The Royal Society of NSW

Occasional Address delivered at the Science and Engineering Graduation Ceremony held on Friday 20 May 2011 in the Great Hall, University of Sydney by the President, Mr John Hardie

Chancellor, Deans of the Faculties of Science and Engineering, distinguished guests, ladies and gentlemen and, most especially, new graduates who have had your degrees conferred this morning.

May I add my congratulations to those of the Chancellor to each and every new graduate, who today embarks on an exciting career in either engineering or science. It is not only a significant and exciting day for you as you head out from this hallowed Great Hall but also for your families and friends who have supported you through your studies. I salute you all.

Australia has never needed engineers and scientists more than it does now. We need you to help us find new ways to respond to climate change, to help fight disease and disability, to deal with the pressures of population.

But what does it mean to be a scientist or an engineer in the 21st century? These are exciting times with continuous improvements being made in technological applications for us to use in our work, with ever-increasing options available to enable us to collaborate and work on a global scale, and with unprecedented levels of access to information in inordinately short time frames.

This is all wonderful and to be applauded but I suspect it is not sufficient. It is no longer enough to sit in your lab or office and get on with what interests you or your boss. It is becoming increasingly clear that we as scientists need to be able to communicate science, not only to our workmates who speak the same language, but also to a much wider audience which clearly needs to have a greater appreciation of what science is all about. We are in

grave danger of having our very reason for existence becoming irrelevant to the bulk of the population – because they don't understand our message or they haven't heard it.

That's why I want to talk about science communication – the importance of getting the message across about:

- What is science?
- How do we do science?
- Why do we do science?

Engineering is a bit different because it is easier for the general public to grasp what it is and why it is important – we need bridges, broadband and bitumen.

Science, it seems, has taken on a mystique of its own – something a bit intangible – something to be wary of – something that others do, perhaps? You may not be wary of it. You may not look sceptically at someone quoting a scientific 'fact' – because you've been immersed in science. You know about science or engineering. You know what's involved. But those who have not been here, to centres of learning excellence like this one, and there are many who haven't experienced these days of wonder, these days of slog, these days of triumph when you get the experiment to work properly! How are they going to be able to appreciate what science is?

We have to tell them! We have to tell them properly – we have to get into the detail – we have to draw the links, make the comparisons, the analogies – in fact we have to venture outside our comfort zone to (a) get the message across about the importance of what we do and why we do it, and (b) to save the integrity of science in the eyes of the general public. We have to get right out into the middle of the playing field so that everyone in all the stands can see us and mark our words and deeds.

This week is Writers Week.

The other night David Malouf, the well-known Australian writer and finalist in the recently announced Man Booker International Prize, and Barry Jones, one of our former Science Ministers in the Commonwealth Parliament and himself a prominent writer and thinker, came to spar before a general audience at the Royal Society. What did they talk about? This very issue – what is happening to us sociologically so that the integrity of science is being compromised, even doubted?

Their insights were fascinating. But without going into what they said, suffice it to say that the important thing was that the debate took place at all! We need to do this more often.

As scientists we must not shirk other arenas. We must engage – we have to. I believe that that has been our problem. We have been too shy, too retiring, too blasé or too lazy – caught up in our own little worlds. The only way we can learn to find our feet and to survive is by embracing the plurality of our world and contributing to it. Silos are not permitted.

We are well placed to start doing this immediately. As we know, science and engineering, in concert with the humanities, have created Facebook, Twitter and the like just in time to allow us to use them to our advantage. Communication, knowledge even, is being democratised – which means it's over to all of us – to explain, to confute, to proselytise, to discuss, and to contribute so that we as a species know collectively:

- why we use fluoride in our drinking water (thanks to the tireless efforts of a former Dean of Dentistry here at this university, the late Professor Noel Martin)
- why cryovacing food is a good idea
- why we prefer to use optical fibre over copper wire.

Each of you needs to be an ambassador for your profession.

Organisations like the Royal Society of NSW, the Royal Institution, the Australian Academy of Science, and Questacon are all making this possible with their broad range of member interests, from astronomy to zoology, and their broad stakeholder base. But they can't do it without you. Engage with them, provide the odd opinion piece, contribute to their wikis and discussion groups, join!

The Royal Society has always believed in crossing boundaries, in getting inspiration from over the fence, in short, in the primacy of the broad view, the view with a room – full of music, literature, poetry, mathematics, art, history, geology, psychology, sociology, astrophysics, biochemistry, astronomy – the lot.

You have to look no further than this university to see why this plurality is so important. Witness the incredible gift of a Picasso to this university in recent months with the donor's

express wish that the picture be sold and the proceeds of the sale used to further scientific knowledge.

But you also need your specialist associations to achieve balance – Engineers Australia, the Royal Australian Chemical Institute, the Australian Institute of Physics, the Royal Zoological Society of NSW and so on – many of which are derivatives of the Royal Society of NSW, which originally had specialist sections devoted to specific disciplines, but all under the broad umbrella of the Society.

Which leads me to Archibald Liversidge.
There he is, at the other end of this stately hall looking down at us as we go through this happy right of passage. Professor Liversidge served this university for 36 years, 20 of them as its first Dean of Science. He was probably the person we have to thank the most for all of us being here today. Without him the very thought of a solid, practical foundation for a rigorous scientific education would not have occurred quite so early in Sydney or in Australia for that matter, and it may not have been based on a philosophy of a solid experimental backbone to its teaching methodology.

Liversidge did so much more besides. He was the initial force behind the adoption of the metric system in Australia. He proved that gold existed in small quantities in sea water. He was instrumental in the establishment of the Australian Academy of Science and of ANZAAS, the Australian and New Zealand Association for the Advancement of Science. He helped establish Sydney Technical College and the Museum of Applied Arts and Sciences, now the Powerhouse Museum. And he was the mainstay of the Royal Society of NSW for a good 25 years at the end of the 19th century. He encouraged the publication of our Journal and he engaged with the wider world, particularly with Britain, North America and Germany, and with the rest of Australia. As Roy McLeod in his recent biography of Liversidge puts it:

His vision helped make Sydney – both the city and the university – a 'moving metropolis' of international stature. His memory continues to inspire those who serve science and society under the Southern Cross.

He was a true polymath of the modern era. And we must emulate him.

So there it is. We as scientists will soon become increasingly irrelevant to the general populace, and hence to our political masters, unless we make an effort to communicate effectively about science. And we won't make the discoveries, we won't have those eureka

moments without looking outside our familiar territory. Our learned societies and professional associations will help you do that.

I'll leave you with one final challenge to send you on your way, and that is embodied in the new motto of the Royal Society of NSW – omnia quaerite – question everything.

Welcome to the worlds of science and engineering. Enjoy them, but above all engage both within and outside of them. Thank you