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FUTURE DILEMMAS: A REPLY TO THE CRITICS

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*The release of the CSIRO Future Dilemmas report on population environment futures sparked a widespread debate in the Australian print, radio and television media. As well as the positive or neutral responses that focused on the issues, there were three sources of overt criticism to which one of the authors replies in this article. The first are the economists, Chris Murphy and Mark Wooden, members of the Ministerially appointed external reference group, who oversaw the project in due diligence terms. The second is the green movement where the response is focused on the article by Ted Trainer in *People and Place* (vol. 11, no. 1). The third are three journalists from *The Australian* newspaper who concentrated their commentary on personal criticisms of the authors, rather than dealing logically with any of the factual issues analysed in the report. The three sets of criticisms help focus the next stage of the work but it is unlikely that doubling the effort and increasing the precision of the work will alter the attitudes of the broad groups that these critics represent. Once strong ideologies are formed, whether in science, society or politics, they are difficult to deconstruct and reform.*

THE CONTEXT

Economic growth and national development bring good things but they also bring challenges, drawing down resources and environmental quality. The tension between the good and the bad currently defies resolution. National issues of international debt, balance of trade deficits, greenhouse gas emissions, biodiversity decline, and land and water quality seem to oppress even the most optimistic of the long-term thinkers as they balance these concerns with the daily recital of good news about economic growth and business opportunities. There is good reason for sensible observers to moderate their enthusiasm for economic growth and it is this: each dollar of extra GDP generated in Australia requires 10 megajoules of fossil energy (10^6J), 37 litres of water and three square metres of land disturbance.

Once this did not matter. The world was so wide that human impact seemed infinitesimal compared to the bounty of seemingly limitless resources with which most nations were endowed. But today some experts suggest that the good times can't go on forever. Other experts, many of them from disciplines related to

economics, strongly contest the harbingers of doom. These commentators believe that if nations become more efficient, if they concentrate on institutional reform and engage in world trade practices that are free and unrestrained, then human endeavour can go on for ever. Seemingly, in this view, there are no limits to the human spirit and its inventiveness once the shackles of constraining laws and customs are removed.

It was against this background that a long term futures group was formed in the CSIRO (Commonwealth Scientific and Industrial Research Organisation), an Australian public-sector science organisation. The group's task was to focus on environmental and resource issues in time frames that went far beyond the shorter term focus of economic markets and electoral cycles. One of its first nationally focused research outputs was a study entitled *Future Dilemmas*. This explored resource issues related to three different scenarios of population growth: high, medium and low. The report was launched successfully in early November of 2002 and sparked an active media debate for about a one month period. This article

focuses on several nodes of trenchant criticism directed at the report, its authors, and, by association, the institution within which the research was conducted. This article comments specifically on three sources of criticism: a group of economists, an environmentalist, and journalists from the national media.

THE ECONOMISTS

As part of the Ministerially appointed External Reference Group for the *Future Dilemmas* study, economists Chris Murphy and Mark Wooden identified seven limitations of the CSIRO model¹ but their key complaint was an absence of prices in the modelling approach. This is mentioned explicitly in three of their seven limitations and is directly implicit in a fourth. Prices are a central feature of modern economic theory, and economic theory has become the core discipline of mainstream policy analysis. It is easy to understand why Murphy and Wooden, practitioners with established reputations in this field, should be concerned about the absence of prices.

Mainstream policy analysis is the routine stock-in-trade of government departments, economic bureaux, and consulting groups such as Econtech (Chris Murphy's consulting firm).² Policy analysis is concerned with activities such as internalising externalities, reforming the tax system, and making a wide range of incremental improvements to the way the economy works. Its analytical techniques predict behavioural responses to marginal changes on the basis of observed behaviour and on the assumption of 'other things being equal' — that is, no major or structural change. While this analysis is vitally important to our everyday lives, for the purpose of this discussion it could be classified as *tactical* management of the economy. However sometimes we need to

think *strategically* and across generations, timescales that were included in both *Future Dilemmas* and the recent *Intergenerational Report*.³

Public policy intervention is meant to represent communal choice. For it to be a real choice it must be possible to consider a range of outcomes besides market outcomes alone. Indeed, the need for policy intervention arises precisely because the market outcomes are undesirable in some way. In seeking solutions, it must be possible, in the first instance, to consider policy options from the full range of physically feasible possibilities. The scenarios developed in *Future Dilemmas* are physical descriptions of possible futures and the paths through time by which these futures may be reached. For example, scenarios might be developed leading to future societies with economies in which yearly greenhouse gas emissions had been reduced to much lower levels than today. These different scenarios (alternative options to today's status quo) might emphasise new energy technologies, carbon sequestration, conservation, more modest lifestyles, or combinations of all of these. Reducing greenhouse gas emissions will not be easy, and will almost certainly require substantial economic and social change over a long period. Few of these prospective scenarios might be economically feasible by today's criteria that are based on current economic structures and, in particular, the easy availability of cheap fossil fuels. In seeking solutions, it is important however not to rule out possibilities simply because they are incompatible with the current perceptions of the immediate challenges to lifestyles, consumption habits and ideologies that characterise Australia in the year 2003.

The overt absence of prices in the CSIRO model as a singular analytical

policy lever, does not imply that prices are not important. Physically based scenarios provide technological description of the transition pathways to possible future economies. If those transitions do come to pass, it will be because people choose them for many reasons, and some of these reasons will be associated with price. Other means of change could come about because of policy dissonance, some because of new technologies and some because of shocks to the social system to which people respond in many different ways.

The difference between the Murphy/Wooden way and the *Future Dilemmas* way is that the physical economy approach in the latter is doing different things. It is the difference between strategic thinking (the long term and between human generations) and tactical thinking (the short term and three year electoral cycles). In the more focused and shorter term policy world of Murphy and Wooden, analysis is concerned with incremental adjustments where ten years is the long term. In this time frame, people's responses to policies can reasonably be inferred from economic analyses, the empirical basis of which is observed behaviour in the current economy. By comparison, the *Future Dilemmas* approach tries to address strategic issues where the time scales may be 50 to 100 years. These are the timescales which match the lifetimes of people, houses, commercial buildings, defence platforms, electricity generators and most major items of national infrastructure. In these timescales, the physical feasibility of all key processes is in question. Is there enough oil and water? Will the slow moving toxification of our arable land base outpace the innovation and science driving the development of food production systems for domestic use and export trade?

Murphy and Wooden link the resource scenarios in *Future Dilemmas* to 'the Club of Rome' work in the 1970s. Here the Club of Rome work is generally quoted as incorrectly predicting the early depletion of natural resources such as oil, natural gas and metals. A contemporary re-examination of this 30 year old report reveals that many of its anticipations are currently well underway, including the depletion of marine fisheries, an increase in inequality between the rich and poor countries (driven in part by population growth) and an increase in several forms of pollution, the most notable being increasing greenhouse gas emissions. Frequently, concepts and words are taken out of context by critics. Often a minor part of an original report is used to damn the study as a whole. It is never clear whether the critics are quoting each other in the way that 'urban myths' are perpetuated, or referring back to the original source. The resource depletion criticism is based on Table 4 in the Club of Rome's *Limits to Growth*.⁴ This is part of a simple working through of the differences between constant and growing resource use. The table entries used in these numerate illustrations were not model input. The Club of Rome's model did not refer to individual resources such as natural gas and aluminium. It was highly aggregate and used undifferentiated lumps of resources similar in operation to many economic models. In relation to their model's behaviour, the *Limits to Growth* authors state explicitly, 'The exact timing of these events is not meaningful, given the great aggregation and many uncertainties in the model'. This is another example of the confusion between predictions and scenarios. Murphy and Wooden are correct in claiming that both *Future Dilemmas* and the *Limits to Growth* used the concept of scenarios.

Indeed both of them used data. Does that make *Future Dilemmas* doubly wrong?

Murphy and Wooden also point to the fact that the CSIRO model is silent on the economies and diseconomies of scale. This is a reasonable technical point. Whether these issues are the concern of migration policy or local environmental policy is a moot point. One of the main motivations for our work is to emphasise the interactions between institutions whose policies sometime produce perverse outcomes that extend well beyond the mandate of a particular minister. The fact remains that, all other things being equal, managing issues such as urban air quality will be harder in a larger than a smaller city. There may, in fact, be diseconomies of scale and the emerging area of complex systems science suggests that large and complex organisations are prone to catastrophic failure.⁵ So far Australian policy makers have tried to separate environmental issues from population policy and affluence issues. Failure to integrate such issues leads to the complex interaction of crosscutting issues highlighted in the *Future Dilemmas* study.

The Murphy/Wooden critique provided commentators in the media, politics and the bureaucracy with the raw material they needed to criticise and partly discredit the report. Their most common explicit criticism of *Future Dilemmas* was that the authors failed to listen to the economists' advice. But our criticism of Murphy and Wooden is that they failed to engage with the key physical issues that could (not necessarily will) be important in Australia's long term future. More fundamentally, economic analysis itself suggests that markets cannot be relied on where adverse social or environmental impacts occur at a distance, or after long lags, or are difficult to reverse or repair.

Unfortunately, most of our major environmental challenges fall into this category including the impacts of climate change, resource degradation, land clearing, and threats to the Great Barrier Reef. The same characteristics help explain the persistence of many of our most intractable global social problems. The constant promotion of price mechanisms as virtually the only policy lever with traction is at odds with reality. Given that economic philosophies have held sway in national decision making for at least the past four decades, why then does the nation still have environmental quality problems when such potent methods were available? In fact price mechanisms, gently applied in the case of leaded petrol, are not politically acceptable when applied with enough pressure to exact a change in consumer behaviour. Another reality is that the dilemmas highlighted in the report are not yet seen as linked problems and this presents a worrying impasse between rhetoric and reality. However there is still time to prepare, plan and act towards the eventual resolution of the physical problems highlighted in *Future Dilemmas*.

THE DEEP GREEN

Ted Trainer's critique of *Future Dilemmas*⁶ brings together a stimulating summary of many environmentally based criticisms and will be used as the 'green' point of view with replies made to five of his points. In general, Trainer does not acknowledge the institutional challenges of undertaking quantitative futures studies at a national level and the constraints imposed by the terms of reference of the study.⁷ In reality, Trainer is asking for disinterested research which is trustworthy and dissociated from material interests. In an article on the continuing need for such research, Ziman⁸

notes a worldwide trend towards the dilution of key scientific principles and the post-academic research culture⁹ which is increasingly being dominated by utilitarian goals. Both Trainer's comments and the *Future Dilemmas* study could well fall short of the lofty goals of traditional disinterested science. Some of Trainer's frustration may be derived from the apparent distance or lack of interest in specific issues and a perception of a lack of urgency on our part. However an unexpected outcome has been a continuing strong interest by the Australian business community in the *Future Dilemmas* study. This has been attributed to its 'robust quantitative nature' and the 'presentation of the issues (almost) without personal opinion'.¹⁰

Trainer's assertion that the 'report's interpretations are at best quite misleading in understanding the magnitude and difficulty of the problems generated by commitment to affluent consumer society'¹¹ reflects the authors' challenges in responding to the terms of reference of the study, and the careful language generated in the report's final draft by the process of scientific editing and policy vetting. The terms of reference deliberately focused the study on the physical economy with riding instructions that social and economic areas were the preserve of other experts and other studies. In meeting these requirements, the study sought to stay within the bounds of traditional science and, in the end, we believe it met this goal. There were many assumptions within the simulation modelling where the actions of an 'affluent consumer society' under conditions of strong economic growth were emulated.

However, balancing these assumptions on the processes behind economic growth, were technological settings such as 'that coal fired electricity generators would

approach their thermodynamic design limits' and that various lifestyle parameters such as 'the floor area of domestic houses would saturate'.¹² The dynamics of the interactions of these issues meant that some areas did not appear quite as challenging as a straight line projection over long time frames would initially suggest. Expressed another way, the scenarios in *Future Dilemmas* propose design goals which environmentally caring and technologically literate Australians could aspire to, if they changed from networking and talking to aggressive and positive action. At a higher level, the study proposed six important 'future dilemmas' each of which requires focused and aggressively implemented solutions, and then an even bigger solution that brings those six together and makes sure there are no perverse outcomes that escape from 'sector only' solutions. The key point is that all of these six dilemmas interact, and that sector-specific solutions will probably fail in a macro sense. *Future Dilemmas* introduced the physical dimensions of these concepts for the first time to many Australians.

Trainer's point that economic growth¹³ (as it is currently implemented in Australia) poses a far greater risk to the environment than population growth alone is true enough. The study's treatment of it was incomplete for three reasons. Firstly, the physical conditions for contemporary economic growth rates were set at growing rates in each of the modelling sectors. However the authors did not report on growth's failure or otherwise in economic terms since the outcomes of economic growth were excluded from our analysis by the study's terms of reference. Secondly, in institutional terms and given the range of challenging results embodied in the study as it was, it would have been

incautious in the extreme to take on the one national indicator of excellence to which every politician, bureaucrat and journalist reverently genuflects. More independent bodies such as think tanks are institutionally freer to take such risks and to range more broadly in their policy analyses.¹⁴ Thirdly, we remain technically uninterested in economic growth per se, provided that a scenario we test can maintain a growth in dollars but negate the growth in resource use and environmental impacts.

Trainer states that he does not believe that dematerialisation¹⁵ of the economy will save the day. Technically we retain an open mind and seek improvements in our data and modelling capability so that we can put dematerialisation to the test. We already know that, within three decades from now, most of our known technologies and industrial processes will saturate, and then there will be no more technical efficiencies to be gleaned from them. However, there is a possibility that a nation could progress to a 'music and poetry society' where sustained intellectual growth rather than growth in possessions might become economic drivers and the focus of national management. In this society, the material transactions could be similar to Trainer's 'simpler way'¹⁶ and our technical task is to test the complex transitional pathways and report on additional dilemmas that could be faced in such a future.

Trainer raises the problem of the 'Jevons paradox' or 'rebound effect'.¹⁷ This is based on the observation that, when a more efficient technology is introduced, lower costs often prompt people to increase their consumption of resources. Rebound is one of the most complex issues to manage in an intellectual, practical and policy sense because it negates many well intentioned technical

and policy innovations designed for environmental improvement and societal progress. Trainer is correct in his claim that this rebound effect causes economic growth, a fact well enumerated by an elegant study of the US economy over the last 100 years by Robert Ayres.¹⁸ However the scientific challenge is to design and test long term scenarios that progress our economic and physical structures to an alternative state where we are able to constrain the rebound effect, or at least cut off the negative environmental consequences.

Another physical economy modelling framework, *OzEcco*,¹⁹ has been designed to help this search. Some initial success from this modelling has suggested a combination of three unlikely strategies for energy and greenhouse challenges. The first is to deflate the money supply in the domestic economy by channelling investment funds to overseas economies or to an 'ecofund' used to repair intractable national issues such as land and water quality. The key strategy is to invest comprehensively in areas that have slow knock-on effects so that immediate re-stimulation (that is rebound) of the economy is avoided. The second is to aggressively invest in expensive rather than cheap renewable energy technologies at the same time as shutting down significant components of the current fossil energy base that underpins economic growth. This again slows down rebound but, we hope, in ways that generate strong employment growth that maintains positive social returns. Combinations of these investment shocks give an outcome that the energy content of our per capita lifestyles stabilises around the level experienced in the early 1980s. Adjustments will be needed to accommodate this, but they could be expressed as improvements in social and health indica-

tors²⁰ rather than purely as a decline in personal or material consumption.

Future Dilemmas' views on the depletion challenge for oil and natural gas stocks²¹ do not propose an imminent crisis as Trainer asserts, but aim to raise the issue to that of a 'dilemma', which requires some solutions. The current reality of national petroleum stocks²² is that the petroleum industry acknowledges a looming constraint in easily available domestic oil, but that the nation has large (though not unlimited) stocks of natural gas. The transition from petrol to compressed natural gas as a transport fuel is a reasonably easy task but this will draw down the natural gas stocks at a faster rate. The question is: after oil and gas what then? Some simulation testing is being undertaken on replacing petroleum with wood for the production of bio-electricity and bio-methanol.²³ Still Trainer is not happy with prospective solutions that might evolve over the next 50 years as they seem not to support his one goal of 'The Simpler Way'. His assertion²⁴ that Australian land will only produce four tonnes of biomass per hectare is unduly pessimistic when forest assessments of New South Wales²⁵ alone indicate nearly 20 million hectares with productivity exceeding eight tonnes per hectare per year. Trainer's undue pessimism can be understood with the hindsight of past national follies. However, the design approach we implement can be used to propose radical alternatives that could work. Trainer has his strongly preferred future whereas for us it is still a complex work in progress.

Finally, Trainer is wrong to assert that the report keeps alive the faith of a 'tech-fix'.²⁶ The fourth conclusion in *Dilemmas Distilled*, the shorter version of the main report, notes that 'while technology can be a powerful ally, it will struggle to reach its full potential under the

current structure and function of Australia's economic and social system'.²⁷ The more guarded tone was employed with the aim of informing and engaging policy analyst, but not decoupling them from key long term issues for which solutions must eventually be found.

THE MEDIA

From an Australian print media perspective, the release by Minister Phillip Ruddock²⁸ of the *Future Dilemmas* report on November 7th 2002 stimulated a reasonably balanced coverage. In a measure of column inches (or square centimetres), 77 per cent of the coverage was neutral, 13 per cent was negative and 10 per cent were positive.²⁹ The most common themes were that the document was controversial (15 per cent), that Australia must reduce its reliance on a consumer fuelled economy (13 per cent), that a higher population would cause environmental degradation (11 per cent) and that Australians would have to modify their lifestyle to cope with an increased population (11 per cent). Three journalists from *The Australian* stood out as taking an aggressively negative attitude to the report: the economics editor Alan Wood,³⁰ the editor at large Paul Kelly,³¹ and the features writer George Megalogenis.³²

Allan Wood's piece, 'Narrow views on broadening population', contains three sections that are extremely specific in the focus of their technical comment. The first section was as follows:

And this is a report that has been significantly rewritten. The original report was regarded as so one-sided and inadequate by the Government that it led to a nasty spat between the Immigration Department, which commissioned and partly funded it, and the CSIRO.³³

Like any scientific publication, the report was always being revised and rewritten. This is part of the scientific process but little of this could be termed significant rewriting, apart from two items. One analytical section on the relationship between the immigration rate and unemployment rate was dropped. The story of the 'nasty spat' was not true, but discussions concerning the content of the report were frequently highly challenging and this impacted on a final synthesis chapter. This chapter had been written at the express request of the external reference group appointed by the Minister. The group's riding instructions to the authors was to 'tell us what it really means, and how it really is'. The full message of the final chapter was not accepted by the client, and as a consequence, the chapter was eventually deleted.

The Government received a stream of complaints from various experts involved in the large number of workshops that were conducted in preparation of the study that the CSIRO authors were simply ignoring their views on, and objections to, various aspects of the report.³⁴

The second item on 'complaints' is perplexing. It is possible that the client may not have passed on the 'stream of complaints' to the project team, but for what reason it is difficult to discern. Sixteen expert workshops were run to vet the function of the modelling framework and the assumptions included in the scenarios. Within four days of the completion of each workshop, an eight page workshop report was sent to the client and all attendees. This was then followed by three to four editing rounds until a final sign off by the client. The vast majority of points were included and a full paper trail was kept which remains

available today for audit. The authors know of one complaint from the representative of a lobby group connected to the building industry, and strong criticisms from two members of the external reference group. So the 'stream of complaints' was never presented as such to the project team, and reasonable responses to Wood's journalism are therefore difficult to present.

The CSIRO also vigorously resisted the appointment of an external reference group of experts to review the report, despite the fact that peer review is supposed to be a crucial part of the scientific method.³⁵

The third item is simply untrue. The project team was eager for an impartial group to form an intellectual and factual buffer with the client. The team helped select the external reference group so there would be a balanced representation of economic, social and environmental disciplines.³⁶ The group functioned well in session, but found it difficult to devote the sustained reviewing time necessary to achieve a technically competent overview on such a wide range of issues. After more than one year of inactivity, the external reference group was called on to add their individual perspectives in text boxes to the overview chapter at the very end of the project delivery.

On this particular topic, Paul Kelly seemed to be more eager to attack the authors rather than deal with the report's substantive issues. His journalism became extremely personal which suggested that his ideological beliefs may have been challenged. Alternatively it could suggest that his newspaper is more comfortable with an editorial line that sustained rates of population increase are possible and that these will have no negative environmental effects.

'If you add value to a sheep property,

then you can carry more sheep', he said dismissing the carrying capacity notion as primitive.³⁷

The above quote, attributed to Minister Phillip Ruddock, links farm development with carrying more sheep and then to the general concept of human population carrying capacity. *Future Dilemmas* did give some summary review to the notion of carrying capacity but nowhere in the report did we endorse the concept. It is simply not part of the CSIRO model, nor is it the philosophy behind it. Kelly's use and attribution of this quote reflects poorly on his knowledge base. While it is true that a well developed farm with a resilient production system is worth more in dollar terms, to suggest the higher the sheep number the higher the dollar value in the long term, is too simplistic and presents a static situation where every year has an average rainfall and technology alone is a major factor. The argument should also consider El Nino and protracted droughts where overstocked farms go to the wall economically and environmentally. In addition it should describe the causes of the salinity, and the acidification problems facing most of the wheat sheep belt in eastern and western Australia. These are due to the century just past where farming systems have been pushed to the limit by a complex layering of successive brilliant ideas until the land said, 'enough'. In a newspaper column one of Minister Ruddock's colleagues noted that 'occasionally in drought the sheep need to be culled or relocated to another paddock'.³⁸ Kelly goes on to say:

The report's defect lies in its refusal to incorporate the role of human choice and the reality that people will change their behaviour in response to new situations.³⁹

This comment suggests that Kelly may not have actually read the report. He

simply parrots the litany of complaints listed by Murphy and Woden. The workshop series that preceded the modelling and report writing were not focused on assumptions and on behavioural and policy responses. The workshop outcomes constitute a clear mandate from more than 300 experts effectively representing the most important physical sectors in the Australian economy.⁴⁰ The eventual implications of price changes (plus expected innovations in policy, technology and resources) were expressly factored into the scenarios after a wide ranging discourse. For example, to represent commodity trade effectively, the research group contracted a premier economics consulting group to run their economic trade models and provide a rational underpinning of future trade requirements in Australia's export industries. Nearly 20 sub-scenarios are presented in the report that applied innovation and policy choice to issues that were judged to be problematic. Many economic modelling frameworks implement these complex social/ technological judgements by running black box calculators that are essentially unseen by the analysts. On the other hand, the *Future Dilemmas* study employed the 'design' approach⁴¹ which ensures that deliberations are transparent and open, and conducted in 'decision space' outside the model and implemented as equations in 'machine space', once a policy and technical consensus had been reached. To be fair, both the physical and economic analytical approaches are required for robust policy deliberations. However for Kelly to assert that Minister Ruddock went on record with these criticisms calls into question the due diligence process that should underpin competent national journalism.

Foran wants air travel limited because of its energy excesses. He wants oil

and gas reserves kept in the ground for another 30 years and to cut export deals with China since we 'still don't know what the next fuel is'.⁴²

Unfortunately Kelly resorted to extremely selective quotation to support his own world view, as the quote above demonstrates. This quote on air travel came from a phone conversation with one of the authors which related to the substantial infrastructure changes that may have to take place if Australia is to deal effectively with some of the 'future dilemmas'. As an example, the author noted that if a very fast train network were implemented on the east coast it would carry people at 20 per cent of the current energy cost per passenger kilometre of air travel and rely on coal fuelled electricity (of which we have plenty) rather than jet fuel, which might become expensive if domestic oil stocks become constrained and have to be imported. 'Keeping oil and gas reserves in the ground' is a reasonable approach to maintaining the security of high quality energy over the next 100 years. Do Kelly's apparently cornucopian beliefs tell him that if we spend more exploration dollars we'll always find more oil? He would do well to read the regular reports on national petroleum stocks published by Geoscience Australia.

Ruddock saved this cash-short project by having his department commission the CSIRO to answer the question: What effect will different migration scenarios have on Australia's environment?⁴³

For anyone who has ever negotiated a research contract with a Federal Government department, this assertion may seem naive. In the end, the alleged 'saviour' paid directly in hard cash about \$140,000 and received contract deliverables conservatively costed at more than

\$500,000. At the same time, the futures group had four research contracts underway on other tasks with external clients who were paying over \$1 million in total. That such projects are always cash short is true enough. However to suggest that cash payments from the population analysis maintained the financial viability of the futures group is fanciful.

The Megalogenis article was preceded by a series of tough but fair phone conversations but he was focused on the message. We can only presume that this was because his world view and knowledge could not deal effectively with the issues posed by *Future Dilemmas*. Three examples of Megalogenis's journalistic approach are as follows:

The experts behind the water and population movement are from the same agency, the CSIRO. But the conflicting response to their work reflects the difference between the practical and the pious.⁴⁴

Megalogenis is referring to the work of the Wentworth group, a group of concerned scientists focussed on water issues. The use of wedge journalism to praise the environmental credentials of the Wentworth group, and to damn the 'dogma of science'⁴⁵ unleashed by *Future Dilemmas* is an interesting ploy. This is especially so given that the work of the Wentworth group scientists (and many others of similar standing) effectively underpins our physical economy modelling, specifically in the resource components that are critical for Australia's environmental future. If Megalogenis had read the report's water chapter more carefully, he would have noted the authors' views that Australia's presumed 'water crisis' was more or less under control in a long term sense and that 'it is assumed that the integrity of key water

catchment areas will be improved and that with appropriate regulation and technological innovations, high quality water supplies will be maintained for domestic use'.⁴⁶ Thus the work of the scientists who eventually formed into the Wentworth group was already well accepted by the Futures group. We assumed that their science would be infused into national policy considerations. Most other areas of the report have similarly, strong foundations and this knowledge base will play out over the next two decades. Megalogenis continues:

Also, as research team chief Barney Foran concedes, no attempt was made to figure out whether further immigration will make Australia smarter in dealing with the environment. Surely this is a critical variable in the population debate.⁴⁷

If Megalogenis had been less pressed by newspaper deadlines, he would know that one of the report's sternest critics, the economist Chris Murphy of Econtech,⁴⁸ had already underpinned the current immigration policy with seminal studies on immigration rates, skill levels and the possible effects on national productivity and economic growth. In a highly competitive globalised market for skills, Murphy found that Australia may have problems out-competing countries such as the US and Canada and that once immigration rates passed current levels then, by importing lower skilled immigrants, we would dilute the advantages gained by the currently highly skilled imports. As a general assumption, the *Future Dilemmas* study assumed that all jobs would be filled by appropriately skilled persons and that there would be little difference in skill quality between native born Australians and immigrants. Megalogenis says:

The science of the environment is still a

work in progress. A forecast about the next 50 years, which was the timeframe of the population report, may not be worth the trees killed to publish it.⁴⁹

All human endeavour should be seen as work in progress. The demographic routines that drove this work forward are the same as those that underpin national demographic projections and the same as those that gave rise to the Federal Government's *Intergenerational Report*.⁵⁰ This report anticipates a wide range of challenging policy areas as Australia's population ages and requires more health care and pensions. Would Megalogenis criticise the Federal Treasurer's report in a similar fashion, given that the *Intergenerational Report* actually did try to predict the future? In contrast, the *Future Dilemmas* report uses the analytical construct of *scenario development and testing* pioneered by Royal Dutch Shell⁵¹ which is the intellectual basis of Shell's flexible business advantage in a fiercely competitive global marketplace.

Overall, the journalistic approach used by three of the most senior journalists in *The Australian's* stable of writers seemed to be propelled by a visceral premonition that something was amiss within their well honed ideological world views. Alternatively it could be assumed that editorial licence allows them to downgrade a national study that tested options, drew lessons from the future, and crystalised important policy challenges. Where *Future Dilemmas* was based on transparency, data and referenced information, quantitative equations, and a wide social and scientific discourse, journalism's top opinion makers resorted to devices best left to the tabloid press and their assertions were further compromised by a series of glaring factual mistakes.

THE WAY FORWARD

In spite of these and other criticisms, our overall assessment of the *Future Dilemmas* study is that it remains highly successful. The reaction of officials in the Federal Government is as yet not forthcoming but the document is on many desks and bookshelves and there is a regular trickle of enquiries from agencies that want the 'future dilemmas' framework run over their policy domain. There is a steady stream of presentations for state government departments who would like to mount this capability for their own strategic planning purposes. We might have anticipated that Australian business interests would have been displeased with an airing of so many potential areas of concern. However, in the best tradition of marketplace dynamics, many business leaders have seen *Future Dilemmas* as providing opportunities for more work and investment. The debate at business lunches where the authors talk is vigorous and frank. However, at the end of lunch, most debaters drop their card into the hat for the free copy to be sent by the following Monday.

Perhaps most of the unintended consequences were played out at the greener

end of the spectrum. Mischievous headlines such as 'We'll be right with 50 million',⁵² may have made the ecological debate on population policy more difficult. However, from the authors' perspective, there is now a huge amount of well wrought analysis to underpin many facets of the population environment debate. The report is out there rather than hidden in a bureaucratic filing cabinet, which was potentially its fate. Well focused criticism of the report and its methods, and the right of reply to that criticism, can only take the population environment debate forward. The authors look forward with anticipation to the next hard-fought test series.

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