

## **Constructive Dissent**

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The fact that an opinion has been widely held is no evidence whatever that it is not utterly absurd; indeed in view of the silliness of the majority of mankind, a widespread belief is more likely to be foolish than sensible.

- Bertrand Russell

There is a story about Albert Einstein that dates back to his time at Princeton. It seems the great physicist had gotten into the habit of posing the same examination questions to physics students for several years in a row. Confronted by the Dean for his apparent laziness, Einstein explained that his questions may be the same—but the answers kept changing. This story is doubtless apocryphal yet it makes the important point that science is always unfinished business. As they used to say on *The X-Files*, “The Truth is Out There” but we never quite get to it. Scientific knowledge is always provisional. The best we can hope to achieve from the advance of science is a closer and closer approximation to the truth.

Curiosity, independence of judgement and scepticism are the drivers of scientific progress, and, of the three, scepticism is the most important. As social theorist Robert Merton noted, “Most institutions demand unqualified faith; but the institution of science makes scepticism a virtue<sup>1</sup>”. Scepticism about prevailing beliefs drives scientists to devise rigorous tests, which serve to progressively deepen our understanding.

It is important to differentiate scientific scepticism from mindless doubt. Anything can be doubted no matter how much evidence exists to the contrary. The former President of South Africa, Thabo Mbeki, doubted the connection between AIDS and HIV which he

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<sup>1</sup> Merton, R. 1949. *Social Theory and Social Structure*, New York: The Free Press, p. 547.

considered to be a harmless virus<sup>2</sup>. US Presidential candidate Mike Huckabee rejected evolution<sup>3</sup> as “just another theory”. Their opinions are not examples of scientific scepticism. At best, they are a form of dogmatism, a stubborn clinging to a point-of-view while rejecting the vast preponderance of evidence. At worst, the critics of science adopt an attitude of postmodern cynicism—objective reality is an illusion, so evidence is irrelevant and one view is as good as another. Scientific scepticism is different. It embodies a special type of doubt called constructive dissent.

### Constructive Dissent

In 1968, Lord (Eric) Ashby, Vice-Chancellor of Cambridge University, delivered an address to the Association of Commonwealth Universities in Sydney<sup>4</sup>. In his speech, Ashby suggested that academics should take an “oath” similar to the classical Hippocratic Oath taken by doctors. This academic oath would describe the values and ethics of teaching and research. Among these Ashby included “the discipline of constructive dissent”.

Unlike Mbeki and Huckabee, practitioners of constructive dissent do not just oppose entrenched ideas. Using their deep knowledge of a field, careful observations and creative thought, constructive dissenters identify patterns that others miss. This is where the “constructive” part comes in. Ashby argued that for dissent to be constructive, “it must shift the state of opinion about a subject in such a way that the experts concur”. Thus, it is not enough for Thabo Mbeki to deny a connection between HIV and AIDS; to make a useful contribution to knowledge, he must also use his deep knowledge of virology, careful observations and creative thought to convince the experts to change their view. Mbeki, of course, did not have a deep knowledge of virology, he made no observations and he convinced no one to change their opinion. Thus, in Ashby’s view, Mbeki was not contributing to knowledge. He was a pseudo-sceptic who carefully selected bits of evidence to defend a preconceived position.

The road toward the truth is neither straight or smooth. Few scientists are capable of what the mathematician Henri Poincaré called “flawless reasoning<sup>5</sup>”. There are unexpected twists and turns, which is why the answers to Einstein’s questions keep changing. Still, history records thousands of examples of how constructive dissent advances our understanding: Copernicus, Galileo, Pasteur, the list of scholars who struggled against

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<sup>2</sup> Mbeki, T. Speech to 13th International Aids Conference, Durban, SA  
<http://www.virusmyth.com/aids/news/durbspmbeki.htm>

<sup>3</sup> 2008 Presidential Candidates’ Debate <http://www.youtube.com/watch?v=n-BFEhkIujA>

<sup>4</sup> Ashby, E. A. 1969 Hippocratic Oath for the Academic Profession, *Minerva*, (Autumn-Winter)

<sup>5</sup> Poincaré, H. 1905. *Science and Hypothesis*. London: Walter Scott Publishing.  
[http://www.brocku.ca/MeadProject/Poincare/Poincare\\_1905\\_toc.html](http://www.brocku.ca/MeadProject/Poincare/Poincare_1905_toc.html)

religious dogmas and intolerant monarchs is long and glorious. My favourite example, however, is more recent and much closer to home.

### *A model case*

I was formerly the Dean of Medicine at the University of Western Australia. In the 1980s, one of the pathologists at Royal Perth Hospital, Robin Warren, became interested in the unusual bacteria that he claimed to have found in the stomachs of ulcer patients. He thought that these bacteria might be responsible for at least some duodenal and gastric ulcers. Few doctors or researchers took Warren seriously because the dominant view at the time was that bacteria could not live in the stomach's acidic environment. Anyway, everyone knew that ulcers were caused by stress, spicy foods and aspirin.

One person who did take Warren seriously was a doctor in training, Barry Marshall. Barry came from a working class family and lived for a while in a house with a dirt floor and outdoor toilet. He supported himself through medical school by harvesting wheat. Perhaps because he was not exactly an establishment figure himself, Marshall was drawn to Warren's iconoclastic work. He and Warren tried several times to culture the stomach bacteria in the laboratory (so that they could study it) but without success. Then, by a happy accident, the cultures were left to grow for longer than usual when everyone took an Easter break and forgot to wash the petri dishes. When they returned after Easter, Marshall and Warren found the bacteria happily multiplying.

They identified the bacteria as a genus called *helicobacter pylori*. Warren and Marshall believed that *helicobacter* was responsible for some, perhaps most, ulcers, but practically no one else agreed. Marshall thought he could sway expert opinion by showing a direct connection between the the presence of the bacteria and gastric disease. So he decided to swallow a solution containing the bacteria. About a week later, he developed a serious case of gastritis.

Even this dramatic demonstration failed to move medical opinion, at least not right away. Entrenched beliefs are not easy to change. Doctors do not like admitting they were wrong and there were many vested interests. For example, antacid medications, the most common treatment for ulcers, were highly profitable products for pharmaceutical companies. To protect their market, drug company representatives spent considerable time and money finding flaws in Marshall and Warren's work. They argued strongly for the continuation of antacid treatments (which remain big sellers even today). It took another 10 years before the National Institutes of Health in the USA agreed that eliminating *helicobacter pylori* would cure many types of ulcers. In 2005, Marshall and Warren were

awarded the Nobel Prize in Medicine for their contribution to science and to the alleviation of human suffering.

The story of helicobacter pylori illustrates the power of constructive dissent but it also highlights another important point about science. All great discoveries begin as blasphemies, which are resisted by those with something to lose.

### **Pathological Science**

Science is an enterprise to which people bring not only their intellectual strengths but also the entire panoply of human flaws including ego, striving for fame and money, self-deception, vanity and greed. Anthropologist Marshall Sahlins summarised the process succinctly as “the pursuit of disinterested knowledge by self-interested people<sup>6</sup>”.

As members of the Mont Pelerin Society all know, there is nothing wrong with enlightened self-interest. It works well for the economy and it usually works well for science too. Competition means that good science eventually transcends the human imperfections of even its most flawed practitioners. What is troubling is not that scientists are human but rather how little we seem to learn from history. We appear condemned to endlessly repeat the same mistakes. The problem is that people tend, again in Poincaré’s words, to either “doubt everything or believe everything” when what is really needed is greater reflection.

In judging science, we need particularly to watch out for two all-too-human traits: self-delusion and the selective use of data.

#### *Self-Delusion*

René Blondlot<sup>7</sup> was a turn-of-the-20<sup>th</sup>-century French physicist who claimed to have discovered a new type of radiation. Blondlot called his discover the N-ray, after the city of Nancy where he lived. The attitude of constructive dissent ensured that Blondlot’s claim was subject to independent replication. This proved to present no problem. Many other French scientists confirmed his observations. Alas, physicists in other countries were having difficulty seeing N-rays. When the scientific journal *Nature* sent an American scientist to France to settle question, it soon became clear that there was no such thing as an N-ray. Blondlot was not a deliberate fraud; he was deceived by his very human wish to be

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<sup>6</sup>Sahlins, M. (2008). The conflicts of the faculty. *Anthropology News*, 49 (1).

<sup>7</sup> Blondlot, R. (1905). *N-Rays*. London: Longman Green.

[http://books.google.com.au/books?id=Jpg3AAAAMAAJ&q=Ren%C3%A9+Blondlot&dq=Ren%C3%A9+Blondlot&source=bl&ots=cHtFSFM21R&sig=W1j425uCE3DUYIjEQJ3K\\_uVAMZU&hl=en&ei=ypljTL-5L4mKvQP02rWfCg&sa=X&oi=book\\_result&ct=result&resnum=5&ved=0CCoQ6AEwBA](http://books.google.com.au/books?id=Jpg3AAAAMAAJ&q=Ren%C3%A9+Blondlot&dq=Ren%C3%A9+Blondlot&source=bl&ots=cHtFSFM21R&sig=W1j425uCE3DUYIjEQJ3K_uVAMZU&hl=en&ei=ypljTL-5L4mKvQP02rWfCg&sa=X&oi=book_result&ct=result&resnum=5&ved=0CCoQ6AEwBA)

well-regarded. Ironically, the more famous Blondlot became, the easier it became for other French physicists to confirm his findings. Blondlot's self-delusion became contagious.

In this case, the scientific process weeded out a false claim but human nature is hard to change and, as already noted, some lessons have to be learned over and over again.

On the third of March 1989, the University of Utah in Salt Lake City held a press conference to announce that two faculty chemists, Stanley Pons and Martin Fleischmann had discovered a non-polluting source of energy which they called "cold fusion"<sup>8</sup>. The story was leaked by the university to *The Wall Street Journal*, which splashed it across the front page and followed it up over the succeeding weeks. The claim was big news because of its promise of an endless supply of cheap and clean energy. Moreover, Pons was a well-published scientist and Fleischmann was a Fellow of the Royal Society, so their work had to be taken seriously.

Curiously, for such establishment figures, Pons and Fleischmann flouted the usual scientific conventions. They went directly to the media without making the details of their work available to other scientists for replication. Physicists were forced to guess about the details of the Pons and Fleischmann experiment so they could repeat it. When preliminary results started to come in, they were mostly negative. Pons and Fleischmann explained these results away: the researchers used the wrong techniques or materials, they did not wait long enough, their methods were sloppy.

The Utah legislature appropriated \$5 million for the university to commercialise this great new discovery. The US defense department wanted to examine whether cold fusion could power missiles. A group of Utah Mormons thanked God for helping to rescue the university from serious economic problems. Orchestrated by public relations consultants hired by the university, a congressional hearing was held in Washington to laud the discovery and appropriate even more money so that America could commercialise the technology "before the Japanese" (which seems a rather quaint fear today).

Needless to say, nothing came of any of this. The entire episode was the creation of a sensationalist media, a desperate university and gullible politicians. Incredibly, although no new evidence has been presented over the last 20 years to show that cold fusion exists, Pons and Fleischmann still believe it does. This is not all that surprising. Blondlot went to his grave still believing in N-Rays. Self-deception is difficult to dislodge. One way it continues is by the tendency to focus only on data that confirm one's prior beliefs.

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<sup>8</sup> See Park, R.L. 2000. *Voodoo Science*. Oxford: Oxford University Press.

### *Selective use of data*

According to Richard Wilkinson and Kate Pickett's 2009 book, *The Spirit Level*<sup>9</sup>, income inequality increases crime and infant mortality, makes people fat, lowers life expectancy and reduces education outcomes. Their book contains a large number of statistics to back up this claim. According to the authors, the cure for all of these ills is to reduce income and wealth inequality. They argue that everyone, even those who stand to lose money from income redistribution, will be happier, safer and healthier.

Wilkinson and Pickett's hypothesis relies on correlations, which every statistics student knows does not imply causation. By what mechanism does inequality produce its negative effects? According to the authors, the mechanism is the "stresses of social status differentiation". In other words, obesity, crime and illness are the result of the "stress" produced by envying those who are richer and higher on the social ladder, working too hard to catch up with them and fearing the consequences of slipping further down the social ladder. The way to eliminate this "stress" is to equalise wealth.

Here is a prediction that flows directly from this hypothesis. If Bill Gates, Warren Buffet, Rupert Murdoch and their friends took their billions and emigrated from the USA to Australia, Americans would automatically become healthier, happier and thinner while Australians would become grumpier, fatter and more prone to crime. A minute's thought would show this to be highly dubious, but a minute is a long time and thought is hard. *The Spirit Level* has been uncritically received by left-wing politicians who see it as a rationale for the redistribution policies to which they have always been committed.

So, if the hypothesis seems a bit far-fetched how do we account for Wilkinson and Pickett's correlations? It turns out that there is a simple explanation. They chose, from among all the many possibilities, those countries and numbers that fit their preferred hypothesis. In a report published by the think tank, Policy Exchange, Peter Saunders<sup>10</sup> criticises their selective use of data:

The statistical analysis in *The Spirit Level* is heavily flawed. There are many instances where graphs are presented in which just one or two extreme cases are used to support unwarranted generalisations. For example, the claim that there is an association between a country's homicide rate and its level of income inequality depends entirely on the high murder rate in the USA (which

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<sup>9</sup> Wilkinson, R. & Pickett, K. 2009. *The Spirit Level*. Penguin.

<sup>10</sup> Saunders, P. and Evans, N (editor). 2010. *Beware False Prophets: Equality, the Good Society and The Spirit Level*. London: Policy Exchange.

probably has more to do with its gun control laws than its income distribution). Across the other 22 countries, there is no association between income distribution and murder rates.

Similarly, the claim that average life expectancy is linked to income inequality rests entirely on the longevity of people in Japan (which probably has something to do with their diet, genes or a mixture of the two). Take Japan out of the analysis, and the apparent association with income inequality again collapses. (p. 7)

Saunders created a “social misery index” which includes such statistics as suicide rate, racial discrimination, and alcohol abuse to show that the selective use of data can produce any result that researchers wish to find. By “cherry picking” from the available data, Saunders managed to show that unequal societies had better social outcomes than more egalitarian ones, just the opposite of Wilkinson and Pickett’s conclusion. Another critic, Christopher Snowden<sup>11</sup>, has shown that when all countries are included in the analysis, distance from the equator or the first letter in a country’s name are better predictors of educational outcome than income inequality.

Wilkinson and Pickett deny selecting their data to prove their point but it sometimes appears that way. For example, to maintain the consistency of their argument that income inequality is inherently bad, they present data purporting to show that the USA is no more innovative a society than is Portugal. Given that the USA is home to Harvard, Silicon Valley and Hollywood, is this a conclusion that anyone, other than those seeking a particular outcome, would believe?

The authors have responded robustly to their critics,<sup>12</sup> applying the same criticism leveled at them—selecting data to make a point. This debate is likely to rage for a while because it concerns important issues of politics and ideology, which are not easily amenable to scientific proof or disproof.

Wilkinson and Pickett and their critics know that their respective arguments and data will be carefully studied by those on the other side, so they are motivated to take care. Assuming everyone involved adheres to the doctrine of constructive dissent, the result should be a better understanding of what effect, if any, inequality has on the health and happiness.

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<sup>11</sup> Snowden, C. 2010. *The Spirit Level Delusion: Fact-checking the Left’s New Theory of Everything*. Democracy Institute: London.

<sup>12</sup> See: <http://www.equalitytrust.org.uk/resources/response-to-questions>

## A 21st Century Enlightenment

Constructive dissent is simply another way of describing some of the cardinal virtues of the enlightenment: rationality, reason and empiricism. These virtues are always under threat. Consider Prince Charles's recent remarks:<sup>13</sup>

It might be time to think again and review it [the Enlightenment] and question whether it is really effective in today's conditions, faced as we are with huge challenges all over the world. It must be apparent to people deep down that we have to do something about it.

We cannot go on like this, just imagining that the principles of the Enlightenment still apply now. I don't believe they do. But if you challenge people who hold the Enlightenment as the ultimate answer to everything, you do really upset them.

Acknowledging that his views did not always fit with the mainstream, Prince Charles said: "It is very difficult to challenge and overcome current conventional ways of looking at the world."

Charles' views are shared by others, which underlines the need to continue our defense of Enlightenment values. Constructive dissent is a mindset, a way of understanding the universe and our place in it. By itself, it will not solve all of our economic, health and social problems but it provides an objective way to collect facts, assess them, test hypothesis and ensure an intelligent debate. Like Einstein, those who practice constructive dissent accept uncertainty and recognise the provisional nature of our understanding. Most of all, constructive dissent is a form of optimism because its practitioners believe that, with deeper understanding, the future can be better than the past—and what could be more optimistic than that?

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<sup>13</sup> Low, V. 2010. Prince Charles declares war on... the Enlightenment. *The Times*, Feb 4. <http://www.timesonline.co.uk/tol/news/uk/article7013764.ece>