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My first intimate intellectual interaction with a University was with Sydney. Half a century ago, the Professor of Physics, Harry Messel, ran a summer school for students after the fourth year of high school. Scholarships were made available for one student from each of the states outside New South Wales and I came over from Western Australia for 1962-63. It was an intellectual feast, with Professors Herman Bondi and Julius Sumner Miller as well as Messel himself leading us through all the big questions about the physical foundations of the universe.

It's a great pleasure to be back in this venerable academic institution and a great honour to return in this way.

My work on climate change over the past half dozen years has taken me back to that early interest in physics and made me think through some of the interactions between applications of the physical, biological and social sciences and the humanities.

Actually, climate change is only an extreme case of a general proposition in the modern world of knowledge. It helps in seeking answers to all of the important questions facing our civilisation if we can integrate insights from different intellectual disciplines. The integration has to begin with deep understanding within each of the disciplines. None of us can master personally all of the insights even of a single discipline, so an educated mind has to be able to know how to form judgements about what is important and what is known with what degree of certainty in disciplines outside our own. We have to be disciplined enough to focus on what is important, diligent enough to absorb a great deal of important information, and strong enough to reject any failure of logical connection between strings of information and conclusions that are drawn from them. Mastering one discipline helps develop the capacities that are necessary to draw insights from others.

When I was conducting my two Climate Change Reviews I called climate change a diabolical policy problem. It was diabolical because there was uncertainty in the best science about how current emissions of greenhouse gases related to future concentrations in the atmosphere, about how concentrations of greenhouse gases in the atmosphere related to temperature, and about how temperature related to other aspects of climate and to various impacts.

It was diabolical because action had to be taken now to achieve results that would not be seen for many years.

It was diabolical because the outcome from decisions in one country depended on actions taken in other countries, requiring international cooperation of unprecedented complexity and extent.

It was diabolical because action in any one country would damage weighty established economic interests and people representing those interests would oppose it.

But I noted as well that there was a saving grace that might make all the difference. A large number of people in many countries recognised that mitigation was important to the health of our civilisation and would support a government that took firm action.

Careful analysis shows that when you separate the policy problem into its parts, it can be analysed to define a way forward.

Analysis shows that uncertainty strengthens the case for early and strong action. The science shows clearly that the average of outcomes from business as usual would be adverse and large. Uncertainty means that the outcome might be more or less severe than the average of expectations. These circumstances usually lead us to pay for insurance against the worst outcomes.

The fact that mitigation imposes costs now when benefits are not received until much later raises two types of challenge. One is the problem of human cognition—many of us find it difficult to believe what we cannot see now. This is straightforwardly a problem of ignorance, which can be corrected through education. The other is the difficulty in weighing the value of the lives of people living now (who will bear more of the costs of mitigation) against the lives of people living in future (who will benefit from those costs). Is the fact that benefits come later, maybe much later, a reason for valuing them less highly than costs borne today?

This is a complicated problem but one that is amenable to analysis. If people are much poorer today when the costs are being borne, we may reasonably value a dollar of costs to them more highly than a dollar of benefits to richer people in future. This is especially important in developing countries. This reality makes a case for asking people in poor countries to carry less of the costs of mitigation at least in the early years. I worked through these inter-generational and international distributional issues in reaching my conclusion that it was in Australia's interest to do its fair share in an effective international effort to seek to hold temperature increases to 2 degrees above pre-industrial issues.

It took a while for me, and for the international community, to think our way through the challenge of international cooperation. The world of national states tried to reach a binding and comprehensive international agreement in 2009. As we learned at the Copenhagen meeting of the United Nations Framework Convention on Climate Change, that was an impossible task for the time being.

Subsequently we found that we could make progress within what I call concerted unilateral mitigation. Each country notes what others are doing, and sets its own targets, and adjusts them over time in the light of what others are doing. All of the world's economically significant countries made commitments at the Cancun meeting in 2010 to reduce their emissions below what they otherwise would have been. The two biggest emitters, the United States and China, made major commitments: the US to reduce emissions by 17% on 2005 levels by 2020; and China to reduce emissions per unit of production by 40-45% over the same period. Australia committed unconditionally to reduce its emissions by 5% on 2000 levels by 2020, by 15% if all developed countries made comparable commitments and developing countries substantially reduced the trajectories of emissions; and by 25% if the world entered a binding agreement built around holding likely temperature increases to 2 degrees.

The good news is that virtually all countries are on paths to meet their targets. This will trigger a requirement for Australia to move to the conditional target of minus 15%.

The Australian policy that was passed into law by the Parliament in 2011 is designed to allow us to meet the minus 5, minus 15 or minus 25% targets at reasonable cost.

The new Australian government elected on September 7 has committed itself to removing the 2011 policies and seeking to meet Australia's targets by "Direct Action". It is not impossible in principle to make large reductions in emissions through Direct Action, but it may turn out to be extremely expensive. If the cost is too high, some will argue that we should forget about doing our fair share of the international mitigation effort.

Analysis tells us that that such an outcome would be unnecessarily damaging to Australia's national interest.

That's where good judgement and intellectual diligence, discipline and strength are needed to make sure that Australians do not accidentally end up in a position that later generations wish we had avoided.