Selling science: the lure of the dark side

THE STATE OF SCIENCE: Has prolonged scrutiny of climate science revealed more about the way science works than scientists themselves might like? Matthew Bailes thinks so.

Although often ignorant of the details, the general public marvel at the genius of intellectual giants such as Einstein and the purity of his scientific endeavours.

Einstein’s peer-reviewed work was quick to bring him world-wide acclaim, a Nobel prize by 1921, and ensured his name would be forever synonymous with genius.

He was also Jewish, and in 1931 a German book – 100 Authors Against Einstein – was published, written by many professors of the day, mainly criticising relativity.

Time has shown that all 100 were wrong and that the book was propaganda. Many of the 100 were just bad scientists; some had opposing theories; many were commenting on a topic outside their own areas of expertise; and some probably possessed ulterior racist motives. But the lesson here is that it’s possible to find 100 experts to criticise what is a valid scientific theory.

Modern experimental science

Modern experimental science often requires assembling large teams and expensive infrastructure, and that requires political lobbying. Research empires are built upon grants that demand the marketing of ideas, outstanding track records and scientific publicity.

For some scientists the publish/publicise/grant cycle becomes intoxicating, leading to an exponential increase in the dimension of their empire, but also a temptation to engage in unethical behaviour. Some falter.

When exposed, all of science loses credibility, and rightfully becomes vulnerable to attack.

Big prizes and scientific downfall

The biggest breakthroughs (and hence prizes) in science often involve radical paradigm shifts and vehement scientific debates. It is a high-stakes game.

As in a high-profile medieval trial, leading scientists often act as defenders of the faith or heretics. Ideally the evidence is judged and community consensus dictates the winner. This process advances science. If conducted appropriately, both combatants are ultimately respected for their roles.

Unfortunately, the losers sometimes refuse to acknowledge their victors. Bizarrely, they start to only see the evidence in support of their own theory and become completely oblivious to the truth.

It is almost as if their theory is inseparable from their own feeling of self-worth, and to acknowledge their error would negate all the positive contributions they made to the earlier debate. These scientists often become strange recluses who congregate with others who have also failed.

They start to see conspiracies where none exist; some even create their own journals, write non-peer-reviewed articles and books and rebel against the scientific establishment.

The lack of peer review removes any checks on their evidence and they lose all scientific perspective. Their writings become propaganda. When recruits are needed to attack any consensus view in science, they are eager volunteers ready for revenge.
The current consensus view of climate scientists is that rising CO₂ levels due to man-made activity are leading to a change in global temperature that, if left unchecked, could be catastrophic.

We know the planet’s climate changed before mankind could have had significant effect upon it from historical temperature records that show ice ages as well as warmer periods.

So the question is not whether the climate changes or not, but whether the current changes are both significant and being caused by mankind.

Extrapolations of climate models are “model-dependent”, because they, like the earth, are so complicated, yielding a range of potential impacts upon our future.

The Intergovernmental Panel on Climate Change (IPCC) was the United Nation’s response to the potential climate crisis.

Unfortunately there are few parallel organisations in other areas of science and scientists love to challenge each other’s theories and data. They often fiercely resist documents meant to represent the view of the entire community and bristle against being told what they are collectively saying. As a result some legitimately feel the need to disengage and protest.

Conspiracy theorists believe climate scientists have yielded to the temptation of the “dark side” and are vastly exaggerating the effects of climate change to bolster themselves, their empires, and their own importance, thus invalidating any evidence that man-made global warming is real.

The increased scrutiny of climate science has revealed more about the way science works than scientists themselves might like. All scientists compete for funding, and the more compelling the evidence and story, the greater the chance of success.

It would be unthinkable that climate scientists would not, at least subconsciously, be using the potential catastrophic consequences of global warming to maximise their funding.

But scientific heroism is ultimately found in revealing the truth.

The professional motivation for most scientists is to make positive contributions that they are recognised for by their peers. If there was some glaring error or conspiracy in temperature measurements, climate models and CO₂ levels, there is ample opportunity for glory by revealing it in peer-reviewed journals.

To deny the truth ultimately makes you look stupid, and it becomes more and more obvious as time goes by, as instrumentation improves, computers get faster, and more of your peers check your results. For most scientists, ultimately their reputation is everything.

Instant experts

Bad scientific practice doesn’t equate to peer-reviewed evidence. The idea that non-specialists, like retired engineers or lawyers, can waltz into any field, be it astronomy or climate change, make a few quick back of the envelope calculations or statistically-flawed deductions and “prove” the opposite of what experts with well-funded teams are repeatedly demonstrating is comical.

The “dark side” applies and appeals to people on both sides of the climate change debate. Writing up some bad science that gets fan-mail from laymen, some prominent failed scientists or publicity from journalists with a cynical or sceptical bent, can be just as addictive as those trapped in the more mainstream scientists’ publish/fame/grant cycle.

It is nice to have people saying you are very clever and to appear in the media, so why not do some more “research”? But oh dear, what if it shows your earlier claims were wrong?
Luckily if you are ignorant enough you can do some more bad science and find the two-sigma result you were looking for.

Can you get these findings published or peer-reviewed by an unbiased and anonymous referee? Probably not. But who needs conventional recognition of your work when a journalist or climate-denial blog will give you the attention you crave?

After all, the climate change conspiracy would have ensured your paper got rejected from any of the established peer-reviewed journals. Right?

The Risks

In the 1950s, long before climate change was fashionable, scientists at Mauna Loa were measuring CO₂ levels. They saw an annual cycle, and noted CO₂ levels were rising every year.

[Graph showing atmospheric CO₂ levels at Mauna Loa Observatory]

They are still rising. In fact, CO₂ has increased by about 20% in about 50 years at ever-increasing rates. It is an alarming statistic. Is the fact this coincides with a large increase in the rate of burning of fossil fuels by humans just a coincidence? Probably not.

Whether global warming is being caused by our changing CO₂ levels is a very complicated question. My own view is that changing the chemical composition of the atmosphere is a dangerous thing to do.

I’d prefer to err on the side of caution and work to return it to lower levels for the same reason I want the number of fish in the ocean to be roughly constant.

Remember the Ozone Layer Hole?

People often forget that we avoided a near catastrophe when atmospheric scientists correctly identified that man-made emissions of a different type (fluorocarbons) were creating a hole in the ozone layer. Fortunately the change to our daily lives by eliminating their use was minimal. Or was that a conspiracy too?
Hey, aren’t these the same scientists who are telling us CO₂ levels and temperatures are rising?

It only seems to be those theories that cause us to change our lifestyle or question our religious beliefs that suffer the wrath of the new breed of “sceptics” or “cynics”.

**Evolution** and climate change fall into this category, as does the branch of astronomy that describes the **true age of the universe**, as opposed to what’s in the Bible.

Good scientists are sceptical, but they apply tests and models in an unbiased way and are judged by their peers, not politicians or the media.

The consensus view of modern science is rarely at fault in the long-run, regardless of the temptations for scientists of any discipline to sell their ideas.

If there is a lesson to be learnt from all this it’s the following: ultimately we as scientists will only be respected if we conduct ourselves appropriately. People engaging in unethical conduct should be punished severely. Lessons on ethics should not be confined to those involved in human experimentation, but extended to all scientists involved in research.

This will ultimately help increase people’s respect for science so practitioners can continue to deliver the many advances that enhance our quality of life.

Science doesn’t advance by people congregating with pre-conceived ideas determined to reveal “the truth”. It advances by unbiased approaches and competition for funding based upon track records, research plans and peer-reviewed evidence.

Without peer review we end up with propaganda, similar to that which condemned Einstein’s theories in the 1930s.

This is the thirteenth part of The State of Science. To read the other instalments, follow the links below.

- **Part One:** Does Australia care about science?
- **Part Two:** What’s a scientist – a poker or a puffin?
- **Part Three:** Science can seem like madness, but there’s always a method
- **Part Four:** Express yourself, scientists – speaking plainly isn’t beneath you
- **Part Five:** Science is imperfect – you can be certain of that
- **Part Six:** Why do people reject science? Here’s why …
- **Part Seven:** When things don’t add up: statistics, maths and scientific fraud
- **Part Eight:** Get real: taking science to the next generation of Einsteins
- **Part Nine:** Critically important: the need for self-criticism in science
- **Part Ten:** Please, sirs, can we have some more? Aussie scientists need fuel, not gruel
- **Part Eleven:** Scientists and politicians – the same but different?
- **Part Twelve:** Tweed or speed … a day in the life of a modern scientist
- **Part Thirteen:** Selling science: the lure of the dark side
- **Part Fourteen:** Way off balance: science and the mainstream media