

Grumpy scientists: the ecological conscience of a nation

Third plenary session

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Dan Lunney: This plenary opens with the closing speech from Mike Calver to his play on journal impact factors. Not only is it interesting in itself, but it is necessary to read it to understand the subsequent discussion.

Mike Calver: It's clear that there are problems, severe problems, with using these as ways of assessing journals, as ways of assessing individuals, and all of those grander extrapolations that start to look at departments, institutions and even countries become a little suspect as well. So how do you fight back? Indeed, if you have to front a promotion committee, put a case for yourself, how do you go up with some substance and not a show of a few numbers rather like *The Emperor's New Clothes*.

One of the first things that I'd like to suggest that comes out of some of the discussions we've had today is that we need to be looking at a wide diversity of measures when we attempt to come to terms with the achievements of somebody's work. I've chosen download statistics to emphasise here as one example of something that you can do. For those whose institutions maintain a repository where you can log in and check, and see what's going on with download statistics on your papers, you may get a few surprises.

I did that at the Murdoch University repository and discovered that the paper of mine, that has far and away more downloads than any other, is a paper that has never been cited. What's going on? The paper in question is one talking about how to teach capture/recapture to high school students. It's not something that's made a great contribution to the primary literature, which is why there are no citations, but those download statistics show that school teachers from around the world are logging on to get ideas and inspiration. It's another perspective that you can put on your work.

The next item that people may not be aware of, and something that may be of interest if you publish books or book chapters, is Google WorldCat. It will take you to a fancy catalogue where you can put in the details of any book, and find out what libraries in the world hold a copy. Again, this is completely divorced from citation data, but if you can identify which libraries are holding copies of a particular book, you've got an idea of readership, where it's concentrated, and so on.

You can also use what Frances [Calver's hero in his play] suggested in her interview, corrected indices. Everybody has gone on about the Hirsch index as though there is only this single one. There are, of course, many, and they're suited to different tasks. Whether you have career breaks - for example - you can find the appropriate index. You can correct for multiple authorship if you largely publish alone rather than with colleagues. Have a look at some of these options, and if you want to find them, the simplest way of doing so is to Google "publish or perish". By Googling "publish or perish", it will take you to freeware that will

extract citation information from Google scholar, and gives explanations about the different summary statistics that can be calculated from it, and what they mean. So you can attempt to get that multi-variant perspective.

For those who play around in bibliometric science, it's possible, using the cited reference, to search within that to profile the country of origin of people who are doing the citing. It's an interesting little line that you can do to demonstrate that you're getting citations from across the world or from particular regions. It's all part of building a picture of the nature of work and what people are doing.

Also, as part of fightback, we need to look closely at breaking what Peter Lawrence called the cult of a journal. By this he meant the obsession that unless something is published in an absolute top-flight journal, somehow it's no good. As Frances explained, there are reasons why papers in other than the top journals can be good and very useful. It's important to stand up for it, and acknowledge that there are empirical data from many disciplines that says you cannot judge the quality of a paper by the journal in which it appears.

Finally, I'd like to make a call for hindsight. Most people who sit on promotion committees, grant assessment panels and the like, have opportunities to look widely back across a record when making decisions. Unlike journal editors who have only a manuscript in front of them, they have to project likely usefulness and value, those who are sitting on those panels and committees can look back over a raft of evidence. I think they owe it to people who have applied for jobs or for promotions, or written grants, to look at the bulk of information available and weigh it all up in making their choices.

To end, I should like to specifically thank Tessa Lunney who is neither brash nor crass for playing Frances, Noel Tait who can be grumpy in a good cause for playing Joe, Brad Law who is a little bit of voice of reason and prepared to listen in his part as Peter, and Pauline Ross as Sue for keeping them all in check.

Dan Lunney: Thank you, Mike. Thank you, actors. The last part of the plenary is being managed by Pat Hutchings.

Pat Hutchings: If you had been sitting on that panel, would you have promoted Frances? [Show of hands gives overwhelming support]. Is your support based on her resilience or her ability to question what the terrible guy from Human Resources was saying, who obviously did not understand the quality of her research, was doing to her. Was that the reason why you support her promotion? Her honesty? Her capability?

I'm wondering, having sat on a lot of promotion committees myself, why we haven't got to that point at the museum where we're fixated on the citation thing. I think that Mike has carefully highlighted some of the stupidity or meaninglessness of some of these indices, but we're all

being obsessed with it. Can I have some comments from the floor about the citation indices and their role?

Graham Pyke: I'm one of those rare people who is a highly cited author. On that basis, I'd like to say like it or lump it, citations are becoming increasingly important. You younger ones out there will have to pay much more attention to them in the future. Fortunately, there are strategies to improve the citation success that your publications achieve. Those strategies, at the same time, will improve the quality of your publications and therefore contribute to our science.

Paul Ehrlich: I totally agree with Graham. On the other hand, I think it is really sad. I've been on dozens and dozens of committees. I've been 53 years in the department. I've sat, I think, on every single promotion committee discussion eventually. I have never heard the words "citation index" used in any of the discussions at Stanford. We get letters from the best people in the world. We read the papers ourselves and see what their content is. We look at the bibliography and so on, and I think Graham is absolutely correct. More and more places are going in this direction. It's making more and more places lousy because you really have to know the science, and get people to know the science to evaluate the people, if you want the very best people.

Pat Hutchings: Thank you, Paul. I think that's quite sobering. I hope there is some reversal, but I'm not convinced.

What are the take-home messages from today? I'm hoping that we're not all going to go home feeling slightly despondent, that there's absolutely nothing we can do, that we're sitting on the edge of a precipice. So what I'd like to try and extract from you is what can we do? I would like Richard Kingsford to give us some ideas as to how we're going to get that Murray Darling scheme implemented.

Richard Kingsford: I work on the Murray Darling; it's a hot topic at the moment, and it's to be tabled in parliament at the end of November. Hopefully there will be a lot of water for rehabilitation. How do we get there? We haven't got there yet, but you need good science, and you also need to be able to get that to the politicians and to the community. Just to beat the drum again about engaging with the media, trying to talk as much as we all possibly can to a broader church.

We're quite good at going to our conferences and writing our scientific papers, but I think we need to be a lot more professional about the way we deal with our outwards communication. When I think about the media, I think in the same way I would think about a scientific paper. We all make a decision as to which particular journal we should our paper. At the same time, I make a decision about which journalist can I send this particular piece of work to, or interest them. Not only that, I think that part of the process of interesting the journalist is to ask, what's the angle. Why would Joe Public be interested in what I've got to say? What is it that is important here?

There are lots of barriers. I once went through the journal *Wildlife Research* and looked at in-the-field work to publication. The median was two and a half years, and the range was 6 months to 21 years. The point is that by the

time you finish the paper, you never want to see it again. The last thing you want to do is talk about it, but we do need to talk about it, and get it out there into the public. The last thing I would say is it's not just about us getting out there and telling our story. You've got to engage supporters.

There are lots of people who don't have the detail of the science, but they know what's happening to the environment. You need to build them into your narrative, into the way you tell your story. A paper in *New Scientist* was talking about climate change and the problems of selling the climate change story. It was work by a psychologist who, when the scientist said, "This is climate change and it's having a big impact," particularly to conservative voters, they just didn't believe it. But in a controlled experiment, the researchers dressed up a republican, with exactly the same message, same environment, and suddenly the appreciation or understanding went up. To me, there's a real message here in trying to engage people who aren't scientists, but are able to support the science. There are lots of people out there, but building them into the narrative, and the way you tell your story, is important because people will see you as a scientist and say you might have a vested position to push.

In my area, where I know that every story I do is going to be controversial, I know the journalist is going to go and get someone from the National Irrigators Council and say, "What do you think about that?" They will say that my research is rubbish, because it's not in their interests to support it, but I know that if we build trust with somebody who has been living on the river for three generations, and they're able to say a similar sort of story, it does build that credibility.

Pat Hutchings: What Richard said is absolutely critical. I watched the late Virginia Chadwick (Chair of the Great Barrier Reef Marine Park Authority) build allies within the fishing communities along the Queensland coast about the need to rezone the Great Barrier Reef. She received death threats, but she hung in and managed to convey the science. She was a good communicator, although not having any formal scientific training herself; she listened to her scientific staff and absorbed the information. Can I have more comments, because I think this is such a critical point.

Andy Beattie: For fear of beating my hobby horse, I want to emphasise the importance of getting the science right from the beginning. I believe that, because biodiversity has been hijacked by various private and illegitimate interests, we have taken it away from the possibility of gaining a coalition of people who would be interested in its conservation. From the very beginning, if you looked, until recently, at government web sites, biodiversity has consisted of three things; endangered species, remnant native vegetation, and invasive species. Farmers hate all of them because they bring legislation hammering down on their land.

One farmer, when asked what "ecosystems services" meant, replied "government interference". The reason was that we focused on defining and using the term biodiversity. We got it wrong from the very beginning. The science was hijacked by less scientifically trained people.

This precluded the opportunity of building coalitions of conservationists and people in industry, and developing the process of looking for compromise and ways in which there would be win-win situations.

Deborah Rose: I vividly recall a number of years ago driving through a little town in Queensland, which I think was Hungerford, and noticing that there was a consultative meeting for the Paroo. My partner and I thought, let's go to that, it sounds interesting. So we did. We sat in the back of the room and heard Richard Kingsford give a wonderful presentation. It was a very interesting moment for me to realise what a good communicator, who really understands the science, can do.

Some people have a talent for this. Richard was also very good with his visuals today, and it was evident then as well. We should cherish the people who are good at this and make sure that they get as much exposure as they can.

There is often something I hear, and that is the idea that it's a waste of time to preach to the converted. I don't think any of us really wants to preach, but the converted need support too. These are people who are at the coalface every day; it's stressful and can lead to health problems. It can also lead to hopelessness and to incredible discouragement in how one leads a worthy life. It is one of the things that we, as members of the public, but also as advocates, and as people with a kind of knowledge that say there's a right and wrong here. We should help and support those who are fighting to get a conservation message out.

Nicki Markus: I wasn't going to comment because I really admired Deborah Rose's paper today, but the point that is so salient is that we're not only having to manage the environment, we're having to manage the people. With Andrew Beattie saying that some of the scientific messages have been hijacked, I would hook into what Richard Kingsford was saying, which is hijack them back.

As NGOs know, as anybody knows who's trying to resolve a complex problem, and deals with different groups of stakeholders and different demographics and different distractions, the messages have to be pitched to people, be they governments, be they people handing over money or refusing to change their behaviour in a way that resonates with them. There are many stakeholders involved. The same message may have to have 12 different shapes. The answer is in understanding how people work, understanding human nature, and what it is that makes people not listen.

I've been looking into this a little bit more in the last few months that I've been writing, and I've read an interesting book called *Thinking Fast and Slow*, which you may have seen. It's by a guy called Daniel Kahneman, - he's a Nobel laureate in economics, and he has an exquisite way of summarising 50 years of behavioural research into human nature into one book. It's got nothing to do with the environment, but it's possibly the most interesting and the most important book I've read in terms of being able to influence things of what happened in the environment.

Pat Hutchings: What I'd like to go back to was something that Richard Kingsford alluded to, this need to communicate and science education. Do we need to bring it into

secondary schooling? Do we need to actively encourage people from the beginning, and then carry that on into the universities to accept that communication is important?

It's not just a question of going out there to do your research. It's a question of making sure that not only your colleagues know what you're doing, but also the rest of the world. Would anybody like to try and bring that idea up as to how we encourage people to become communicators, whether you can learn it or whether it's just something you're born with?

Pauline Ross: I showed, in my talk, a document called the *Threshold Learning Outcomes of Science*, and there is a panel called the "Higher Education Standards Panel", which is chaired by Alan Robson who used to be the VC of the University of Western Australia. At a recent meeting, he held up this document, which outlines what science graduates should be able to know and do by the time that they've completed their degree, and it says, "Communication." It makes a big deal of communicating for a range of purposes, a range of audiences, both written and oral communication.

Universities will start to emphasise communication. I can see it already in schools, where they're emphasising communication, but I think the place where we're falling down is in the tertiary sector. We do a lot of oral presentations that almost kill the students who are listening to them, and certainly kill the lecturer. You might end up with 30 groups, or you try to group them, so you can speed it up, but no matter what, you kind of die. It's the archetypal death by PowerPoint experience. You really are dead by the end of that assessment task. So I deleted all of those from my unit. I couldn't cope with them anymore, but, according to Alan Robson, assessing graduate students' communication skills, was necessary to assess the quality of our graduates in Australian institutions.

Harry Recher: I want to comment on the ease or difficulty of teaching communication skills to students. I've been involved with courses given to postgraduate students at Edith Cowan University, University of New England, Curtin University, all of which were taught by my wife, who is a distinguished toastmaster, an excellent presenter herself, and a very good teacher. Initially, when you ask a group of postgraduate students, or tell a group of postgraduate students that they have to take a unit in public speaking, and that they will be required to stand in front of their peers and present a paper, one of the most common things you encounter is sheer terror.

Once they're given simple instruction as to how to do it well, they uniformly adapt, enjoy it, and become good speakers. It only takes 6-10 weeks of instruction, meeting once a week for three hours, to bring a poor speaker at Honours, or Masters or PhD level up to a point where they can give a seminar to the department or to a conference without everybody in the audience falling asleep, and they want it.

We started giving postgraduate instruction in public speaking at Edith Cowan University to our students, and then I organised, through the Royal Society of Western Australia, to hold an annual postgraduate symposium of

all the universities where students could present their PhD work. ECU students excelled so well in the first year that we had the students from the other universities complaining to their schools that they were being disadvantaged; that Edith Cowan University students had an unfair advantage by having been instructed in public speaking. My wife wound up teaching public speaking at Curtin University, and I know courses were introduced elsewhere as well.

It's possible. Brooklyn Primary School has a program of public speaking for sixth form students, given by a couple of local toastmasters. The kids love it. They can't wait to enter sixth form so that they can give the talks. I don't know why we just don't do it routinely at all universities and in all primary and high schools. It's a critical activity for all science majors, for all educated people to be able to stand up and speak clearly and simply to the general public and to their peers. Once you can do that, then you can speak to journalists. It's not difficult.

Richard Kingsford does an exceptional job. We can all name the people in Australia who do exceptional jobs in speaking to the public. Richard Kingsford and David Paton are two names that jump forward; both have had significant impact on changing the way in which we're conserving and managing our wetlands in Australia. We need more people like that across a wider range of disciplines. If we have to give them instruction on how to meet with the community, and present views, what's so hard about that?

The biggest impediment I've ever encountered to giving public speaking instruction, or communication instruction to postgraduate students, are my fellow academics who uniformly can't speak their way out of a wet paper bag, and feel threatened when their students can speak better. The tragedy was that they didn't want to join in the course and learn how to do it. It can be done, it should be done. You can see with Richard Kingsford the impact you can have by doing it well. We should all be trying harder.

Pat Hutchings: Richard. Do you want to tell us how you learnt to communicate?

Richard Kingsford: First of all, I was so terrified as a PhD student, partly because Tony Underwood was in the audience, but I do remember that I had to have drugs to slow my heart rate down. It took me quite a long time to get over that until I was sort of comfortable, but interestingly I did not get into this media game by intent. It was pure accident, and those of you, like Dan Lunney, who have been with National Parks for a long time, will remember that when I joined National Parks, there was already a wetland ecologist, Sue Briggs. There was quite a bit of talk about that's really one too many, and being the young kid on the block, I knew that the obvious target might be me.

I remember, at the time, I said "how can I let people know what's going on in my life and what research I'm doing", and when I said "people", there were only three people I was interested in targeting; my immediate manager, the head of the science section, and the director-general. I knew Geoff Burchfield, from [ABC's TV science show]

Quantum, and I did a story with him. I made sure that every single one of those people who were giving me trouble knew when that program was on, and if they hadn't seen it, I made sure they had a video of it.

That's what I mean about being professional; making sure that you treat communication as part of your profession. It's important. It means you have to take the same deliberate steps that we routinely are trained to do when we prepare our papers for journals. We should have the same sort of training when it comes to communication, including being able to communicate with journalists. The journalism thing is not very difficult. It's having a pretty simple message and being able to say that again and again in a fresh way, and ultimately building up a huge list of journalists and relationships that allow you to get your message out whenever you want.

The delight for me now is that I get called up by journalists all the time, "Have you got anything on the backburner, Richard? Is there anything you've got going?" and I will think of some things. They might not be actual research where I have results, and they will be on the theme of what's happening in the system but, depending whether it's television or whether it's radio, the pictures that you might have to help the story. The point is that I stick to the key message that underpins all my research.

So I would just encourage people to not think of this as a difficult thing to do. You just have to make sure it becomes a priority. There are lots of things that stop you doing that as scientists. There are lots of opportunity costs. A lot of my scientist colleagues say, "I don't know how you do it. It takes so much time." Yes, it does take so much time, but you have to devote the time to it.

I was asked if the PowerPoint presentation I put together was done by me. Yes, it was. I've learnt this new way of doing things, and it's an interesting way of presenting information that is a little bit more dynamic than I guess what we're used to. So I'm always looking for new stuff to do.

Pat Hutchings: Thank you, Richard. It's lucky birds are quite charismatic. We recently had some publicity about the documentation of the biodiversity of Sydney Harbour where we have over 3000 species of the five major groups of animals in the Harbour. So when the journalist phoned me and said, "I'd like to come and interview you. What do you work on?" "Worms." "They're too small!!!" So we had to go with the large crabs. I think if that's the take-home message from today, I think the RZS has achieved something. We need to continue to do our research, but we do need to communicate the value and the usefulness of our research to try and prevent us from going over the edge, or perhaps we're going to go anyhow.

Thank you very much indeed. I'd like to thank Dan Lunney and Harry Recher for even contemplating organising this symposium. There were people on council who said, "Grumpy old men? How boring. It's going to be a whinge day," but I hope we have managed to have the whinge, but also to have some constructive comments. So thank you all the speakers, and thank you, the audience, for your participation.