scientific positions, environmentalists can end up helping the anti-environmental voices on the right.

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