



**Australian Government**  

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**Chief Scientist**

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**Science Meets Parliament 2018**

**Opening Address**

***Evidence and integrity***

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**National Gallery of Australia  
CANBERRA**

We're in Canberra. You're about to meet a lot of politicians. So let me start with an opinion poll.

Hands up anyone who regards Isaac Newton as a personal hero.

Isaac Newton was not just one of the greatest scientists of all time. He was also a Member of Parliament.

It's true: he served two terms as the Member for the University of Cambridge.

Legend has it that he spoke in the House of Commons on only one occasion: when he asked for a window to be closed.

There you have it: you can write down the Laws of Motion, and have nothing to say on laws or motions in Parliament at all.

That's not to say that Isaac Newton wasn't political. On the contrary: he was highly political. He reigned supreme as President of the Royal Society for an uninterrupted 24 years.

That's longer than the last six Chief Scientists of Australia put together.

His term only ended when he was buried in Westminster Abbey.

So yes, Isaac Newton was good at politics.

But he didn't see Parliament as a forum for advancing science. That's just the way it was in the seventeenth century.

If you wanted money, you wrote to the King. If you wanted to cut up corpses, you made friends with the local hangman. If you wanted to make a better telescope, like Isaac Newton, you just ground the mirrors yourself.

So science and Parliament could be casual acquaintances: a few shared interests, a bit of shared history, nothing more.

That's all changed.

Now, science and Parliament meet as an old married couple: each reliant on the other.

And every scientist knows it – because we've written grant applications. But let me emphasise just how fundamental this relationship is to everything we do.

Beyond the money. Beyond laws and regulations. Beyond the tax incentives. Beyond the schools and TAFEs and universities. Beyond them all, we share a purpose.

Science needs Parliament to understand its place in the national mission.

And Parliament needs science to forge an Australian identity: to give us courage, ambition and pride.

You could, in theory, run a country without reference to science. And you could run science without any organised support from the country.

But we tried that. We called it the Middle Ages.

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People tell me that 2017 was a terrible year: the worst year on record.

Really? I look back, and I see that gravitational wave detection has opened our eyes beyond the electromagnetic spectrum. For the first time in the history of mankind we can feel the universe in addition to seeing it!

Immunotherapies are opening a new battlefield against cancer!

We can sequence the genomes of ancient humans from DNA extracted from skeletons more than 10,000 years old!

We can sequence *your* genome for about \$1000. That's one *ten thousandth* of the price just a decade ago!

Space telescopes are detecting exoplanets!

Scientists have devised an atomic clock small enough to fit on a chip in a smartphone!

Elon Musk has just fired a Tesla Roadster on a billion year voyage into space!

And if none of these things make you leap up from your chair with the joy of being a human being alive today, look around the world! Look at the reality of scientific progress!

The proportion of children who die before the age of five has halved since 1998.

The number of measles cases has plummeted by a factor of six since the year 2000.

In your pocket, you have a device that combines the genius of OLED touch screens, artificial intelligence and machine learning. Your personal atomic clock is on the way.

Every one of the above is a result of *decades* of scientific research.

Funded by government, undertaken by scientists.

Science met Parliament, and the offspring was progress.

And its sibling is potential.

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So. The big question. The State of the Union.

I would say, like all relationships, it needs work – and sometimes, it can benefit from counselling.

If Science and Parliament walked into my office, and asked for my advice, as a person who talks to both scientists and politicians... I would say four things.

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**First: to the scientists – the same rules and standards you apply to every other part of your professional life apply here as well.**

We are scrupulous about those standards amongst our academic peers, because the scientific method is printed on the inside of our eyelids.

It reduces to two things.

Hypothesis, and evidence.

The best science has both: hypothesis and evidence.

Hypothesis alone is a good start.

Evidence alone is a good start.

When they are both absent, it's not science.

When they are both present, it's brilliant science.

That's how science delivers the goods, and why it's worthy of confidence and respect.

That's the standard for a scientist in the conduct of research. It's the standard for a scientist advising politicians on policy in Canberra. It's the high bar.

Other people who speak to politicians will over-promise, gloss over the risks, under-state the costs, or try to play multiple people against each other in various cunning ways.

That's their game: and sometimes, it probably works.

That doesn't mean we scientists can afford to do the same, to lower the bar.

No: a low-bar scientist is not a scientist!

I promise: the politicians you meet will welcome you with genuine interest, enthusiasm, and respect.

Now be aware, they will be guided by factors beyond scientific evidence. But that's exactly as it should be.

It doesn't mean that they expect less of you.

They trust *us* to clear the high bar. *We* need to ensure their trust in the strength and potency of the scientific method we represent.

To ensure their trust, we must be vigorous as a community to maximise the quality of published science.

We are ambassadors.

Every scientist needs to uphold the collective credibility of science by absolute integrity in all our dealings with the media, the community and politicians.

Integrity means don't exaggerate.

Integrity means share the bad as well as the good.

Integrity means don't trivialize.

I know you take this responsibility seriously. I try to keep it uppermost in my mind.

So, first principle for a happy marriage: be true to the highest standards of the profession.

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## **Second, to scientists and politicians: you're in it for the long haul.**

For better, for worse, for richer for poorer, you're in it together. Look beyond the here and now to the things that endure.

The impression you get from the media is that politics is a B-grade movie: bad dialogue, all violence, no plot.

But the science that politicians see on the television is equally superficial.

They see the highlights: discoveries and breakthroughs and prizes.

You know the reality: there's a context, and a logic, and lot of work.

The same is true of Parliament.

Connections in Canberra are enduring, and relationships count. The MP you meet today through a committee could be a minister in five years' time. A junior public servant will be a senior public servant.

Beyond the people, there are practices: protocols, conventions, expectations and rules.

And there are patterns. The political seasons in Canberra are as rhythmic as summer to autumn, winter to spring. Autumn leaves: it's Budget. Spring blossoms: Parliament returns.

If you know the patterns, you can till the ground, plant the seed and grow the flowers.

It would be fascinating to see how many projects have bloomed through all the years of Science Meets Parliament.

Perhaps you're attracted to a career in policy but would like to test the waters. In that case, consider an application to a new scheme established by my office.

This year, for the first time, we opened a Science Policy Fellowships program: offering a full year's experience working directly in government departments, here in Canberra.

12 mid-career scientists starting in July will take a year off from their research to work in a science policy role with one of seven Commonwealth departments.

Application will open again towards the end of 2018. Keep it in mind.

But even if you're not in Canberra to stay, think about that advice: for a happy marriage, take the long view.

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### **Third piece of advice, communication is key.**

The secret of good communication is to keep your audience in mind.

I say this in some academic forums and people recoil: science is independent!

Yes, science is independent of bias and coercion and self-interest and partisanship.

See Rule 1 above, integrity and rigour are non-negotiable!

But communication is not independent of the audience.

Otherwise, it's not communication, it's just content.

Thinking of your audience doesn't mean changing the content to suit the other person's worldview.

It means explaining where the content fits, in the context of the goals you share.

Start not with "I want" but with "we can help each other to achieve".

Ignore anyone who tells you that politicians or people in general are incapable of absorbing complex ideas. Not true: they can and they do.

Here's my proof: the topic of precision medicine.

To date, that phrase has never been spoken on the floor of the Parliament.

Search Hansard, the written record: you won't find it.

But there's a golden opportunity for all politicians: be the first! The first to use in Parliament a term that transforms our understanding of health: and adds years, maybe decades, to our lives.

The idea at the core of precision medicine is simple, and compelling.

*Healthcare should be optimised to the individual.* Tailored to you: based on your own gene sequence and your own medical and health records, taking advantage of every insight we can glean from a world awash in data.

Innovation and Science Australia has laid down the challenge in the 2030 Plan: let's make this ambition of custom-made twenty-first century care, for everyone, a defining National Mission.

That means more than knowing the term: it means mastering the concept in depth.

The Ministers who sign off on the decisions need to be confident that their judgment is sound.

How confident?

How confident would *you* want to be before you tried to restructure the healthcare system in real time, with real patients, real families, real consequences?

You'd want to be very confident.

The Australian genomics community has worked incredibly hard to bring politicians to that point.

First, by coming together in the Australian Genomics Health Alliance.

Second, by explaining the potential through the stories of patients.

And third, by making space for the policy discussion.

I've been proud to be associated with that process.

As you may know, I am Executive Officer of the Commonwealth Science Council – the body chaired by the Prime Minister.

Last year, the Commonwealth Science Council identified precision medicine as a critical issue.

I commissioned the Australian Council of Learned Academies, ACOLA, to prepare a report drawing on the skills of the learned academies.

The Department of Health declared itself to be interested. Knowing this helped ACOLA to decide the context of its analysis.

Not only was the report rigorous and independent, but equally important, it was relevant.

That report was launched last month by Minister for Health Greg Hunt.

As a model of academic communication – independent expert to political decision-maker – you can't do better.

The report challenges its audience to grapple with difficult questions but it gives them the tools.

And the conversation doesn't end with the report. The report frames the discussions to come.

The same approach will be used again in coming months, with horizon scanning reports on synthetic biology, artificial intelligence and the internet of things underway.

So number three: communication is key.

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**And that brings me to my final piece of advice for a happy marriage: keep up the maintenance and renovations.**

It happens in every marriage.

The carpets need replacing.

There are too many kids: we need a new bedroom.

The tap in the bathroom leaks.

It's got to be done: it just has to be prioritised.

The conversation about national research infrastructure often runs the same way.

We know: if you neglect it gets more expensive.

If you manage it job by job, without a plan, you spend more money on things you're not completely sure you want.

And, of course, if you can't agree, you don't get anything done at all.

The way to get things done is to identify the priorities and plan the investments.

Over the past two years the research community has come together to present government with a roadmap for our national research infrastructure.

I was proud to lead that process, and I am working closely with the Department of Industry, Innovation and Science, and the Department of Education to translate the roadmap into an investment plan.

I would say to science and Parliament: this is a priority.

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So, there's my four pieces of advice:

One, rigour and integrity in everything we do.

Two, remember that we're in it for the long haul.

Three, communication is key.

And four, keep up the maintenance and renovations.

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Enjoy your time in Canberra.

And one parting shot: a three word slogan that every politician can borrow:

*Science is fantastic.*

Let's make this a meeting that no one could forget.

**THANK YOU**