Ralph Slatyer Address 2019

Science Communication in Today's Society

Good Afternoon. I would like to acknowledge that we are meeting on the traditional country of the Kaurna people and I pay my respect to the Elders, past and present, and extend that respect to other Aboriginal people present here today.

Thank you for your introduction, Belinda, I'm honoured to have been invited to deliver the 2019 Ralph Slatyer Address. It is wonderful to have here both Professor Slatyer's daughter, Judy, who is Chief Executive Officer of the Red Cross and son Tony who is well known for his work domestically and internationally in water resources policy. And here we all are gathering in Adelaide, one of my favourite cities and the proud new host of the $250 million Smartsat CRC - the biggest investment in space industry R&D in our nation's history and of course the new Space Agency. I know how hard Premier Steve Marshall worked to secure both.

Professor Slatyer would be gratified; the extraordinary man he was. For him, a distinguished career in science wasn't enough, he went further, to make an even greater contribution as a man of society. The subject of this address, Science and Society, is both a fitting and thankful nod to his impressive legacy. Might I also comment wearing my FTSE hat that I am using "science" as a short hand for science and engineering

Well what do we know about Professor Slatyer? Of course he was Australia's first Chief Scientist, appointed to this role in 1989 by the late Prime Minister Bob Hawke. But Ralph Slatyer was also an early and passionate environmentalist and an advocate for nuclear energy, particularly storage in Australia.

Back in 2014, giving this address, also here in Adelaide Bob Hawke noted

“Ralph already had an outstanding career, by the time I appointed him… as the Chief Scientist... .One of the central goals of that government was to promote excellence in Australian science, research and innovation and to more effectively apply research findings to the creation of our national wealth.”

But, Ralph Slatyer quickly recognised that to grow our national economy we needed to increase our export base from lower value-added mining and agriculture to higher value-added knowledge industries. He believed our brilliant science research centres could become commercial export centres and backed himself.

He knew the challenges. Not least that the geographically disperse and small scale of the scientific efforts across our vast nation would make it difficult to collaborate within the sector. To envision there could be collaboration across all three sectors of science, government and industry was courageous.

But, his belief in the transformative power of science and research won out; and his vision that science research and business could be the vehicle for Australia to create a whole new pathway for financial and social prosperity was born.

Ralph Slatyer had the support, the convening and communication skills, and the courage to convince the three sectors to establish the CRCs. His close personal relationship with Bob Hawke, with whom he attended High school in Perth helped, particularly with business. But really, it was Ralph Slatyer's multi-disciplinary talents; as a scientist, a communicator, a campaigner and social advocate, which delivered a profound and lasting impact on our nation's economic wellbeing. He made our lucky country become a clever country.

A few months ago Tony Peacock called and asked me to give the Ralph Slatyer address. He reminded me that Simon McKeon, once my boss at Macquarie Bank, Australian of the year and chairman of Csiro is the only other businessperson who has given this address.

I have to confess I am feeling the pressure Tony and I do hope another business person gets a chance.

Any way, many of you know, after I got fired by Kerry Packer as his CEO at PBL in 2004 because James Packer and I bought Burswood, I attended a think tank in Queensland. There I met the Adelaide thinker in residence, Baroness Susan Greenfield. I admired her vision for science communication and so together with then SA Premier Mike Rann, we founded and I now chair both the Australian Science Media Centre and later The Royal Institution of Australia. The Ri Aus now includes the Australian Science Channel, Cosmos magazine and The Scinema International science film Festival being screened here tonight. The Australian Science Media Centre and The Royal Institution of Australia are based here in Adelaide in the old Adelaide Stock Exchange building. Together they are probably the largest source of science media content in Australia outside of the ABC. I confess that after almost 15 years in science communication I have seen a lot.

And so have many of you here. May I ask if you bring up the topic of science communication in our society over dinner what will you get? My experience is there are some common themes.

A lack of role models and media stories to inspire the next generation to study STEM is one. The need to enhance our nation's understanding of the science around our key issues, if we are to have a chance of forming practical solutions, is another. That we need the public and politicians to listen to and advocate for “the evidence” to improve policy-making and enable meaningful action. And that we need more media coverage to elevate the importance of science and research in building a better future, to help persuade government to commit to more funding.

Oh and of course how do we stop some of the pseudo-science stories that seem to get so much airtime. These stories can be dangerous to the future of our people and our planet. What would be your recurring dinner topic on science communication?

A couple of weeks ago I visited the Kennedy Library in Boston. My Dad knew President Kennedy both as a Senator and a President.

Thinking about this address, I was struck by President Kennedys opening quote in the Library's introductory video:

"As every past generation has had to disenthrall itself from an inheritance of truisms and stereotypes, so in our own time we must move on from the reassuring repetition of stale phrases to a new, difficult, but essential confrontation with reality.

For the great enemy of truth is very often not the lie--deliberate, contrived and dishonest--but the myth--persistent, persuasive, and unrealistic. Too often, we hold fast to the clichés of our forebears.

We subject all facts to a prefabricated set of interpretations. We enjoy the comfort of opinion without the discomfort of thought. Mythology distracts us everywhere. In government as in business, in politics as in economics, in foreign affairs as in domestic affairs…".

Communicating the challenges of the cold war and reshaping of the US economy were not science-related issues. No one doubted the science of nuclear weapons nor the benefit of winning the race to space. That is why, science does not get a mention in President Kennedy's list of distractions by myths and biases.

Leaping forward 55 years, we find ourselves in a different situation. Never before have we had so much scientific information, but somehow, science is still yet to take its place at the forefront of our nation's cultural psyche. And, on certain topics such as nuclear energy, water resources and global warming, our society is completely polarised.

This afternoon I plan to discuss the dilemma for science communication in Australia by considering the intersection between science and society - and how this contributes to the key challenges we face.

Here is my summary of the main challenges I will explore:

- One, science as a mass media information genre is more expensive to produce and suffers from specific barriers to media engagement.

- Two, the financial collapse of institutional media and the explosion of search engines and social media has created the opportunity for pseudo-science and myths to flourish.

- Three, a monumental breakdown of trust in institutions by the mass population, particularly trust in the media, further undermines the conventional science communication channels.

- And four, the climate change debate has made it culturally acceptable for even the most well educated in our society to argue a position based on their beliefs - or political motives - rather than evidence.

To explain the first point around media engagement-related challenges with science media, let me briefly explain how science media works.

Typically, Science media will emerge in one of three ways: through a scientific discovery, which is then published in a Journal; through natural events, including disastes; or through curated events, such as a conference, a government report or a lobby group campaign.

The volume of science media content is weighted toward discovery because journals are a large and successful distribution method, on which the business of academia depends.

Science media as an information genre has characteristics that limit its ability to be as successful as other forms of mass media such as business, sport or politics.

Let me give a few examples. Science is not a complete story, it is provisional. It often does not have a beginning, middle and an end.

In science the process of debate is also structurally different. Science does not seek to prove something is not true. How do we disprove that a tea pot is not going around Mars.

Scientists agree or disagree with one another through the discussion of facts, and the interpretation of evidence. And science does not use values. Truth is realised through the evidentiary process.

By contrast, as mass media information genres, sport, business and politics, are not just about sharing new information or facts. Contest and controversy also create valuable media content.

In the case of political and business information, the “balance” of opinion is a critical part of the validation process drawing out a sense of “urgency” to comment by interested parties. Science does not have a “balance” of opinion since it is based on evidence.

Also science is often highly specialised, where only a small cohort can relate to the information. The specialisation problem is further compounded if scientists do not engage in the public media information exchange.

This often occurs because scientists believe there is no benefit, no urgency, they are concerned how their comments might emerge in the media, or their institution discourages such engagement.

With that science media tutorial out of the way, let's turn to the challenges.

In 2004, when I left Kerry Packer’s empire the media industry was a small number of well-heeled institutions with significant resources whose gate keepers and owners essentially determined our media diet.

At that time, the science industry was dissatisfied with its media presence. The challenge for science was two-fold. The media gatekeepers had almost no personal experience with science, and for the reasons I just described it was expensive and risky to produce compared with sport or politics.

Specialist science reporters were helpful, but their focus was mostly on new discovery rather than the science in our daily lives. The scientists who could comment were either not available, not comprehensible or all made pretty much the same comment.

It was against this backdrop that we established the Australian Science Media Centre, or AusSMC, in 2005. Susannah Eliott who is here tonight has been our CEO for that whole journey.

To reduce the cost of producing science news and media, and increase the availability of scientists, we set up something akin to a national science press club here in Adelaide. Our main objective was to change the cultural paradigm of science in Australia by ramping up the number of evidence-based stories in mainstream media - inserting the science angle into breaking news, whether that was a bushfire, a disease outbreak or a drugs in sport scandal.

Today, the AusSMC has an engaged network of 1,600 journalists and 5,000 scientists, and every day we supply evidence-based content to a large chunk of mainstream news. In the past 12 months, we have contributed evidence to more than 26,000 articles in Australia and overseas. Together with the UK science media centre we spurred the creation of a global network of science media centres, which shares content and collaborates on key global issues.

The AusSMC enjoys access to the embargoed material of most of the major journals.We invite multiple scientists to clarify complicated or contentious research, making the journal release a rich media document equally available to all 1,600 registered journalists. We curate what we believe will be the most relevant issues each week through our “SMC picks,” alerting the media gatekeepers to what is forthcoming in science.

We work with media teams around the country, alerting them when we see their embargoed research, helping to train their experts and providing them with an avenue to the media through our news portal. The public hardly knows we exist, but the media community knows us very well.

Reflecting on how we have gone against our original purpose I think we've done this well but the science and media industries could have done with something like this at least 25 years earlier but we have moved forward.

Let me now move to the second challenge: the financial collapse of institutional media and the explosion of search engines and social media, which has created the opportunity for pseudo-science and myths to flourish.

This began about 10 years ago as a result of two forces: ease of access to new information via the internet, and the almost complete loss of media revenue.

The traditional media industry lost most of its classified revenue to search engines, before eventually losing its advertising revenue to Google and Facebook. The media institutions we knew at the beginning of this century, if they still exist, are a mere shadow of their former selves.

News as one of the primary drivers of audience and therefore revenue has gone. Newsworthy events are discovered first on Twitter, and break as a story well before an accredited journalist has shown up. Even worse, today, anyone who manages to generate a large audience can use Facebook advertising to support their running costs. Their advertising revenue is tiny compared to the old media rate card, but enough to support a very low-cost operator.

The drive to operate in a low-cost environment saw a wholesale purge of specialist media resources, particularly specialist science reporters.

This resource-poor but distribution-rich media landscape gave birth to the 'fake news' movement, kindly coined by the ever insightful President Trump! Recently, it has also given rise to some worrying practices in overhyping amongst some of our most prestigious science and research centres.

The AusSMC team are so challenged by this outbreak that seems to be spreading, that together with the UK science media centre we are considering a labelling system for all institutional media releases loaded onto scimex. These labels will help journalists see at a glance if research has been peer reviewed and has been done in a test tube or in humans.

The media's loss of financial resources has led to some interesting developments by various parties in the science communication world. At AusSMC, we established Scimex as a very low-cost platform for scientists and journalists to engage.

At the Royal Institution of Australia, we launched the Australian Science Channel to aggregate text and video content from our partner university and science institutions, with our own content and distribute that to the public. The Australian Academy of Science has done a great job with their video stories, and following the ABC Board's review of its science media - chaired by Fiona Stanley - we have seen a renewed focus on science at the ABC. The Conversation was also launched, significantly increasing access to readable news from our academic institutions.

The problem is that none of these organisations have found a method to monetise their efforts. Relying on sponsorship, whether from government, universities or business, is challenging and may not be sustainable. With no advertising revenue and a limited science and engineering base in Australia, it is a significant challenge to generate the financial support necessary to create a sustainable high-quality product.

“Science Alert” and “IFL Science” has achieved revenue by driving “click throughs” but the consistency of the evidence base is not always there.

The third challenge is the monumental breakdown of trust in institutions by the mass population, particularly trust in the media, which further undermines the conventional science communication channels.

The revelation of child abuse in our religious institutions, the recent banking Royal Commission, and a rolling circus of leaders in our political institutions, have been a few triggers.

The Edelman's annual Trust Barometer, which measures trust globally and in individual countries such as Australia, showed that in 2018, trust in the institutions of the media, politics and NGOs fell below 40 out of an index of 100. This rampant trust deficit has plagued society from around 2005.

The level of trust in our key institutions becomes even more pronounced when broken down between the informed public, often the more wealthy and educated, versus the mass population. What is interesting is the gap between these two groups.

In 2012, the informed members of our community *barely* trusted our institutions, but for the mass population, trust in our institutions fell to 36 points out of 100.
From a science communication perspective, this trend has made it even more difficult for an institution to communicate to the public, particularly the mass public. At the same time, search engines became a more trusted form of media than traditional media, and trust in social media rose above 30 points in the index. The mass population placed its trust in relatable “someone like me” media, rather than institutions or traditional media.

But we, as science communicators, can turn this problem on its head. The academic community is recognised as one of the most trustworthy information sources. This is supported by the Edelman Trust Barometer, which reveals that the two highest ranked sources of information were “someone like me” *and* academics. In this way, the science industry is well placed to circumnavigate society’s disillusionment with institutions.

While institutions aren't well-trusted, scientists are. Should we consider creating a distributed trust model such as Airbnb or uber- where trust is created by a two way engagement between producers and users rather than institutions? I discussed this at my induction into the Academy of Technology and Engineering. Regional communities, in particular, trust the scientists and engineers from their local universities. As an industry, we need to consider how we might capitalise on society's breakdown in trust to solve this social problem whilst gaining some airtime.

Now, let's turn to the fourth and perhaps biggest challenge for science communication: where it has become culturally acceptable for even the most well educated in our society to argue a position based on their beliefs - or political motives - rather than evidence.

This has been documented in an article in The Journal of Science Communication by Professor Dan Kahan from Yale University, entitled “What is the science of science communication”.

Dan Kahan sets out as follows:

“Never have human societies known so much about mitigating the dangers they face but agreed so little about what they collectively know. … this disjunction features …. divisive conflict in the face of compelling scientific evidence, …we can refer to it as the “science communication paradox”. Resolving this paradox is the central aim of a new science of science communication.”

The new challenge for science communication is the role of behavioural bias. Dan. Kahan demonstrates that, notwithstanding the compelling evidence on highly contentious topics, despite more scientific knowledge, we're less inclined to shed our beliefs than ever before.

He points out that if a community is to survive it should eventually make decisions based on evidence and the more educated members should influence the group, eventually shifting consensus.

He shows that in the case of climate change, nuclear storage and fracking, it is the more educated within the group that hold onto their beliefs and articulate them the strongest. This thought leadership prevents that group from moving towards engaging with the evidence, thereby leading to a polarisation. And if the Mass Population is not listening to institutions generally, then there is no obvious way out.

A more recent survey undertaken by a group at George Mason University and published in the journal of the Royal Society reached similar conclusions.
It is entitled, “Scientific risk communication about controversial issues influences public perceptions of scientists’ political orientations and credibility”. The authors conclude that politicised attributions of scientists engaging in risk communication, is … likely to occur when a …communicating scientist is providing information...incongruent with an individual audience member’s…personal beliefs or worldview.
In these cases, a … “motivated” reasoning model means people will attempt to discredit the scientist by giving a political motive to their efforts.

So, the new challenge for science communication involving controversial issues is around how we help our citizens, and particularly the more educated, to disentangle from their beliefs. If we have not had enough of a challenge trying to communicate with society to date, just using evidence, how do we now shift gear?

Dan Kahan invites us to consider how we might best achieve disentanglement of a free mind. He encourages us to ask “what should we do with what we know”, a question that can unify a society, instead of “whose side are you on”, a divisive question which is sadly more reflective of today's national culture.

The “new science of science communication” requires we acknowledge and build the tools to address this dilemma.

To help find a solution to this entanglement dilemma we need to look at what today's most pressing and polarising issues have in common. Most of these topics divide society because in addition to challenging belief systems, the outcomes or solutions have winners and losers. Unlike an area of science, like space discovery, the implications of climate change or water resources for example could mean job cuts, heightened regulatory conditions, higher taxes, etc.

This is where science, incentives and beliefs intersect. Unless we acknowledge incentives and beliefs early, we risk polarising people and driving a culture which diminishes evidence over beliefs.

Scientists have traditionally seen their role as just presenting the facts, and letting politicians, industry and the public deal with the values.

The problem is that the “losers” will fight the science and easily conflate with those whose belief systems are unaligned. Together, they have an enormous incentive to double back on the science and undermine its credibility.

Though easier said than done, we need to consider how we influence these beliefs from the start. This means talking through issues and outcomes with industry, government and the public early on, and involving

experts from various disciplines, such as the arts, humanities and social science.
I believe CRCs are exceedingly well positioned to play an important role in bringing values into the equation early. They already engage with industry, academia and government. Working with experts who understand beliefs, and can help bring society along as they progress their field, is not an impossible task.

I think this is what Prof Kahan had in mind when he concluded

"The science communication paradox — the simultaneous increase in knowledge and conflict over what's known — is built into the constitution of the liberal republic of science".

And let me loop back to that that graduation speech President Kennedy gave at Yale. He was addressing the topic of a communication paradox. It was the challenge of myths and perceptions that he felt was adversely impacting on the decision-making process in a liberal

democracy. He likely did not ever imagine that topic would be science itself.

To conclude, we must recognise that the advancement of science in society requires successful communication. Science as a media genre has special challenges, and the reshaping of the media industry has compounded these problems.

The climate change debate has shown us that where science involves a major issue in society its communication challenges like any other societal issue may be impacted by long held beliefs, which can be highly subjective and polarizing when enmeshed with economic winners and losers.

I ask for your support for the science communication entities that are successfully addressing those challenges, and urge you to engage with them in new ways, ways that might feel uncomfortable.

If we consider the sheer number of scientists, technologists, engineers and mathematicians in our midst- there is a mighty force present within our society who can advocate and communicate. Keep pushing the boundaries and innovating new solutions.

I suspect that there were many times that Professor Slatyer felt uncomfortable as he advocated for three pillars of society; university, government and business, to come together to create a better future for our nation through a knowledge economy.

Perhaps we now know why he had less success with advocating for policies addressing climate change and nuclear storage. But I'd argue that he more than made up for it by turning the shared challenges between science and society into an opportunity to help both thrive together - by pioneering our all-important CRCs. Now, it's up to us,.whether we are scientists, engineers, business persons or government agencies
Thank you.