SUBMISSION 34

ADDITIONAL SUBMISSION BY CHAIR OF ASAC
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DRAFT

The main reference of this committee concerns, I understand, the adequacy of the level of funding. Ask any Antarctic scientist and the answer will be a resounding no. There is always more to do than we can currently afford. But I will try to offer a more sober assessment.

ASAC has conducted a thorough evaluation of the Antarctic science program within a realistic financial framework that recognizes that funds are not open ended: that to do new things some old things may have to cease.

Thus we wish to have more shipdays for marine research in the southern ocean and at the ocean-ice interface and this must come from savings in transport costs for ferrying scientists to the continent.

Thus we want more mobility within Antarctica to expand the science base and this must come from savings in operating costs of the permanent bases.

In both these examples, there are bridging problems and what is needed is a sensible transition from old to new that does not impact on the science output. What will be required is funding for the bridging period so that an effective air transport system can be put in place without disrupting the science in the meantime and which allows for a progressive downscaling of some operations. I do not know what the requisite level required is but I am sure that AAD can provide estimates.

A second funding issue concerns the ability of AAD and Antarctic Science to respond to one-off opportunities that arise from the international linkages. The example in mind is the International Polar Year, actually two years from March 2007 to March 2009. This will be a 'time of internationally focused Antarctic' research on issues of global importance. These are opportunities for Australia to shape Antarctic research and direct it at issues that are important to Australia but the participation comes with a price tag. This can be partly met by directing 2006-2007 and 2009-2010 funding towards the IPY projects. But I would argue that new funding for a fixed period, of say three years (the third year for completion of analysis of data collected) would result in a much improved output in terms of science and in terms of international visibility. Again, I am not prepared to say what a requisite level of funding should be for this, but I would like to stress the importance of being able to respond to such limited-term projects without disturbing the also important longer-term baseline studies.

A number of IPY projects are currently being planned by Australian Scientists and the Chief Scientist, AAD, will undoubtedly be able to brief you on this. What I would like to emphasize is that these opportunities do not come often but when they do they challenge AAD and the University research sector to work together to work on programs that are central to Australia's long-term national priorities.

There are a couple of other points that I wish to make.

- Science program: The ASAC evaluation, (I call it ASAC but it is an international and independent assessment) showed that the Antarctic Science carried out in Australia is of very high quality, world leading, and something that Australia as a whole can be proud of.

- Air transport: The question could be asked is why, if the program is so successful, do we need air transport. The response would be that the science goals move on: For example, there is a shift to greater mobility within Antarctica. To study the recent past climate record requires shallow ice cores from many localities. To monitor ice movements requires a much larger network of observations than is currently achieved. To probe what is beneath the ice requires instrumented aircraft rather than tractors to achieve coverage.

- But also, there is a greater diversity of fields represented in Antarctic Science and therefore in the diversity (and numbers) of scientists that should go down. The ASAC report emphasizes the need to break away from the traditional projects and for Antarctic Science to become more interdisciplinary. This requires greater efficiency and lower costs per project and less 'dead time' when scientists occupy base-berths waiting to be shipped out. The integrated air transport to Antarctica will achieve this efficiency and expand the science program.

Finally, I would like to address very briefly the question of "why do Antarctic Science". I will address only four points briefly:

- Polar climate does control world climate. The scenario in "The Day After Tomorrow" is correct in that changes in ice extent can have dramatic impacts on the thermo-haline circulation of the world's oceans. Antarctica does play an important role in this and changes in sea ice extent and in freshwater input do affect the circulation in the southern ocean and hence the climate and weather of Australia through the interaction of the polar-driven change with low-latitude climate forcing. A reasonable understanding is developing of these systems but predicting weather on a seasonal time scale remains uncertain. Such predictability must surely be one of the most important requirements for developing a sustainable Australia. But this can only come about if (i) we monitor and model the weather and ocean systems in Antarctica and the southern ocean, and (ii) we have a comprehensive understanding of past changes with which predictive models can be tested.

- Similar arguments can be developed for the biological components of Antarctic Science, in particular, concerning biodiversity and changes in it. In addition there may be a potential for commercial product development. Are there Antarctic parallels to the tropical fauna based sunscreen developments? Are there genetic properties of Antarctic flora and fauna that may provide insight into preservation of products at low temperatures? These are not areas that I am familiar with but the AAD Chief Scientist can no doubt develop this point but they include:
(i) work on polyunsaturated fatty acids (PUFAs) in Antarctic marine algae. This is not yet at commercial stage, but has potential to become so in the longer term.
(ii) w ork on enzymes of freshwater alga to produce antifreeze agents. This has resulted in a UK patent.

To this I would add, as an example of the unexpected, work, by French researchers on the mechanisms whereby King penguins prevent their stomach contents from being digested during the chick-feeding season. The now-patented compound, called Spheniscin, has high antibacterial and fungicidal properties of commercial interest.

- International obligations under the Antarctic treaties and protocols requires that Australia has a strong and respected research program. Australia cannot maintain leadership in shaping policy if its science is not respected. If Australia wants to modify policy it can only do it if it has a cast-iron scientific case first.

- Showcasing Australia's Science. There are not many areas where Australian Science can compete unchallenged by the world's big players. Antarctic Science is one where it almost can. Quantifying the benefits of this is hard to assess but one benefit is that it attracts international collaboration which leads to a sharing of costs and to access to resources not otherwise available. The recent collaboration with Germany in the southern Prince Charles Mountains is one example of this.

ASAC is a body made up of scientists who are not generally known for their Antarctic Science. Instead, they are leaders in their own fields who have also developed the ability to look beyond their own disciplines and to identify what is important for the broader community. As such, their endorsement of the Antarctic program, and their recognition that it must go forward, as an important component of the broader issue of developing a sustainable Australia, cannot be ignored.

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