



How scientists can help themselves and why they must Simon McKeon Speech to CRCA Conference 2012

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DIGNITARIES TO BE ACKNOWLEDGED Minister Evans (others to be advised)

AUDIENCE ANALYSIS AND MAIN DELIVERY MECHANISMS
Delegates drawn from CRC Association membership. No recording planned

OBJECTIVE

A thought leadership piece about the role and future of science, also positioning of CSIRO as partner and collaborator with CRCs and their various contributors.

THE SPEECH

Acknowledgements including Traditional Owners

Hello and thanks for inviting me here today

I would like to acknowledge that we are meeting on the traditional country of the Kurna people and show my respect for their spiritual relationship with their country. I acknowledge the Kurna people as the custodians of the Adelaide region and that their cultural and heritage beliefs remain important to the living Kurna people today. I would also like to pay respect to the Elders both past and present of the Kurna Nation and extend that respect to other Aboriginal people present here today.

It is a privilege to be giving the 2012 Ralph Slatyer address. As Australia's first chief scientist, Ralph Slatyer was instrumental in the establishment of Cooperative Research Centres, and the catalyst for us all being here today. He had a distinguished career at CSIRO, at ANU and as Australia's Ambassador to UNESCO. It is therefore highly pertinent that what I'll be talking about today is how we must all balance the passion for science and research, with the importance of engaging with our communities on the positive impact science has on people's lives. Slatyer was fascinated with the opportunities that a good understanding of biology could bring to bear on the quality of people's lives. In a 1993 interview he spoke of first studying agricultural science because of the possibilities for feeding the world. And while he was attracted to the illustrated brochure of a person in a greenhouse with a lab coat, his career ended up taking that vision to the global stage.

Two years ago, I was approached about joining the CSIRO board. And I have been honoured and have revelled in the opportunity to chair such a special institution and one that I've admired since my primary

school days. But as I have settled into the role of Chairman, one question I have frequently had in different fora is, “Why is science not more respected?”. Why might it be declining as a career aspiration among young people, and how do certain elements of the media get away with rampant attacks on science particularly, say, on the big issue of climate change? How can scientists effectively focus on their important work when their very authenticity and credibility is under attack?

Science is why we are who we are

I certainly can't claim especially as a non scientist to be a spokesperson for all of science, but as a simple human being I know I have benefited immensely. Who would want surgery without anaesthetics and antibiotics? The comforts and advances we all take for granted and which have become our way of life are incredible. We eat a huge range of delicious, fresh, safe food; we very quickly get to where we want to go; we talk face to face with our families even when we're in different cities. In other words science has enabled us as a species to have an extraordinary existence and one, I would suggest, that would not have been imagined just 3 or 4 generations ago.

Explosion and disaggregation of knowledge

Humans are a problem-solving species and we will constantly be generating new knowledge. And this is critical in a world where data is readily available. In fact it is estimated that the Square Kilometre Array telescope, wherever it ends up being built, will generate as much data in its first week of operation as currently exists on the whole of the internet. It is hard to get your head around what that might mean when it is crunched into knowledge.

The new knowledge paradigm doesn't fit with historical views either ideological or cultural. Knowledge is still power but the mass democratisation of that power, the sometimes instantaneous transfer of new knowledge into the community means that our traditional structures are all under challenge. That includes

structures such as universities, government and even families. The respect inherent in a lab coat and some interesting equipment has probably been well eroded, but what has replaced it?

As a science community we need to be aware of this seismic upheaval and, not just be aware of it, but to democratise and share our own work and our own thinking. We can no longer assume that power is institutional, and we can no longer assume that respect and relevance will be accorded by our titles “professor” or “doctor”; or by our institutions, whether they are CSIRO, a University or other relevant research body. It is now incumbent on each and every one of us to think about what this means, and what therefore, is the responsibility of a scientist or institution to demonstrate relevance and the sheer importance of our work at a time when the population’s explosion and consumption habits of our species is testing the very limits of Mother Earth.

Scientists must communicate the way people want to hear

CRCs are great models for the kind of multidisciplinary thinking that must be applied to some of the big questions facing us in Australia and globally. Climate, food security, water, energy, biodiversity and animal borne disease, are all large, complex interrelated problems for the world. But has the science community done enough to share the benefits and impacts of its work in addressing these big questions?.

And in saying that, I appreciate what a fine balancing act this is. We want to talk about our work and our breakthroughs but the general community, if they are excited about it, wants to know “Where can I buy one?” and expects a complete solution rather than a step along the way. Often the commercialisation and impact of a product, technique or knowledge set is many years down the track from a breakthrough. Nevertheless we and our PR people continue to batter the community with stories of our greatness, stories that our community engagement research shows are often forgotten almost the moment they are broadcast in the TV news or appears in a newspaper .

In this i-World, this world of personalised media, how do we inform the community on issues of science and technology when science itself is being questioned? We live in an environment where anyone can post an opinion or unsubstantiated fact instantly and it jockey for space with peer-reviewed science. Indeed, our best scientists who have committed their lives to discovery are typically outgunned by a so called celebrity who has just discovered the medium of Twitter to communicate his or her view of how best to deal with a particular addiction. The electronic global village that Marshall McLuhan wrote about so presciently almost half a century ago has arrived. Instant communications have collapsed time and distance. Everything is now and everyone is here. Stakeholders are on-line critics. We are in an ultra-competitive, ultra critical climate.

And the flip side of this is when the science community resorts to hyperbole and overreaching claims on the basis of research. I feel it is particularly prevalent in the reporting of medical breakthroughs. We frequently hear of a great cancer or alzheimers breakthrough, but identifying a relevant gene or a protein is not the same as curing cancer or alzheimers. It is no wonder general community views lag behind scientists on the importance of science.

Politics makes things even murkier

And if science plays into the political arena it is equally problematic . I am not trying to detract from the fact that science delivers to humanity in ways which are awe inspiring, but the onus is on the science community to explain what it does and why, and to acknowledge that there are many other factors society and its elected decision makers need to take account of. While all scientists and researchers are human, and entitled to their views, it is a rare scientist who manages to maintain scientific integrity and still advocate for policy positions. Of course in CSIRO, we are expressly established to provide advice, and not to comment on policy or political processes, but even for researchers who work in different institutional structures or independently, the line between politics and science can be a minefield which requires careful navigation.

Good science communicators

So what can scientists and researchers and the organisations for whom they work, do? Firstly it's not just about the science! It's about being able to demonstrate the *positive impact* science can give to the community and society – if we really want our science applied we need to understand the community and its needs, engage with it on terms it can relate to, when and where it wants to.

And where are the scientists the community can relate to? I've heard wistful talk comparing sports stars and scientists and one of the biggest issues is accessibility and visibility – where are they and who are they talking to? Which channels do the science community use? Often it is science community focused channels. For CSIRO a story could be run on the ABC most days, and the net result of that is that we are preaching to the converted. Those who know and get CSIRO tend to be older, and more educated, precisely the ABC demographic. There are however some notable and gifted science communicators and we can all take some lessons from them.

Brian Schmidt has parlayed his wonderful Nobel Prize win into a passionate campaign for science education, to the point of donating a large chunk of his prize money to that cause. Every opportunity he has he delivers the same message about the importance of investing in science education. I applaud him. And I was pleased to note that the federal government agrees. In the Budget last week it extended the support for the Scientists in Schools and Mathematicians in Schools programs run by CSIRO Education.

Tony Peacock of course often speaks in public about the benefits of cooperative research, and has been a great advocate for CRCs and their benefits.

I recall a terrific 7.30 Report story featuring Brian Boyle, the project Director of Australia's SKA bid who is another gifted communicator and truly able to bring the importance of wondering about the universe to

life for everyone. Many people don't get the point of looking back in time to postulate theories about the origins of the universe, but it is unlikely those people have spent any time with Brian Boyle. To quote him "we have been looking through a keyhole at the most fantastic wonderful room, and the SKA will allow us to open the door and step into that room".

It's a powerful metaphor that resonates strongly. In the same story Brian talked about the life changing benefits we already take for granted which are results of radio astronomy, Wi-Lan, medical scanning, GPS. We don't even know what the next wave of benefits will be. A communicator who can share the positive impact of science, as well as garner commitment to the importance of pursuing fascinating science, is a powerful communicator.

I'm a Melbournian. Gus Nossal, for me, has not just been a hero for what he has achieved in the lab but in how he has taken mere mortals like me, figuratively speaking, into his lab. And he starts with passion and enthusiasm and bookends it with the sheer joy of explaining what it's like to be the first to plant a flag on some scientific mountain.

Accessible is not dumbed down

Our communication people have been making a real effort to widen the positive impact story, with an ambitious goal of getting most Australians to be capable of naming an impact CSIRO has had on their life. And that means when the State of the Climate Report was released in conjunction with the Bureau of Meteorology in March, it wasn't enough to achieve in-depth coverage in the broadsheet newspapers, the goal was to appear prominently and accurately in Australia's most widely-read newspapers: the Herald Sun and the Daily Telegraph, and on the commercial television news.

THE Conversation as I hope you all know is an online research outlet, written by researchers, academics and scientists. However the specific editorial brief is that the stories must easily be read by 16 year olds (or

otherwise the present Chairman of CSIRO!). And an added benefit and probably a large part of the reason for the impressive growth of The Conversation is - guess what? Even the science community likes its informal engaging mode of communication. We need a lot more of this type of innovation. The key is to recognise that a big chunk of the current challenges facing science are of its own making, and the solutions need to be also.

Science must report to shareholders and investors

Science is owed no more respect than any other profession. It needs to earn it and continually justify it. When there are so many other demands on the community's taxes it's up to science to demonstrate the dividend from its investments and the sector is sometimes disappointing at this.

It may be anathema to talk in terms of dividends and dollars but it is truly speaking the language of the Australian people. Every working person in Australia is reminded each quarter of the state of the economy, simply by opening the envelope from their super fund. People are comfortable talking about interest rates in terms of basis points and fractions of a percent-financial literacy has spread. We need to acknowledge this and both reference this and think about what science needs to do to generate a similar level of scientific literacy.

Crowd sourcing and transparency

I believe transparency is key. Many agencies and organisations talk about transparency, but our traditional structures mean we have a long way to go before we achieve it – but the potential benefits are such that it is worth finding ways to modify existing policies and practices to accommodate a more open approach to data and research outputs. One of the interesting movements in science and research is the move towards open source data. When you make the raw data available, there is the opportunity to bypass criticism. And more widely available data can also mean new interpretations lead to new knowledge and new ways of sharing.

Through the Terrestrial Ecosystems Research Network, a CSIRO developed website will enable coastal councils, and other coastal stakeholders, to find research easily at a national level, and then focus on regional and local research projects. CSIRO realised local councils had a low awareness of the range of coastal research available. By creating a central webportal to access the latest research data, and using Google maps and acronym free research summaries to improve access, decision makers will be able to better evaluate proposals for their communities.

There have been a few “hack” events held in the name of open government, where large public data sets are opened up to a community of passionate developers with the brief to just see what they can do with it. These events have delivered insight in the forms of apps, visualisations and new ways of cutting and slicing the data called mash ups.

Giving access to real data sets is a bit scary for some, but imagine what can happen when they are examined by people unconstrained by the lens of a particular field of study, or a particular theoretical position. Imagine the intellectual property that could result. We are really only standing on the edge of possibility as far as open access to data is concerned.

Social Science is Science too

Peta Ashworth leads CSIRO’s science into society group which has gained an international reputation in researching stakeholder perceptions to climate change and low emission energy technologies. One area of work is a behaviour change program called Energymark that is being implemented across Australia to reduce emissions at the household level. This research is important because energy users at the community level have a critical role in climate change mitigation both in technology acceptance and through behaviour change. Energymark gives people the tools to hold kitchen chats with neighbours and family about what they can do to reduce their energy usage.

It is the epitome of act global but think local. The appetite for transition to a low carbon economy must be stimulated at the consumer level, or naturally market forces will work against change. And for consumers to be interested, they must be informed and connected into the decision making processes, rather than passively accept policy or price imposts on them.

This work means social scientists are important partners in the process of achieving science impact in energy technology and climate adaptation.

Science has changed so much with the emphasis now being on bringing together skilled multidisciplinary teams to tackle problems, just like a CRC. We need to ask ourselves whether those teams are representing themselves well, whether they are adequately engaging with others throughout the research process from concept to discovery to implementation.

Perception is reality

One of the great questions from metaphysics, and I do not apologise in concluding today for straying into the world of humanities, is whether something can exist without being perceived. Many scientists might say “yes” and I aim to perceive it! But for society and human nature it seems that to be is to be perceived. And I make this point because it is so relevant to science. We aim to make an impact, we are funded to do so, and therefore we are required to engage with a broad range of people to ensure this impact occurs. So do you believe, in your research area, that you can put your hand on your heart and say, “Yes I am doing enough to engage”?

As we grow to 9 or 10 billion people inhabiting the planet, we need science like never before. Not just for enquiry and improved living standards, but possibly for our very survival. If that’s not important enough to communicate well, then what is?

Thank you.