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CEDA
COMMITTEE FOR ECONOMIC DEVELOPMENT OF AUSTRALIA

Launch of CEDA National Publication:
The Business of Defence - Sustaining Capability

Innovation for Defence

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At one level it's quite simple: innovate or die.

Yet we all recognise that it is not in fact as simple as that: attempts at innovation, however laudable, can be misguided and fail. Perhaps the failures will be disastrous; and in any case there's always the question of opportunity costs – there is a need to set priorities even for attempts at innovation, if you are to get the most benefit from the use of resources.

Innovation in defence needs some special attributes. As I once commented to what was then the Industry Commission, Defence does believe strongly in competition: the ultimate competition of armed conflict between nations. This blinding statement of the obvious did not make it into the Industry Commission's final report, but I would like to think that it caused a moment's reflection. For the special market place of defence, namely the battlefield, can be unforgiving, both for the direct participants and for the nation on whose behalf they are fighting. It is important, then, to be confident that innovation in defence is moving in the

right direction, and that the risks be understood and ironed out, well before the ultimate test of military operations.

In this talk, I shall touch on the context provided by Defence's record of innovation in Australia, and then bring out some of the more important points from my chapter on technology and innovation in CEDA's publication.

Let's start with the Australian Defence Force (ADF) itself. It seems to me that one of the enduring characteristics of the ADF is its predisposition to be innovative and resourceful. There is a culture and an expectation that members of the ADF, no matter how junior, will take the initiative. This is an important point of differentiation from the cultures that prevail in some other defence forces, and it positions the ADF well to take advantage of the new opportunities in command and control that modern technology is offering.

It must be said, however, that not all of this culture of innovation transfers itself to Canberra. There are times when the culture in Canberra, both military and civilian, can be solid, even timorous or fearful, rather than imaginative and forward-looking. So the record in this respect is more mixed.

Nevertheless, if we take a few steps back from the coalface and get things in perspective, we can recognise the magnitude of the changes – the innovation – that have taken place over the years in the major areas being addressed at this launch today. It is important to acknowledge the corporatisation and privatisation of the dockyards and factories formerly owned by the government. There were the important steps that led to greater use of the private sector in support areas, following government consideration of Alan Wrigley's Report on "Defence and the Community" in 1990, and of the Defence Efficiency Review (the McIntosh Report) in 1997. More recently, there has been the review by Malcolm Kinnaird that led to the new arrangements for the Defence Materiel Organisation. And it would be appropriate also to mention the changes to high-level command arrangements

instigated in particular by John Baker when he was Chief of the Defence Force.

There has also been progress in the area of defence policy for industry, not least through the contributions of Paul Dibb in this field since his return to the ANU in the early 1990s. Paul's work well illustrates some of the problems that can be faced in this area. I recall all too clearly the criticism that Paul was subjected to, by those who really should have known better, for his innovative work in the early 1990s on priority-setting in defence industry policy. Yet when the hue and cry was over, these same people were quick to adopt his ideas as their own.

So the good news is that change and innovation do occur, sometimes at quite a profound level, and in spite of the conservative cultures that can characterise the ADF and Defence more generally. Just think how different Defence is today from what it was, say, twenty years ago. The not-so-good news is that a lot of the change has come, and has had to come, from the outside, through Ministerial initiative in particular. And a lot of the change has caused much resentment, even angry incomprehension, at the time of initiation and implementation. Overall, the rate of progress has often been slow.

I have two reasons for saying all this. First, it would be simply quite remarkable if there were not further scope for innovation in the relationships between Defence and industry or with the community more generally, even though it might not yet be clear what these new possibilities might be. On balance, Defence has shown an ability to reform, especially when spurred on by Ministerial edict. So we can have a good level of confidence that if industry has some well-thought-through innovative ideas that will bring benefit to Defence, sooner or later they will be listened to. I stress, of course, that the ideas do have to be good ones, and that they do have to bring benefit to Defence, and not just to the industry concerned.

Second, my observations on innovation in Defence provide the context for the more specific matter of scientific innovation, the subject of my paper, to which I now turn. A principal conclusion of the paper is that, in many ways, scientific innovation in Defence in Australia is in good shape. I will not read the paper as such, but will pick out some particular features or issues. I have five points to make.

First, the importance of professional scientific advice to support our national defence effort is well established: next year will see one hundred years since the earliest antecedent of today's position of Chief Defence Scientist was formally established, and a similar position had been established some ten years earlier in the Colony of Victoria. Despite some ups and downs over the years, the Defence Science and Technology Organisation (DSTO) is today in good shape and has an expanded national role in leading the application of science to counter-terrorism. Further, there's a wealth of world-class understanding and experience in science and technology and in how to apply it to Australia's national defence and security interests; this is especially in DSTO but also in some cases in industry and other research organisations.

Second, it's not that difficult to derive a set of sensible and practical criteria to help with the task of setting priorities and choosing what gets funded and what doesn't. We are fortunate in Australia in that we are not on the strategic front line, at least in classical military terms. This means that we can usually afford to wait for others to take the lead in applying new technology to defence, and then, often using our highly privileged relationships with countries such as the US and the UK, to buy it from them.

But there are still gaps that need attending to, sometimes in subtle ways; and sometimes opportunities arise that are too good to overlook. All of this can lead to the need to conduct scientific investigations and to develop our own Australian products. To my mind, there are four broad criteria that apply, along the following lines:

- Where Australia has critical needs that are so different from those of other nations that their products do not come sufficiently close to what we require,
- Where we have sensitive and compelling national security concerns,
- Where not even our closest allies are prepared to share sensitive information or materiel with us, and
- Where a new idea has emerged with potential benefits so compelling that it would be folly not to take it further.

These criteria, either separately or in combination, are a guide to the more-detailed questions to ask, a conceptual framework if you like, rather than a catechism with direct answers. Further, it is not unknown for allies to become more open with us once they realise that we are doing our own work in fields that they regard as sensitive.

Let me make these criteria more concrete by offering some examples.

- Our different needs were behind the development of the Jindalee over-the-horizon radar; our different terrain and vegetation require uniquely Australian camouflage patterns; and Australia's different military character requires a customised approach to at least some command support systems.
- Research in cryptography and counter-terrorism are just two areas where national sensitivities can apply.
- Reluctance of allies to share with us has led to Australian innovation in radar cross-section reduction and the acoustic tiles for the Collins-class submarines.
- And the NULKA decoy and the Starlight computer security device have been just two of the innovative ideas just too good to ignore.

Third, I should mention the Capability and Technology Demonstrator (CTD) program that Defence has been running since 1997-98, with its focus on how to exploit fast-moving high technologies. This initiative has proved a valuable source of additional funding for innovation, and an invaluable catalyst for cultural change.

Fourth, what about the future? Soothsaying is an error-prone activity that attracts ridicule, but we have at least to make an attempt to look into the future and to anticipate the challenges and opportunities. Let me chance my arm with the following:

- New science and technology will continue to bring changes; the opportunities will in effect seem limitless; technology and war-fighting will continue to go hand in hand; it ought to be redundant to say this, but the record of its being recognised in practice is not always encouraging.
- Will there be changes in strategic policy and will they affect priorities for innovation? To my mind, no to both questions, at least at the level of policy principle. So we will continue to need to apply innovative science to our own special needs, and to fill the gaps left or caused by others.
- Will there be adequate levels of choice? This is more speculative, but with continued consolidation of defence industries around the globe, choice is reducing. And it might become the case that, at least in a few critical areas, Australia should consider taking part in joint projects led by overseas partners to ensure that our needs are being met. I should add that, in 2003, the US defence R&D budget was five times that of the EU nations combined, so there are implications here for where we would need to source the really high-tech stuff from, a few years from now.

- The trend towards in-service upgrades will, if anything, increase. This will provide significant opportunity for innovation, either independently by

Australia, or in collaboration with the company or country of origin.

Fifth and finally, how can we make a good system better? I'm a great believer in firm foundations, so removing any ambiguities in the Government's defence and security policies would be valuable, as would ensuring a high level of consistency between strategic ambition, funding levels, and resource allocation within the defence budget. And there are some matters that need attention in the management of the CTD program, such as how CTD projects that prove successful get taken further.

But the biggest steps to help improve defence innovation would come from further cultural change. This would involve greater recognition of the importance of science in our national psyche, less reluctance in some parts of industry to seize opportunities for innovation, and less reluctance in parts of Defence to accept the benefits of Australian innovation that are already available.

keep me busy for a while longer yet. Thanks very much for listening.

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