

## Empowering informed voices

Nicola Gaston\*

New Zealand Association of Scientists, P O Box 1874, Wellington

The issue of scientists speaking out, or going public, is one that has become increasingly present – even urgent, perhaps – in the 18 months since I became President of the New Zealand Association of Scientists (NZAS). The impetus for this conference (1) can be traced back to the survey (2) by NZAS in October last year, asking scientists to share their experiences and concerns about their ability to speak out. Our reasons for doing so were manifold.

Firstly, we had had our attention drawn to a statement in the draft ‘Nation of Curious Minds’ document (3), which suggested that a Code of Practice for Public Engagement for scientists would be drawn up by the Royal Society of New Zealand (RSNZ) (4) to prevent scientists from apparently dangerous levels of advocacy (5).

In addition, the attention of the NZAS had previously been drawn to the issue of scientists speaking out, and the constraints surrounding such occasions, by several earlier occurrences. The Ruataniwha irrigation project, on which letters were sent to the RSNZ (6) to question the conduct of scientists employed as expert witnesses in that case, had already led to a suggestion being presented at Council that perhaps we could advocate for Crown research institutes (CRIs) to be required to sign up to the RSNZ Code of Professional Practice and Ethics – a measure which, it was felt, might afford some protection for both the CRIs themselves, and for scientists, when such public disagreements happen. When the draft National Statement of Science Investment (7) was presented for public submission (8), the NZAS included this suggestion in our list of recommendations (9).

A third stimulus for our thinking about these matters came from the survey that we did in August last year, asking for comment from the scientific community on their experiences with the National Science Challenges (NSC). This was motivated by reports in the media of several complaints about the NSC processes, which were uncovered by an Official Information Act request from the media. This was our ‘ironic’ survey, to

quote the Minister for Science and Innovation, the Hon Steven Joyce (10), who found it ironic that the Association of Scientists would conduct such an unscientific survey as one can manage in five minutes using Survey Monkey. The true irony, of course, is in this dismissal of the 280 responses that we received in the three days in which the survey was open, as it was explicitly motivated by our concerns about the level of selection bias apparent in the dismissal by the Minister of the 19 letters he had received over 8 months (11) as not indicative of a high level of concern. Apparently not all scientists are prepared to write a letter to the Minister.

This emphasises that there are a number of different issues embedded within the conference topic, of scientists going public, and it is important to try to disentangle them and name the problem that we are discussing as directly as we can. Are we talking about what is most usually referred to as science communication, which might be distinguished as scientists addressing the public directly? Or are we talking about scientists informing policy, and their need to be heard by those in the corridors of power? Depending on which of those questions you keep in mind, the players, their motivations, and the pressures or other concerns that they have, are necessarily different.

This is an issue that reverberates well beyond what we might think of, in a limited sense, as science. The intersection of evidence with policy, and with politics, is an uneasy one. We will hear in this conference about recent work done in surveying the experiences of non-governmental organisations (NGOs) (12), and the difficulties that they have in speaking truth to those in power.

### Power

To my mind, this gets to the heart of the matter: because the power dynamics in these two different scenarios – despite the fact that they are often a little mixed – are very different. If we want to ensure that the voices that are heard are those that most need to be heard, then a consideration of power, and of

\*Correspondence: [nicola.gaston@vuw.ac.nz](mailto:nicola.gaston@vuw.ac.nz)



**Dr Nicola Gaston** teaches in the School of Chemical and Physical Sciences at Victoria University of Wellington. Her research aims to improve our understanding of the functionality of materials, through studying the development and variation of physical properties as a function of size, from simple clusters of a few atoms, to large nanoparticles and bulk materials, using accurate quantum mechanical calculations and highly parallel computing. She completed her BA and BSc(Hons) at the University of Auckland, and a PhD at Massey University, followed by a postdoctoral fellowship at the Max Planck Institute for the Physics of Complex Systems, in Dresden. She returned to New Zealand in 2007 to take up a Foundation for Research, Science and Technology NZS&T postdoctoral position at Industrial Research Limited, where she remained until 2012, finally as Principal Research Scientist. She has been a Principal Investigator in the MacDiarmid Institute for Advanced Materials and Nanotechnology since 2010, and was previously leader of the Electronic and Optical Materials theme of the MacDiarmid Institute and a member of the Science Executive. Nicola is the current President of the New Zealand Association of Scientists.

---

those whose voices are already privileged in either the public or political arenas, seems to be an important thing to keep in mind.

So the reason that I've called this talk 'Empowering informed voices' is that it is the closest I could come to summarising the interest of the NZAS in this discussion, in supporting individuals who are best placed to support and share the science. Understanding the balance of power, especially in creating barriers for those individuals, is critical to the conversation we are having.

## Selection bias

I've already referred to selection bias, in the context of considering just who in the New Zealand science system is likely to send Minister Joyce an email outlining concerns about the National Science Challenges. We should also be concerned about selection bias in decisions about what science we fund, what questions we ask as scientists, and therefore what scientific results are obtained. Just as real is my own selection bias, in the examples I can provide you with based on my own experiences, so I will attempt to put some broader context around the issues that we are dealing with. This takes me well beyond my own areas of expertise, but if we want to minimise selection bias in determining who gets to speak about their scientific expertise in the public arena, perhaps we have to be prepared, sometimes, to step beyond our own comfort zone.

The pushback we are seeing in New Zealand against scientific expertise is, still, only the tip of the iceberg. In November last year, bills were passed through the US House of Representatives which restrict scientists from providing expert advice (13) to the Environmental Protection Authority on the basis that as experts, they have a conflict of interest on the subject matter. The White House issued a statement (14) saying the new membership requirements for the Science Advisory Boards 'could preclude the nomination of scientists with significant expertise in their fields', in favour of scientists with industry expertise. Scientists funded by the public, in this scenario, are seen as having greater conflicts of interest than researchers paid for by oil companies or other such organisations.

This is troubling. In Canada, the restrictions on the ability of government-funded scientists to speak out publicly (15) far outstrip any direct constraints on CRI scientists in New Zealand. In fact, a year ago, in a discussion of the ability of scientists to speak out, the obvious thing to do was to point to Canada as evidence of where the slippery slope might take us: suddenly it seems that we are spoilt for choice.

## Official authorisation

Very recently, three new sentences were added to the civil service code in the UK (16). These read:

*All contacts with the media should be authorised in advance by the relevant Minister unless a specific delegation or dispensation has been agreed which may be for blocks of posts or areas of activities. The Civil Service Code (17) applies to all such contacts. Civil Servants must at all times observe discretion and express comment with moderation, avoiding personal attacks.*

There are serious concerns, which have been well expressed by the Science Media Centre in the UK (18), that the turn-around times required for such approval to be granted will simply preclude comment to the media on matters of public interest

in a timely fashion. The institutions affected by these changes are quite diverse: from the Met Office, to the National Institute for Biological Standards and Control, to the Air Accidents Investigation Branch of the Department for Transport. These all seem to be agencies which are likely to host expertise relevant to matters of public interest – indeed, one might suspect that the presence of such expertise is a pre-requisite for a publicly funded science organisation.

Despite the rather draconian measures taken by governments around the world in seeming fear of what their scientists might say, we might want to stop, and consider, and decide that, so long as there are no restrictions on what our academic scientists can say and we have a functioning version of academic freedom, perhaps, we don't need to worry.

However, the results of the survey NZAS conducted in October last year (19), in combination with many reports from other places, such as a recent article in *The Chronicle of Higher Education*, entitled 'The dangerous silence of academic researchers' (20), seem to indicate that explicit restrictions on scientists speaking out are of lesser importance than a culture of fear and peer pressure, which may do more damage in the long run, and is certainly not excluded from our universities.

## Advocate or 'honest broker'

So where do such concerns come from? Fear of criticism, or fear of public attack?

Attacks on scientists are often couched in particular terms. The concept of an advocate, as a person with an inherent conflict of interest (21), seems to be central to these kinds of conversations. Advocacy is a dirty word, it seems, though it is not often explained why.

One person who has made more of an attempt than most to outline the differences between scientific advice, and advocacy, is Roger Pielke (22). In his book, *The Honest Broker*, he distinguishes 'issue advocates' from 'science advisors'. This distinction is naturally crucial for someone such as the Prime Minister's Chief Science Advisor, as he aims to retain a position from which he can provide – and be seen to provide – unbiased advice on scientific issues. However, for the average scientist, this discussion, with its inherent criticism of the advocate, is something of a red herring. Its use is often based on a critical fallacy in our understanding of science: the idea that an individual scientist, through training and acquired expertise, is able to become more objective than the average person, and thus attain the status of an 'honest broker'.

In reality, the situation is much more complex (23). It is an attractive fallacy, and one that it is hard to refrain from leaning on in the teaching of science: the myth of the great individual – the giants on whose shoulders Newton managed to climb – is attractive as it enables us to frame scientific advancements in terms of the achievements of a single individual, at a particular moment in time: Archimedes in the bath, shouting 'Eureka'; Newton under his apple tree, or poking around in his own eye with his bodkin; Rutherford and his gold foil experiment. There is an element of truth in these stories, but there is also a lot of falsehood, by omission. As scientists, we know that scientific knowledge advances in the kind of uneven leaps and bounds that you expect from participants in a three-legged race. In this race, we are tied to each other by the requirements of reproducibili-

ty: a team effort, and peer review, is needed before significant progress in science can be declared.

The objectivity that we aspire to, as scientists, therefore, is based in teamwork. In cooperation, competition, collaboration and contest; reproducibility, falsification, and peer review. To admit our biases, of selection, or of confirmation, does not make us worse scientists. In fact, the acknowledgement of one's own biases seems, according to some studies (24), to be an essential prerequisite for the exercise of unbiased judgement. Thus I'd make the case that essential companion reading for *The Honest Broker is Thinking, Fast and Slow* – Daniel Kahneman's assessment of how our minds deceive and mislead us.

## Political criticism

Another recent event in the USA – perhaps a salutary lesson to us – has arisen from the intersection of politics and science there, in the context of climate change. Climate scientists have previously been subject to interference from the right of the political spectrum (e.g. the Attorney General of Virginia's 2010 investigation of the research behind the 'hockey-stick' graph of climate change, under the Virginia Fraud Against Taxpayers Act); it is a relatively recent development (25) that now sees democratic senators digging into the funding of scientists (26) who have published work critical of some work on climate change, among them Roger Pielke himself.

The point here is not the subject of climate change. It is the construction of a political climate in which the motivations of individuals are endlessly queried and one is set up in opposition to another, which is the exact opposite of an environment in which scientific enquiry is valued and nurtured. Such tactics hollow out the reasonable middle ground, which, while it may not produce the stuff of headlines in *Scientific American*, is an important place in which reproduction of results, rebuttal, re-consideration, and refinements of interpretation may be carried out. Losing this reasonable middle ground damages science.

The conversation that needs to be had in parallel to any conversation about the prerequisites for good science to happen is to describe the reasons why we value scientific enquiry in the first place. This is not an easy conversation to have in a room full of scientists, where the attitude can often be that, 'Of course' science makes the world better, and therefore: 'Can we please move on to discussing how we do that?' It is, however, an important prerequisite for our argument for more freedom to speak out, that we understand what it is about science that we take for granted..

## Disempowerment

I gave my talk the title 'empowering informed voices' for more than one reason. It encapsulates the goals of the NZAS (27), in which it is written that we will defend, promote, and champion scientific ideals and the general status of science in society. The term 'empowerment' reflects the extent to which the discussion is about power and privilege, although privilege itself is usually reducible to a difference in power.

Examples of the kinds of uses of power that can prevent scientists from going public were given in the survey NZAS ran last year.

### On power

*University staff may be free to talk but that privilege is now almost unique to them.*

*I believe that government influencing standards for science communication undermines the credibility of scientists, and opens up risk for manipulation of science for political gain.*

### On vested interests, and job security

*I am already pressured by my employer to resist speaking to media unless our comms department have approved statements. This is going to enshrine into law a dubious practice already undertaken by some institutions.*

*How as a CRI scientist can I ever speak out against an industry that my CRI serves? I just cannot.*

### On funding pressures

*We rely on Ministry of Health funding and we believe advocating for better public health responses would jeopardise this essential income stream, as our area of work is not currently a Govt priority and consequently would be easy to cut.*

I won't say that the effect of these constraints on scientific quality is of greater importance than the effects on individuals, but it is clear that they go hand in hand:

*I have seen colleagues who have been strongly asked to change the outcome of their reports. And who have been bullied by more senior members of staff over a controversial issue. I have also seen work prevented on a controversial issue, because the political outcome would be potentially damning.*

The concerns that have been raised with the NZAS are that the fears that scientists have are not primarily due to any changes that might be made to the Code of Professional Standards and Ethics of the RSNZ. The reasons that scientists feel unable to speak out go much deeper, and can be summarised more simply as due to an imbalance of power.

Disempowerment comes in several forms: Political power, through instruments of funding in particular; direct financial power in the form of commercial interests; the kind of reputational risk that going public attracts simply because you know that what you say will be unpopular, and that can lead to ad hominem attacks and name calling.

The fear of being wrong is bad enough on its own. But it is much worse when compounded by the myth of scientific expertise, in which an expert is expected to be right all the time, rather than a simple purveyor of knowledge, however partial.

## Misuse of academic status

There is another kind of power at work in the domain of science communication, namely one that privileges the voices of scientists. We need to acknowledge the kinds of power scientists' voices already have.

How often does the media pick up quotes on a particular issue, and sign them off with the word, 'professor' – a professor says this, or says that? The media story may not frame that statement as true, but rather as being worth reporting because of the status of the person involved, with the underlying subtext being that, 'We know those people in their ivory towers aren't right all the time'.

The misuse of academic status as a proxy for expertise on a particular question of public interest, is an exercise of power. It is at its most blatant when it happens along the lines of, 'Trust me, I'm a scientist' and at its most useful when the scientist involved is willing to explain the science. There is always a

power dynamic in any form of science communication, and understanding that has to be a prerequisite to doing it well.

We have enormous privilege. We are all a sum of experiences, some of which have privileged us as individuals and some of which have not, but in the community of scientists we have all benefited from an extended education, and for most of us, that education has been in a subject in which we had almost complete freedom of choice, and in which afterwards we have been able to select the questions we have felt most needed to be answered.

We have expertise, and in and of itself it is no more than any other form of human expertise: the ability to drive a forklift, to care for the aged, to teach arithmetic to young children who live in a world in which it is cool to not be able to do maths. Does the fact that our expertise is transferable to questions of public interest mean that it needs to be privileged? I would say yes. But do our voices always need to be privileged? To this I would say no.

## Conclusion

So to all scientists who feel a need to be supported to speak out, I affirm that the NZAS recognises that need. However, I think we need to be cautious about supporting any move towards a world in which the megaphones are evangelically pointed in all directions, or, indeed, a world in which the megaphones are reserved for a select few. We need ways to hear from the right people at the right times. Moreover, we have to be prepared to let those voices change. This is why the conversation that needs to be had, needs to encompass mechanisms, support systems, processes, and institutions such as the Science Media Centre (28) at the RSNZ, rather than becoming a conversation centred on specific scientists. I think that may be the central challenge, even, in today's conversation.

Scientific objectivity is based on teamwork; good science communication should also be based on teamwork. Such a model, rather than one that privileges specific and constant voices, is one that I would like to see us move towards.

## References

All links accessed 12 April 2015

1. <http://scientists.org.nz/news/2015/02/going-public-scientists-speaking-out-on-difficult-issues-sold-out>
2. <http://scientists.org.nz/blog/2014/survey-on-the-proposed-code-of-public-engagement>
3. <http://www.msi.govt.nz/assets/MSI/Update-me/Science-in-society-project/science-in-society-plan.pdf>
4. <http://www.radionz.co.nz/news/national/255991/fears-proposed-code-could-gag-science>
5. <http://www.radionz.co.nz/national/programmes/morningreport/audio/20151859/scientists-fear-they-could-be-gagged-if-new-code-gets-green-light>
6. <http://sciblogs.co.nz/griffins-gadgets/2014/06/12/is-cri-science-being-twisted-to-commercial-ends/>
7. <http://www.msi.govt.nz/update-me/major-projects/national-statement-of-science-investment/>
8. <http://scientists.org.nz/blog/2014/national-statement-of-science-investment>
9. <http://scientists.org.nz/posts/2014/08/nzas-submission-on-the-draft-national-statement-of-science-investment#attachments>
10. <http://www.radionz.co.nz/news/national/251457/surveyed-scientists-criticise-challenges>
11. <http://www.radionz.co.nz/news/national/250769/government-defends-science-challenges>
12. <http://www.radionz.co.nz/national/programmes/sunday/audio/2553966/sandra-grey-dissent-and-democracy>
13. <http://news.sciencemag.org/environment/2014/11/environmentalists-scientists-fret-over-republican-bills-targeting-epa-science>
14. <https://www.whitehouse.gov/sites/default/files/omb/legislative/sap/113/saphr1422r20141117.pdf>
15. <http://www.cbc.ca/news/technology/federal-scientists-muzzled-by-media-policies-report-suggests-1.2791650>
16. <http://www.theguardian.com/science/2015/mar/27/francis-maude-warned-by-scientists-over-chilling-effect-of-new-media-rules>
17. <https://www.gov.uk/government/publications/civil-service-code-of-the-civil-service-code>
18. <http://news.sciencemag.org/europe/2015/03/u-k-government-scientists-hit-media-restrictions>
19. <http://scientists.org.nz/blog/2014/survey-on-the-proposed-code-of-public-engagement>
20. <http://chronicle.com/article/The-Dangerous-Silence-of/190251/>
21. <http://www.radionz.co.nz/news/national/255991/fears-proposed-code-could-gag-science>
22. [http://en.wikipedia.org/wiki/Roger\\_A.\\_Pielke,\\_Jr](http://en.wikipedia.org/wiki/Roger_A._Pielke,_Jr)
23. <http://www.globalscienceadvice.org/conference-news/the-limits-of-being-an-honest-broker/>
24. <http://www.ncbi.nlm.nih.gov/pubmed/15943674>
25. [http://www.dailycamera.com/cu-news/ci\\_27593340/cu-boulders-roger-pielke-jr-says-congressman-is](http://www.dailycamera.com/cu-news/ci_27593340/cu-boulders-roger-pielke-jr-says-congressman-is)
26. [http://democrats.naturalresources.house.gov/sites/democrats.naturalresources.house.gov/files/Roger\\_Pielke%2C\\_Colorado.pdf](http://democrats.naturalresources.house.gov/sites/democrats.naturalresources.house.gov/files/Roger_Pielke%2C_Colorado.pdf)
27. [http://scientists.org.nz/files/page/2010/07/NZAS\\_RULES.pdf](http://scientists.org.nz/files/page/2010/07/NZAS_RULES.pdf)
28. <http://www.sciencemediacentre.co.nz/>