

NOTES BY JOHN C. CALDWELL (DEMOGRAPHER) ON COLIN D. BUTLER: POPULATION AND ENVIRONMENT IN AUSTRALIA: 2003

The following are my first hasty reactions to the report.

1. The report is balanced, perhaps more sympathetic to the environmentalist case, but certainly not outrageously so. Its strongest theme is the need for more research, a position almost instinctively supported by researchers, but justified in this case by the fact that the future of the human race is deeply involved and some important political decisions may have to be made in the near future. Scientists are justified in backing certain decisions only if they have not only carried out first-class research but also devoted time and effort to pressing governments for funding and the establishment, where required, of new programs and institutions.
2. From the viewpoint of the demographer there are several additions that could be made to the report i.e. various related demographic phenomena that give perspective to the whole debate. That perspective is important because the greatest threats to Australia come from global population changes affecting other global systems, not our immigration policies.

The first is that there has been remarkable success in limiting the growth of global population, which will probably peak at around nine billion before the end of the present century and then decline (possibly passing on its way down our present population by the end of the 22nd century). The need for controlling population growth (through the reduction of fertility) only became clear after the Second World War, because medical breakthroughs, the internationalization of health programs, and social change brought down mortality levels much faster than had been thought possible and showed that there was no tight relationship between per capita income and longevity. Attempts to bring down Third World fertility did not even begin to succeed until the 1960s but then better contraception, changing government and individual attitudes, and national family planning programs began to work. Only recently has it been realized that the maximum global population might be constrained to under 10 billion, and even under 9 billion. It was impossible to move faster than this because many poorer rural families were still threatened by high and capricious child mortality and desperately needed their children's labour. Much of the international support for family planning at the time was based on the belief that slower population growth would mean faster increase in per capita income (not yet completely proven to be true). Probably the stronger case is that, although there was reassuring evidence that the world probably could at first feed ten billion people, we did not know what impact a richer population of that size would have in the indefinite future on the stability of global systems.

The second phenomenon, completely unforeseen and partly offsetting the impact of huge population growth, was that the countries furthest advanced in fertility decline did not cease that decline at stationary population levels but continued well below replacement so that, as measured by the net reproduction rates, 44 per cent of the world's population now live in countries with below-replacement level fertility (comprising nearly all developed countries — except the United States which is marginal — China, and a range of other smaller countries). If longitudinal (cohort)

measures are employed the extent to which they fall below replacement level is not as marked, and, in any case, most countries will not have immediate population declines because of population momentum (the time taken for the age structure to change so that the proportion of potentially fertile women is reduced to its long-term level). This unexpected situation occurred in the developed world because most women now worked for wages, thus making child birth and rearing difficult, attitudes changed as the battle against high Third World fertility was interpreted as meaning that few or even no children was the right moral decision, and better contraception was invented. There is little doubt that low fertility will spread to the whole world, so that most countries and the world as a whole will have falling populations by the end of the present century.

The third is that such low fertility means that global population will peak rather than plateau. We probably will have to think of ensuring the stability of world systems with a global population above six billion not forever but perhaps for less than two centuries. We may have time later to repair the damage caused during the high-population era.

Fourthly, the relativity of population and per capita economic growth will change as population growth slows. In 1970 their impacts were similar, both increasing at around 2 per cent per annum, but around 2050 per capita economic growth is likely to be ten-fold greater than population growth and towards the end of the century infinitely greater.

Finally, there is an unknown factor which might or might not be important. The governments of at least some of the developing countries may react ever more strongly to declining population. After all, at present rates, countries like Germany, Italy, Spain, Russia and Japan will halve their populations during the present century. This will possibly result in a strong nationalistic reaction with extraordinary attempts to change attitudes back to favouring large families and costly institutional and financial bribes to do so. This might well not work either because calmer councils will prevail among governments or because the imperatives of an advanced industrial economy make the population heedless. Some of the governments' efforts may be socially to the good (i.e. better working and childcare conditions for women both at work and in the home) and may be accepted without greatly — or even appreciably — raising the birth rate. If the policies meet the success there may be a chain reaction through developed and even developing countries, so that the gains from declining fertility are lost. The English-speaking countries of overseas European settlement (i.e. USA, Canada, Australia and New Zealand — what Angus Maddison calls 'the Western offshoots') have always been immigrant countries and may largely settle for replacing the increments of natural decrease, or achieving modest population growth, by immigration and may be economically and socially sensible to do so.

3. Assuming that Australians will not favour declining population, continued immigration will be needed. The Australian Bureau of Statistics has produced three detailed population projections: in Series III (TFR = 1.6, i.e. the average final number of children per women at current age-specific fertility rates; net annual immigration = 70 thousand) population begins declining around 2050; Series II (TFR = 1.6, immigration = 90 thousand) does not decline until 2060; Series I (TFR = 1.75; immigration = 110 thousand) still shows positive but low population growth at the

end of the century at 0.2 per cent. In the three series, population peaks before declining at 24.1 million, 25.5 million and well over 30 million respectively.

4. 'Carrying capacity' and its earlier formulation 'optimum population' have been around since Edwin Cannan's work almost a century ago, but attempts to employ the concept have failed. If it is defined — as it was not earlier — as causing no further environmental damage or loss of species it will still fail. There will be some loss and some change even if both population and economic growth were stationary. There has already been environmental change for tens of thousands of years. Economic growth does not necessarily place the greatest pressure on the environment, although it may on some resources. Rich, well educated, highly urbanized societies, with only a limited commitment to economic rationalism, can afford to take stronger actions to limit environmental damage, especially to soils and natural landscapes, than societies of poverty-stricken peasant farmers.

5. Further work on the population-environmental frontier will need to be as scientific as possible. Although Maurice King (especially on his website) continues to charge demographers with collusion in understating the impact of population growth, the strongest recent attacks from within the profession have been on demographers who are charged with having lost their objectivity during the 'population explosion' period and to have become ideologues instead of neutral observers. Similarly, environmental science will be most valuable if its main commitment is to good science. When Pat Caldwell and I immersed ourselves in the environmental literature on sub-Saharan Africa and South Asia for a report to a meeting of the New York Academy of Sciences, we followed chains of footnotes in reputable environmental journals through to their origins and were surprised how often they started in an assertion or a speculation with no empirical work at all. Part of the problem is the lack of well-measured longitudinal studies of environmental change and population growth.

The integration of demographic and environmental research is needed but is difficult. The demographers' international organization, the IUSSP (International Union for the Scientific Study of Population), failed to renew the mandate for its Environmental Scientific Committee after it found that the environmentalists wanted little from the demographers except population projections and that the environmentalists and demographers did not propose new empirical research in the way the other scientific committees did. In retrospect, I think we should have persisted with the attempt.

During the period when many demographers were deeply immersed in fertility-control experiments, there was a hope that industrialized countries were not foisting fertility control on developing countries at complete odds with their traditions, and that it could be shown that societies had deliberately trimmed their numbers to resources even in palaeolithic times. Accordingly a literature claiming such avoidance of Malthusian controls emerged from the anthropological-demographic borderland. The production of such literature is now less plentiful and scepticism about the earlier findings have emerged.

6. A few minor comments on the Butler report:
- a. It is a thorough and impressingly inclusive report.
 - b. Without published papers I find it hard to understand Figure 3 and its successors. If the 'affluence proxy' is the product of global population and life expectancy, surely this is double dipping in that the size of the population already reflects greater longevity? Does the 'environmental proxy' really remain positive until 2075?
 - c. P17. Surely migration can be adequately explained by current higher living standards rather than the potential for increased living standards?
 - d. P18. Any amount of demographic research shows that fertility control and resultant population slowing is the product of growing aspirations and not awareness of limits to growth.
 - e. P23. Per capita natural capital has been falling for millenia not decades.
 - f. P29. 'Most populations in the Asian region will continue to become larger and younger compared to Australia'. Comparing the whole Asian region with Australia, the United Nations medium population projections, show Asia's median age falling below that of Australia in the 2030s and Asia's rate of population growth falling below Australia's after 2040.

A few selective and personal references:

Australian Bureau of Statistics, *Population Projections* (regular intervals).

United Nations, *World Population Prospects* (biennially).

Peter McDonald and Rebecca Kippen, Population futures for Australia: the policy alternatives, Parliamentary Library Research Paper 5 (1999–2000).

John Caldwell and Bruce Caldwell. 2003. Pretransitional population control and equilibrium, *Population Studies* 57(2): 199–215.

Bruce Caldwell and John Caldwell. 2003. Below-replacement fertility: determinants and prospects in South Asia'. *Journal of Population Research* 20(1): 19–34.

John Caldwell and Pat Caldwell. 1994. Rapid population growth and fragile environments: the sub-Saharan African and South Asian experience, in K.L. Campbell and J.W. Woods (ed.), *Human Reproductive Ecology*, New York Academy of Sciences, pp. 355–371.

John Caldwell. 2001. The globalization of fertility behaviour, *Population and Development Review*, vol. 27, *Global Fertility Transition*, ed. Rodolfo A. Bulatao and John B. Casterline, pp. 93–115.