

# Memories of a Senior Scientist

## Endings and beginnings

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Way back in the 1967 Niels Jerne introduced a Cold Spring Harbor immunology symposium with an address entitled '*Waiting for the end*'. Remarks by F. M. Burnet at the same meeting echoed Jerne's perception that we had solved many of the key problems in our discipline. In his 1968 '*Changing patterns: an atypical autobiography*', Burnet wrote something to the effect that 'he couldn't

understand why young scientists weren't depressed as everything worthwhile had been done'. Now, no senior biological scientist could possibly hold that view. Back then, though, we didn't even understand how little we knew. Now, when I'm asked to write as a 'senior scientist', the only ending I contemplate is my own. There is an enormous amount to be done and much to be discovered. The enterprise will clearly long outlive me. The Olympian heights that could be accessed by a Burnet or a Jerne look out on a vista that is currently so obscured by complexity and detail that broad generalizations elude us. Like traveling to some exotic destination that was once unique but now features a horrible combination of tacky sameness, maniacal traffic and air pollution, climbing that particular Mount Olympus isn't worth the effort. We aren't waiting for the end, just wondering: what's next?

Being continually asked to draw on whatever wisdom I may have achieved over the years leaves me a little nonplussed. Whatever I have to say that is of value to immunology is summarized in a whole spectrum of scientific reviews written over the years. The research program that I nominally head is still very active, split between Australia's University of Melbourne and St Jude Children's Research Hospital in Memphis, Tennessee, also known for being the home of the late Elvis Presley and the place where Martin Luther King was assassinated. At both sites, I have the enormous privilege of being associated with a number of very bright and effective young scientists. They generate most of the novel lines of effort, but tolerate me because: I'm a useful discussant, I write reasonably well and I bring in money. If you want to know what we've been up to and thinking about over the past 5 years, together with a little history, read the following review articles (1–7).

The fact that I was involved in a big discovery that was recognized by some very perceptive Swedish colleagues does, I expect, provide some legitimate reason for wanting to know a little about my personal path over the years. Some aspects were explored in a short autobiographical account that can be found on the Nobel website (Nobel. Se). By the time this is published anyone who is interested should be able to access on-line the article '*Challenged by complexity: my 20<sup>th</sup> century in immunology*' that will appear in the hard copy of the 2007 edition of *Annual Reviews in Immunology*.

Some further autobiographical detail, together with a potpourri of my views on science, life and just about everything can be found in '*The beginner's guide to winning the Nobel Prize*'. Published first in Australia in 2005, then in the USA in 2006, the Columbia University Press edition is available via Amazon.Com, though it hasn't yet been taken up by a European house. This was my first attempt at a book for a lay audience. All sorts of people tell me that it is very readable and young scientists seem to like it. However, it is fairly direct and, as a consequence, there's something there to offend almost every reviewer who comes from the literary, and often dogmatic, side of the equation. Still, I was a novice author when I wrote this, and I intend to continue with efforts to bridge the gap between what C. P. Snow described as 'the two cultures'. Post-modernism has, I think, had a somewhat toxic effect on the broader intellectual life. It diminishes the achievements and nature of science and needs to be combated by those of us who value reason and verifiable reality.

One thing that I am sure of is that the scientific culture is very healthy. If you think about it, you will realize that what we have seen over the past century is the first, publicly funded, mass culture of creativity and discovery. Governments all over the world are obsessed with the idea that future gold mines are in areas like biotechnology. Particularly in Asia, we are seeing very rapid increases in the level of national investment in higher education and research. A little of the momentum may have gone out of this drive in some of the western societies, but the situation still looks to be dynamic in many areas. Also, though the United States is facing financial limits, nobody should ever under-rate the capacity of this most open of all societies to change and embrace new directions. The USA remains the great magnet for talent, and many of its public and private institutions are structured to make the optimal use of that talent.

Because I now spend the majority of my time in Australia and because, until last year when Robin Warren

and Barry Marshall were awarded the Nobel Prize for their magnificent discovery concerning stomach ulcers and *Helicobacter*, I was the only living scientist so honored who was spending the good part of the year in the southern hemisphere, I often find myself on a much more public stage than that accessed by most scientists. Recently, in Kuala Lumpur, I had the privilege/challenge of speaking to almost 1,000 year 10 high school students. Malaysia is, of course, a moderate Islamic country. The boys looked like boys anywhere, but many of the girls were covered and wearing the hejab. At the end, we had questions. These young people, boys and girls, opened up like bright young kids anywhere. My wife was with me and, after the formal part was over, found herself in intense discussion with some of those young women. One was determined to be a neurosurgeon, another wanted to tackle the problems of infectious disease. They were serious, committed and determined.

Beyond what we have to offer humanity as scientists in solving conditions like cancer, AIDS, multiple sclerosis and Alzheimer's disease, we should never forget that public good science and discovery knows no national boundaries. As scientists, our culture is now, and always has been, internationalist. Simply by following our traditions, each of us can do a great deal to combat intolerance, racism and the type of social stereotyping that emerges in times of political tension. Though we may love our laboratories and the peace and satisfaction of being able to pursue real problems in depth, we can also use just a little of our capacity and our understanding to play a broader social and political role in the world around us. We can't blame anyone else for what happens if we fail to make the effort to engage, particularly in issues where we have special expertise and insight.

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- 3 Doherty, P. C. and Turner, S. J. (2004) Memories of virus-specific CD8 T cells. *Immunol. Cell. Biol.* 82, 136–140.
- 4 Doherty, P. C. and Turner, S. J. (2005) The virus-immunity ecosystem. *Arch. Virol Suppl.*, 17–32.
- 5 Thomas, P. G., Keating, R., Hulse-Post, D. J., and Doherty, P. C. (2006) Cell-mediated protection in influenza infection. *Emerg. Infect. Dis.* 12, 48–54.
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