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Science Meets Parliament

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Opening remarks

It's a humbling experience to deliver a speech to an audience made up of many of Australia's best scientific minds.

As a person of Greek heritage, I'm proud of the contribution of Socrates, Aristotle, Plato, Archimedes and other classical Greek thinkers to the development of the scientific method.

The scientific method has been essential to the evolution of Western society.

It's a privilege to be the Minister responsible for science – and one of your principal advocates in the community.

Science Meets Parliament is a great event. It's about recognising the invaluable contribution of Australian scientists to this, the best country in the world.

Scientists and parliamentarians must collaborate. By drawing on scientific rigour and expertise, we have the best chance to solve seemingly intractable economic and social problems.

Science has been – and is – crucial to shaping our nation's destiny.

But in my first two months as Minister for Industry, Innovation and Science, one of the questions I've been hearing quite often is this: why should Australians care about science and innovation?

Background: why are innovation and science relevant?

Some people – inside and outside politics – have been questioning the Government's focus on innovation and science: in particular, that 'innovation' has become a buzzword that excites socially mobile, inner-city types; but for other Australians, creates anxiety – about job losses and insecurity.

And increasingly, there has emerged a lack of respect for the scientific method in some quarters. We see the conclusions of experts being cast aside, in favour of ideological positions and selective use of facts.

Denying the threat of climate change is a well-worn example; however, rejecting vaccinations – at the risk of children's lives and public health – resurfaced just this month.

The only credible response to these positions is scientific fact. And more research, and more innovative thinking.

This is why innovation and science are more important than ever.

As the portfolio minister, I'm responsible for strengthening our commitments in these areas.

Collaboration – between researchers, industry and government – is a particular focus of mine; and I want to share with you some of those plans and initiatives underway.

But the other crucial part of my job is to explain why investment in these areas is essential – to show every Australian how innovation and science can help to change all our lives for the better, and to use case studies to illustrate this change.

Eras are so often defined by their scientific advances – and in turn, science is defined by the challenges of the day. Think of the 60s, and you think of man walking on the moon – an image that can't be separated from the Cold War and the Space Race.

Science doesn't exist in a vacuum, so it's worth taking a moment to consider the context surrounding science in Australia today.

To that end, I'd like to start by reflecting on our current economic setting: to define the challenges we all face; and explore the reason why, no matter what industry we work in, innovation and science are indispensable tools in overcoming those challenges.

Our economic challenge

When Donald Horne issued his wake-up call to Australia through his book *The Lucky Country*, I was a young boy growing up in 1960s Newcastle.

The irony of the book's title will have been lost blissfully on a city bustling with industrial activity.

The towering chimneys of the Newcastle steelworks signalled jobs, wealth and the reign of heavy industry.

But economies change, at the behest of many complex forces. We all have some experience of this. It was certainly true of my home town, and other regions and sectors throughout the country.

The decades that followed proved economically challenging for traditional industries, under the weight of technology, globalisation and the rise of new economic powers.

And by the time the steelworks closed in 1999, Australia was a very different place.

Sweeping economic reforms from the 1980s – encompassing competition, taxation and workplace relations – laid the foundations for a more diversified, flexible economy and new prosperity.

I saw first-hand how that newfound flexibility let us navigate our way through the Asian financial crisis of the 1990s.

It also served us well as the economy digested the biggest terms of trade boom in our history without the boom-busts of previous eras.

But our recent prosperity has also rested on our STEM professionals – the people working in science, technology, engineering and maths. They've driven innovation in our successful resources and agriculture industries, and they're supporting restructuring and specialisation in regions like Newcastle and Wollongong.

Being match-fit allowed us to take advantage of the burgeoning opportunities in global trade, and to attract foreign capital.

Today, Australia is one of the world's most prosperous economies, and among the countries with the highest quality of life.

For several years, we've consistently ranked second on the UN Human Development Index on the basis of income, education and health.

We've enjoyed almost 26 years of unbroken economic growth. We've been lucky too, but we've made the most of our luck through good policies, and hard and smart work by a skilled and educated workforce.

Australia has a lot to be proud of, for sure.

Importantly, now, our enviable growth record and these solid runs on the board make me optimistic as we address our economy's new challenges:

- Managing the transition from the resources boom to more balanced, broad-based growth;
- Accelerating productivity growth, if we're to match the income growth of recent decades;
- Facilitating structural change engendered by new technologies, globalisation and trade;
- And all this against the backdrop of mediocre global growth and heightened uncertainty.

The outcome of the US presidential election and the Brexit vote partly reflect discomfort with the economic impacts of globalisation – and a yearning for more protectionist measures.

We now have to navigate another big shift. It's the world's fourth industrial revolution.

Why innovation and science matter

So what does that mean for all of us? It means that disruption is the new constant. Some old ways of doing things are becoming uncompetitive and obsolete.

Disruption and change are inevitable – here and across the global marketplace. Either we acknowledge the change, or we risk being overwhelmed and disadvantaged by it. Our job as a nation is to embrace change, and derive the greatest benefits we can.

Governments cannot turn back the tide of change or mandate existing market structures.

We're part of a global marketplace. Our competitors overseas are not waiting for us to change. As consumers, we have more options than ever before – we're more informed and assertive than ever.

These are the big structural changes that are affecting the whole community.

Recently I read some comments by the Atlassian co-founder Mike Cannon-Brookes, where he said the Government was dodging the question of job-losses as a result of innovative change.

I don't think we are. From when Malcolm Turnbull became Prime Minister, we started a conversation about Australia's future to address that exact question.

Through our innovation policies, we want to *keep* Australians in gainful, well-paid jobs. That's what this Government's policies are all about. They're about helping your business and your industry to *respond* to disruption in the market, and to stay viable in the future.

They're about creating an innovation mindset across all sectors of the economy – traditional and non-traditional. A cultural change that outlasts any minister or any government.

It's really important that we talk about innovation openly, clearly and often.

Where the economic impact of a shift has been significant and jobs are at risk, the Government responds with targeted assistance. We've provided a range of support for business and workers in the auto industry, for example. This gives me real optimism about the future of advanced manufacturing in Australia.

Earlier this month, I was in Adelaide visiting a company called Blown Plastics. Their main business model used to be making plastic parts for Australian cars.

The Federal Government gave them a grant of over \$830,000. They used that money to develop their manufacturing processes and expand their business into making complex parts for medical devices.

With our assistance and their entrepreneurship, they're continuing to operate. They're now an innovative and flourishing business. Blown Plastics has protected the jobs of its many Adelaide employees and successfully carved out a bright future. It's giving hope to those who work there: they have a place in the new global economy.

We know from work coming out of my department that firms like Blown Plastics – firms that compete on the global market, that export – created nearly 25 per cent more jobs over the last decade than firms that did not – and paid higher wages.

So structural change can be a positive. With the right mindset and support, businesses can use it to evolve, become more competitive and resilient, and safeguard job security for their workers.

As always, science, research and people with new ideas are at the centre and foundation of this transition.

I see my portfolio very much at the forefront of this work. Science is the backbone of new-to-market innovation; and both science and innovation are inextricably linked with industry.

Collaboration

Collaboration – bringing together research, ideas and entrepreneurship – this is what I really want to become the hallmark of my efforts in the portfolio. I really want to nail this issue.

It ties together everything we do in the research and innovation spaces. It uses industry links to commercialise what we do.

But it's also an issue in the portfolio that requires work.

The recent performance review by Innovation and Science Australia found that Australia has strong rates of collaboration between researchers; but that there's plenty of room to improve collaboration between research and business.

We need to take a longer-term view, take more risks and learn from failure. We can only do that by collaborating to translate our publicly funded research into real products.

This was not news to any of us. In the well-known 2012 OECD ranking, Australia ranked the lowest out of 27 countries on collaboration between researchers and innovative businesses.

So there's work to do. It's why collaboration is a focus of our Innovation Agenda.

We have some great examples of collaboration between researchers, business and government. It's produced some of our most notable scientific advances – from the cochlear implant to wi-fi to polymer banknotes.

Extended-wear contact lenses were developed through a partnership between CSIRO and two global pharmaceutical companies, under the Federal Government's Collaborative Research Centre for Eye Research and Technology. It resulted in a product now used by countless people, the world over.

These exemplars of collaborative practice should be the gold standard of everyday research. Collaboration needs to be how we naturally operate.

I see the culture of organisations and collectives as fundamental to nurturing an attitude of collaboration. More open source than proprietary, if I can put it that way.

We're already making this happen – and not just with big business, but with small and medium enterprises too.

We're helping SMEs collaborate locally and globally – through programmes like the Business Research and Innovation Initiative, the Entrepreneurs Programme, the Global Connections Fund – the list goes on.

Government as an exemplar

Another issue in the portfolio that's really important to me is that we in Government lead by example.

The Government needs to be an exemplar in the way we invest in innovation and science – and in how we use digital technology and data to deliver better information and services.

In the spirit of Science Meets Parliament, I'd like to focus today on how we're leading by example in science.

One of the most important things we're doing, in my view, is by doing something that sounds quite simple – but it's of the utmost importance, and it's often overlooked.

We are respecting the unique role of science in policy-making.

To everyone in the science community, I say this.

As science minister, I don't take you for granted. I respect what you do. I respect the scientific method and evidence-based policy-making.

Now more than ever, to make informed decisions, you must rely on expert advice, especially from scientists.

Earlier this month, I heard the Chair of Universities Australia, Professor Barney Glover, speaking here at the Press Club, appealing to Australians to respect the value of evidence and expertise.

I couldn't agree more.

I want to see science, research and empiricism at the core of the mission of government. I want to see it integrated in policies across the whole of government. And I want to see it at the forefront of knowledge creation for the new economy.

Part of my role is to celebrate the achievements of the extraordinary scientists right here on our shores.

We have exceptional scientific and educational institutions.

They are the engine room of new knowledge and innovation. They're using state-of-the-art research infrastructure, and they're generating ideas that can be put to work and make a difference to our lives. They're the precursor to better jobs and higher living standards for so many Australians.

They've produced notable scientists – from our very first Australian of the Year, Sir Macfarlane Burnet, to the latest, Professor Alan Mackay-Sim, and ten others in between.

They've produced several Nobel Prize winners, Professor Brian Schmidt the most recent.

As Minister, I commit my full support to our science community – and the proof for that commitment is in our National Science Statement, which I'm releasing today.

The Science Statement

The Science Statement provides an enduring framework to guide our decisions on what we need and what we want from science.

In a nutshell, the Statement sets out our long-term vision for Australia: a society that is fully engaged with science, and fully enriched by science.

We need people with highly specialised skills to keep producing high quality basic and applied research.

The Science Statement reminds us that the ultimate goal of science is to change the way we live: to support the nation's wellbeing, improve our health, build a more productive economy, and sustain our natural environment.

And we also need to create a citizenry that is scientifically literate to participate as informed members of society.

Outcomes in Science

The Science Statement emphasises that science is a long-term investment.

We in Government like to focus on outcomes – we like to assign KPIs and quantify exactly what we're getting for our money.

When it comes to science, it's vital that we support research for its *own* sake.

This is because we can't presume to know the outcomes of scientific endeavour. Proving or disproving hypotheses takes time. We often have to wait to see where it takes us.

And, importantly, whether or not a particular piece of research delivers a breakthrough does not determine its worth. Every inquiry builds on our body of knowledge and brings us closer to the next great discovery.

That's why we support the full range of research: from basic to applied.

It's why we rely on robust competitive mechanisms and peer review to determine what research is funded, drawing on expert advice.

Supporting science infrastructure

And it's why we must ensure that our scientists have access to the best research infrastructure in the world – so they have the best possible opportunity to undertake high-quality, world-leading research here in Australia, and so that they are preferred partners in international collaborations.

We understand that big science requires global collaboration, like our participation in the world's largest ever radio astronomy project, the Square Kilometre Array, for which our funding contribution of \$294 million is now secured.

Our \$10.1 billion annual investment in the science, research and innovation system is already supporting an incredibly diverse range of activities, some with great results.

We've also put the National Collaborative Research Infrastructure Strategy on a long-term stable footing by providing ten years of operational funding through the Innovation and Science Agenda.

In the nuclear science field, we've taken ownership of the Australian Synchrotron and, likewise, stabilised its operational funding – with half a billion dollars committed over the next ten years. And we're already seeing the results.

Using the Synchrotron, researchers from the Walter and Eliza Hall Institute have developed a drug, venetoclax, that effectively 'melts away' certain advanced forms of chronic leukaemia with very promising results.

Research and innovation in medical science isn't just improving lives; it's saving them.

Commercialisation solutions through NISA

The scientific community is a critical contributor to the new Australian economy. It drives our traditional sectors to be smarter and more competitive – on and off shore.

The \$1.1 billion National Innovation and Science Agenda – or NISA – has addressed these challenges head-on.

Almost all of the original measures have now been implemented. One of my priorities is to build on the agenda and its original measures to cement an innovation mindset and global outlook.

NISA is driving the translation and commercialisation of our strong research output. Witness the \$500 million Biomedical Translation Fund and the \$200 million CSIRO Innovation Fund.

Through NISA we've expanded the Innovation Connections element of the Entrepreneurs' Programme, as a valuable source of advice to business.

Expert advice and research make a significant difference to what a business can achieve.

Karen Sheldon Catering, a Darwin based company, has teamed up with researchers from The University of Queensland on a project to extend the shelf life of food. They're using natural additives and native plant extracts to replace artificial preservatives. For example, Kakadu plums could extend the shelf life of frozen foods by up to two years!

Rarely do emerging businesses have the resources to make that sort of breakthrough on their own. Through our Innovation Connections programme, the company got the right researchers to help.

NISA has also provided opportunities for collaboration beyond our shores.

We've recently signed agreements with New Zealand to develop a Trans-Tasman innovation ecosystem, and with Japan, Singapore and Israel to help Australia deepen our innovation collaboration.

This year, we're building on our NISA achievements through a systematic and strategic set of announcements.

- The Science Statement sets out the principles we're working with – our long-term commitment to the science community.

- The National Research Infrastructure Roadmap will lay out our way forward over the next decade in giving our researchers access to the best research infrastructure in the world.
- And to inform our priority setting and resource allocation, we've tasked Innovation and Science Australia to develop the 2030 Strategic Plan. They'll deliver the plan later this year and identify the areas that need most work.

Other departments across government are complementing the work we're doing.

- Defence procurement, for example, has a strong innovative focus, incorporating the best of high-tech Australian research.
- Science and innovation hold the solutions to our energy policy equation, and they're vital to what we're doing in that space at the moment.
- And of course, our work in the innovation space extends to service delivery throughout government, led by the Digital Transformation Agency.

Every year, I intend to report to the Parliament on the outcomes of the Innovation and Science Agenda across government.

Growing strong, innovative and self-reliant businesses is not solely a function of programmes in my portfolio, but it also depends on appropriate macroeconomic settings – and policies in areas like tax, competition policy, regulation, education and training, workplace relations, energy and trade.

We don't always know where the industries of tomorrow might come from. But we do know that a culture that supports innovation and collaboration will secure jobs and prosperity in a changing global environment.

Building capability

We also know that up to 75% of jobs in the fastest growing industries will require workers with skills in the STEM areas.

And all the collaboration in the world won't help us if we can't build and maintain our own capability.

A big part of achieving that goal has been to address inequality in science education, participation and employment.

We've already started investing in these areas to inspire all Australians to engage – from pre-schoolers to the broader community.

Through the Science Statement, we're committed to tackling the under-representation of particular groups in STEM – among them, women, Indigenous Australians and those in regional communities.

I was in Melbourne last month when the Alibaba founder Jack Ma opened their Australia/New Zealand office. Jack spoke with great conviction about the importance of young people and women as the two leading drivers of entrepreneurship in the future.

There's so much we can do to bring these future entrepreneurs into the STEM fold. Often, the journey starts at school.

I was concerned to read about the Curriculum Authority's national report card last week that found only 55% of Australian Year Six students are proficient in science.

I'm a great supporter in this context of the work of Questacon in exciting young minds to the possibilities of science and technology.

Taking science to young Australians in the classroom and online can be incredibly powerful and inspiring, and it's a strong first step towards overcoming inequality in participation.

One great business we've supported is Science Alert – an online service based in south-western Sydney that's bringing science news to young Australians. With a \$200,000 grant, they're reaching three to four million Australians every week over social media, and now they're employing several full-time and part-time staff.

Under NISA, we're improving STEM career opportunities for women through a number of important initiatives, including the SAGE programme and the Women in STEM and Entrepreneurship initiative.

For my part, I recently announced a Women's Advisory Roundtable in industry, innovation and science.

It will ensure that women's insights and ideas are influencing and informing our decision-making, encouraging more successful female innovators.

Conclusion

In conclusion, we're doing much to tackle the big challenges of our transitioning economy, and it's been great to share some of that with you this afternoon. I'm really keen to work with all of you to create a world-leading science and innovation culture.

Donald Home's wake-up call for Australia is as relevant today as it was when I was growing up in Newcastle half a century ago.

When I go back to Newcastle these days, as the patron Senator for the region, I'm still astounded at how much has changed.

When the steelworks shut its doors in 1999, many people said it would spell the end for Newcastle.

Now, it's a thriving innovation hub, an exemplar of smart specialisation, and a centre of collaboration between education, research, government and industry.

A strong regional university in Newcastle Uni has made headlines in its own right: engaging in world-leading research; partnering with innovative small and medium-sized enterprises; and inspiring generations of highly skilled entrepreneurs.

We want to create a perpetual culture of collaboration right around the country – in cities and regions alike.

Programmes like Science Meets Parliament play a vital role in this regard. I thank Science and Technology Australia for your leadership in this tremendous undertaking – bringing people and ideas together every year for the last eighteen years.

Kylie Walker, the CEO, and Professor Jim Piper, the President, are in the audience today.

I want to help every Australian understand that no matter what industry you're in, and no matter what our domestic policy settings are, the forces of innovative change will affect all of us. By planning ahead and investing in scientific research and product development, we are not only responding to change, but we are seeking to *create* change – change that is to our benefit.

Our science and innovation policies are about keeping Australians in secure, long-term, well-paid jobs, ready to respond to global forces and shifts.

We have world-class scientists, skilled and tenacious innovators, and a Government leading by example.

I'm thrilled to be working with you in this important portfolio; and I look forward to us breaking new ground together in the years ahead.