

Good evening!

I'm honoured by the opportunity to share a few thoughts with you on what is a very important milestone in your lives. My message to you this evening is a simple one. The many challenges confronting the world right now seem more daunting than I can recall at any time in my adult life. However, the opportunities are also tremendous - and as new graduates, you are equipped with the skills to make a positive contribution to a better world.

Allow me to elaborate on each of the three parts in this message, starting with the challenges.

Economists always want to see growth - but we live on a planet with finite resources, and increasingly the growth we see is testing the limits of sustainability. The current population of 7.5 billion is projected to reach around 10 billion by 2050. That means in just 33 years we can anticipate the need for 33% more food, clothing, accommodation and employment - in fact, a lot more if we hope to raise the standard of living in the most under-developed regions of world. The pressure that this creates is taking it toll on every aspect of life.

The modern world's appetite for energy continues to grow, and three quarters of it is still generated by burning fossil fuels - contributing to the rise in greenhouse gases. At the same time, we continue to chop down the world's forests at the rate of about 36 football fields every single minute, thereby weakening the planet's ability to absorb carbon dioxide. A majority of the world's scientists believe that the blanketing effect of greenhouse gasses is contributing to the well-documented rise in global temperatures - with the risk of reaching crucial tipping points where positive feedback loops kick in and dramatically exacerbate the process. As the temperature increases, weather systems gain more energy - leading to the weather extremes that we now see so regularly in the evening news.

Extinction is a natural phenomenon and part of the evolutionary cycle. Estimates vary, but there is a general consensus that the rate at which species are currently vanishing is running orders of magnitude above the "background level" - in large measure due to the spread of feral species and the destruction of habitat.

Pressure on the world's resources doesn't just impact our environment - the socio-economic consequences equally troubling. The richest and most powerful commonly exploit their influence to entrench and grow their wealth at the expense of the weakest in society. In a report released in January this year¹, Oxfam estimated that since 2015, the richest 1% have owned more wealth than the remaining 99% of the world's population. Even more startling, the world's wealthiest eight individuals own as much as the bottom half of the world's inhabitants combined - and the gap between rich and poor is widening.

Poverty fuels desperation, and this flows through to increasing crime, social polarisation and violence. People are attracted to ideologies that denounce the things they fear and deplore, and that hold out the promise of a better future through revolutionary change. I believe this is a major factor in the growth of intolerance, extremism and terrorism.

¹ https://www.oxfam.org/sites/www.oxfam.org/files/file_attachments/bp-economy-for-99-percent-160117-summ-en.pdf

The times in which we are living are coming to be characterised as the "post truth" era - where beliefs are formed *not* on the basis of facts, but rather on the basis of what appeals to the emotions. Social media applications tend to turbo-charge the process by feeding users with a concentrated diet of information that is calculated to please, irrespective of its veracity.

The pressure of our modern world is also taking its toll at an individual level, contributing to fear, isolation, uncertainty, insecurity and self-destructive behaviours. More people, including many young people, are grappling with depression, low self-esteem and periods of mental ill-health. Little smiley faces are scattered liberally through the content I see each day - but fewer and fewer of the people I meet on the street seem capable of returning a real smile.

That's a pretty bleak introduction - so let me turn to the opportunities to start balancing the ledger.

The contribution that the science, technology, engineering and maths disciplines have made to the world is almost always under-estimated. Without these disciplines, you wouldn't have arrived here using motorised transport and we wouldn't be meeting in a magnificent building such as this. The Internet wouldn't exist, we would all be dying younger in the absence of medical research and breakthroughs. Even the simplest things like the seats on which you are sitting are products of these disciplines.

The progress of civilisation may have caused many of the challenges I outlined before - but the same intellects which drove that progress can provide the keys to meeting the challenges we now face. A few folk may favour winding the clock backwards and reverting to more primitive lifestyles of the past, but that's not a practical option. We need to learn from the past and tackle the challenges ahead with resolve, with creativity, by leveraging knowledge and by mustering the best skills available.

There is hope on many fronts. In my particular field - telecommunications - the advent of broadband some 20 years ago started what I believe history will look back on as the communications revolution. To illustrate, when I moved to Canberra 44 years ago, a phone line was an unaffordable luxury and long-distance phone-calls back to my family in South Australia were made from a public phone box on special occasions such as Christmas. I confess to using 5c coins rather than 10c coins in the hope that the operator wouldn't notice the difference in tone and I could get away with a half-price call! Almost 10 years passed before I was making the first data connections - using acoustic couplers over the phone line to achieve speeds like 300 bits-per-second.

Contrast that with today, where broadband data connectivity at speeds 10,000 to a million times faster are widely available and serve as a foundation for so much of what we take for granted. Instead of slow-speed data over a phone line, phone calls are now commonly a service layered over high-speed data circuits - a 180-degree inversion! Social networking, banking, shopping, health care, education, working-from-home, video entertainment, agriculture, transport - the list is endless - are all being re-invented to exploit the capabilities of modern communications and faster, cheaper processing capabilities. Some of the progress comes in identifiable waves - such as the Internet of Things. Some of it creeps up on us so gently that we can't quite remember how radically different things were in the past.

As it continues to unfold, the communications and technology revolution is creating new needs and driving demand for a next generation of skills in areas like cyber-security, the analysis of big datasets, developing smarter infrastructure and the like. More broadly, it is underpinning the transformation of almost every corner of life as we know it.

3

A similar revolution is at an early stage in the energy sector and will undoubtedly gain momentum over the next few decades. The public have embraced solar generation, with about one-in-six Australian homes now being fitted with rooftop panels - and large-scale solar and wind farms are starting to become commonplace in the landscape. As a result, a growing proportion of the energy that we use is coming from clean, green sources. Further waves of change can be expected with the proliferation of energy storage systems, electric vehicles and energy-smart appliances.

As welcome as these developments are in terms of addressing the challenge of climate change, they are also fundamentally changing the character of the grid and necessitating an end-to-end rethink about how we generate, transport, distribute, store and use electricity. We have seen a lot of recent finger-pointing and political point-scoring over the disruption that accompanies such change - but more significant in the longer term will be the creation of new jobs and rich opportunities for innovation.

No matter where you look, technological progress is transforming our world. With wise leadership, good policy and governance frameworks and applying the best of human creativity, the world can respond to the challenges ahead of us and build a future that is more sustainable, more equitable and more peaceful.

Finally, as individuals each of you can make a difference.

The flip-side of every challenge and every frustration you encounter is a golden opportunity to fix something!

Dare to develop some grand visions and have a go at implementing them. You only live once, and I meet all too many people who were always "going to" do something, but never quite mustered up the courage.

Don't be afraid of failing when you first tackle something - failure is an excellent teacher and will either give you the insights to crack the problems next time around, to devise a better approach or to maybe choose a better problem to solve.

Graduation marks your success in mastering a set of subjects - but more importantly, demonstrates your ability to absorb new knowledge and skills. In the words of Queen, don't stop now! The future is becoming ever more dynamic - and down the track, many of you will find yourself in jobs that simply can't be imagined today. That reality demands a commitment to life-long learning - whether it be through formal education, on the job training, or thoughtfully digesting the lessons that life continually presents.

You've chosen to specialise in science and technology or policy and governance areas. However, always keep in mind that the ultimate focus needs to be on people. The way that you apply your skills should be directed at creating a more sustainable world. I'm not referring just to the environmental health of our planet, but also to the social well-being of your fellow humans.

Be discerning about what are presented to you as facts. You've mastered some valuable skills in researching subjects and can apply those same skills to assessing the tide of information with which you'll be confronted daily in the media.

Let me wrap up by congratulating you all on your graduation and wishing you the very best in life as you make your mark amongst family and friends, in your workplaces and communities, and on our fragile planet. Today is not the end of your journey - it's just the beginning of a new and exciting chapter.