Australian Government

Chief Scientist

PROFESSOR IAN CHUBB AC

OPENING ADDRESS TO THE AUSTRALIAN CITIZEN SCIENCE CONFERENCE

23 July 2015

Shine Dome,

Canberra

People have always been curious about the world around them.

Take Charles Darwin.

As a young man he was sent to medical school in Scotland by his father. He found it boring and unpleasant, so he took to studying the anatomy of marine invertebrates instead.

That annoyed his father, who packed him off to Cambridge to become a clergyman.

This was boring, too, but it left Darwin with plenty of time for what he actually wanted to do – which was wander up and down the fens collecting beetles.

Based in part on his beetle collection, but more broadly on his remarkable gift for observation, his tutor recommended him for the *HMS Beagle* as a ‘gentleman scholar’.

He couldn’t come billed as a ‘scientist’, because the word hadn’t yet been invented.

Right up to the 1920s the journal *Nature* refused to use it, because it was thought to be firstly too American, and secondly too similar to ‘economist’.

But in Darwin’s day, the idea that science could be your profession as well as your passion was still emerging.

And Darwin found knowledge and insight in many quarters – not just in the community of gentleman scholars.

He spoke to farmers and pigeon fanciers about selective breeding. He roped in three generations of his family, along with his butler, to join in his projects and prepare his notes.

His last published book was titled *The Formation of Vegetable Mould through the Action of Worms*.

At a dinner party he was asked how he could devote his time to such an insignificant subject, as a scholar whose name was known across the world.

Darwin replied, “I have been studying their habits for forty years”.

He knew that wonder could be found in the humblest things.

Science is no less awesome today

Many things have changed since Darwin’s beetle-collecting days.

We can do calculations in a matter of seconds that the best mathematicians in Darwin’s day would take months to complete.

We can photograph the things that Darwin could only draw, or describe.

We can build colossal datasets and share them round the world in an instant – where Darwin had only ledgers, stored in libraries.

And we can do all of those things on a device that you probably have in your pocket right now.

But the same spark is there – the spark that sent Darwin to the compost heap for earthworms, just as it surely as it took him to the Galapagos on the *Beagle*.

It is the hunger to know – the joy in a problem solved – and the passion to see the world in different ways.

Of course there are many ways to be curious.

But science is the way we translate our curiosity and creativity into knowledge – knowledge that we can test, refine and apply, in a global community of practice.

It teaches us many skills:

- Framing problems
- Articulating ideas
- Working in teams
- Weighing evidence

And it draws out many fine attributes:

- Resilience
- Rigor
- Integrity
- Imagination

It is awesome, as well as awesomely important.

So it is a great tragedy that so many Australians – too many Australians - think science is boring, unnecessary, or hard.

We see it in schools: participation in science subjects at senior levels in schools is the lowest it has been in 20 years.[1]

We see it in our approach to industry: just two in five of our businesses describe themselves as 'innovators', one in five say they introduced new or at least significantly improved goods or services, and one in fifty can point to a new-to-market innovation.[2]

[1] Kennedy, Lyons and Quinn, *The continuing decline of mathematics and science in Australian high schools*, Teaching Science, Volume 60, Number 2, June 2014.
[2] http://www.industry.gov.au/innovation/reportsandstudies/Documents/Australian-Innovation-System-Report-2014.pdf.

Our patenting rate is poor, and our record on business-research collaboration is among the worst in the OECD.

We also see it in our society: when we come to big debates on the hard questions – like climate change, like global pandemics, like resource scarcity – and we struggle to integrate scientific evidence into a respectful conversation.

And all of these things are odds with our perception of ourselves as a capable and curious country – doing for ourselves the things that only we can do, and collaborating with the best in the world as respected partners.

Moving science back to the centre of national life

Of course, we don't all have to be scientists.

We *do* need to be comfortable living in a world that relies utterly on the things that scientists do.

We ought to interested, and we ought to be informed.

And we ought to know at least enough about science to grasp how it works, and think about what we want it to achieve.

Citizen science is a vital part of the puzzle, enriching our community on every level.

- It contributes scientific evidence that would not be possible without people's time, local knowledge and resources.
- It brings people of all ages into contact with working scientists, so we can teach and learn from each other.
- It builds an evidence base that communities can apply, more intelligently and proactively because they were part of its collection.

In all these ways, it makes us a stronger community and a better nation.

Like many things that we do in science, it would benefit from more planning and coordination.

There are many examples of fruitful collaboration – but how many *more* could there be, if;

- scientists were trained and encouraged to work with the community;
- communities themselves were informed on scientific opportunities and practice; and
- all of us worked together to share knowledge, resources and skills?

Which Australian *couldn't* find a science project that excited them, engaged them or benefitted them, and contributed to our understanding in turn?

130,000 Australians in 90 projects is an excellent beginning.

That means there are only 23,700,000 Australians to go.

It is important work and I am pleased to be a part of it.

Congratulations to the Australian Citizen Science Association on this inaugural national conference.

My particular thanks to the members of the Association who authored the Citizen Science Occasional paper we release today.

I hope it will catch the imagination of the many people who stand to benefit from the actions this forum will discuss.

After all – you never know where beetles and earthworms can lead.