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Science, technology and wellbeing

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SCIENTIFIC UNDERSTANDING of the world has enabled us to improve material wellbeing on a scale that previous generations would find difficult to believe. For all but the last few decades, most humans have struggled to obtain the basic necessities for a civilised life: clean water, sanitation, adequate nutrition, shelter and health care. Now, the majority of the human population has all those basics as well as such luxuries as energy, transport and communications. These improvements in our material wellbeing have been made possible by our growing scientific understanding and our increasingly powerful technologies. These have also enabled significant improvements in our mental wellbeing by freeing us from some kinds of stress and giving us much better access to culture: music, literature and drama.

Of course, we don't live in a utopian world where everybody lives fulfilling and comfortable lives. Several hundred million people are still hungry, about a billion don't have clean drinking water, and many more don't have sanitation. While there are obvious concentrations of these problems in the world's poorest countries, there are pockets of deprivation and desperate poverty in even the richest countries. We now know that poverty and inequality both have measurable health impacts. Up to average income levels of about $5,000 per year, there is a clear relationship between income and life

expectancy; in poor countries, people die prematurely because they can't afford clean water, adequate nutrition, decent shelter or basic health care. Above that level of average income, there is no relationship at all between income and life expectancy, but there is a clear correlation between inequality and health. People do not live as long in unequal societies, partly because there is more violence and crime, partly because of the impact on mental health and wellbeing of constantly feeling underprivileged. The United States has the highest average per capita income of OECD countries, but is also the most unequal — and it has the shortest life expectancy of those affluent nations.

Contemporary economists generally put their trust in economic growth to solve these problems: 'a rising tide lifts all boats' is the mantra. The economic growth of recent decades has not lifted all boats; one observer noted that it only floated a few luxury yachts! In fact, the rapid economic growth of recent decades has been widening the gap between affluent and disadvantaged, both within and between nations. There is a more fundamental problem in trusting growth. We now face problems of resource depletion. Some of these problems can be alleviated by wealth. For example, paying more for transport fuels has made marginal oilfields viable. In 1970, the oil price was below $2 a barrel; today it is over $100. But no amount of willingness to pay will increase the world's mineral stock.

The geologist M.K. Hubbert showed in 1956 that US oil production would peak in the early 1970s and then decline; when this prediction proved accurate, the same approach was used to show that global production of conventional oil would peak about 2010 and then decline. In fact, the peak of conventional oil production has occurred. Supplies are being augmented by oil from rocks under deep ocean water, from northern polar areas and gas condensates, but most experts believe the overall peak will happen this decade unless we accept the massive environmental costs of resources like tar

sands and oil shale. Although there is solid evidence for 'peak oil', most transport planning still implicitly assumes unlimited petroleum fuels. Given the timescale for changing urban transport systems, we are likely to face significant disruptions in coming decades as petroleum fuels become much more expensive or limited in availability.

More generally, it was shown in the early 1970s that there are limits to the scale of resource use and productive economic activity that the natural systems of the planet can accommodate, but 40 years later most decision-makers behave as if limitless growth is possible. The 'standard world model' of *The Limits to Growth* was based on extrapolating the growth trends that existed in 1970.[1] It led to economic and ecological decline in the early to middle decades of this century. Recent comparisons with 40 years of data show that we are still on that gloomy trajectory. Four reports on the state of the Australian environment have shown we have serious problems; five reports on the global environmental outlook documented the crisis at the global level, highlighted by the dramatic decline in biodiversity. Despite these detailed explanations of the environmental issues we face, decision-makers still behave as if the problem caused by growth in human consumption can either be safely ignored or, even more improbably, solved by more of the growth that is causing the difficulty.

The most urgent environmental problem is global climate change. The science has been clear now for decades; human activity, burning fossil fuels and clearing vegetation, is increasing the atmosphere's capacity to trap heat and changing the global climate. As well as increasing average temperatures and more very hot days, we are seeing changing rainfall patterns, more frequent and severe extreme events, retreat of terrestrial glaciers, melting of the Arctic sea-ice, and changes to the distributions of plants and animals. Despite the overwhelming weight of evidence, some intelligent people are still denying the

link between human activity and the changing global climate. The technique of Causal Layered Analysis (CLA), developed by Richard Slaughter and Sohail Inayatullah in the context of futures studies, explains why many decision-makers refuse to accept the evidence.[2] Essentially, it concludes that denial is an understandable response when truths are in fundamental conflict with the myths or metaphors people hold. When those myths or metaphors are so widespread as to constitute the underlying ethos of the society, continued denial is the norm.

Most political discussion is at what CLA calls the litany level, over-simplified and superficial, often based on simple slogans: 'we will stop the boats', 'a better deal for working families', and so on. Discussion of climate change in the United States, Canada and Australia is often couched in these over-simplified terms, portraying the science as a matter of 'belief', as if it were an alternative religion, or belittling the motives of those who present the scientific data. Some analysis does go deeper and looks at social causes, occasionally even offering practical solutions that treat the disease rather than its superficial symptoms, but almost all public discourse ignores the myths or metaphors underlying the discussion: what Inayatullah has called 'the unconscious dimensions of the problem'.

In those terms, some obvious deep-seated myths underpin our civilisation. One is the notion that progress is inevitable and that growth is either inevitable or desirable, seen as the hallmark of progress and the bringer of wealth and happiness. Challenging the myth of growth is tantamount to heresy, despite the evidence that the unprecedented affluence of recent decades is not improving our wellbeing. The very title of the report *The Limits to Growth* might have been chosen to provoke the response it received: shock, disbelief, and attacks that belittled the intelligence of the authors and questioned their motivation. The real world is complicated, and growth brings benefits as well as problems, but the deep-seated belief in

growth means that the benefits are hailed and the problems ignored. An interesting example in recent Australian politics is the rising cost of electricity. About 70% of the cost increases in the last decade is attributable to expanding the network to provide for the growing population, because Australia has an unusually high rate of population growth. Because it is heresy to question growth, political discourse blames the price rises on the increasing use of solar panels, even though they provide peak electricity at a lower marginal cost than large power stations, or attacks the modest carbon price which probably accounts for about 5% of the price rises.

A second underlying metaphor is the notion that we are not citizens but consumers; in a morally deficient and spiritually bankrupt society, we are urged to find fulfillment in consumption. This is an extraordinary metaphor: the individual as 'stomach'. We don't use resources, we consume them. This is not a weakness, but almost a social and economic duty: consume and take comfort in the fact that you are helping the economy to grow. Experts lament any decline in new car sales or spending on tourism, as if these were indicators of social decay rather than rational choices about spending scarce resources. Dr Paul Raskin, head of the Boston-based Tellus Institute, has argued that consumerism has been one of the triad of dominant values for the last century, along with 'domination of nature' and individualism.[3]

The concept of domination of nature arises from our capacity to transform the world and enable unprecedented material comfort for billions of people, but it is based on indefensible hubris about our understanding of natural systems. The first Australian report on the state of the environment estimated that only 10% to 15% of the species that inhabit the continent have even been identified, so the notion of 'management' is clearly fanciful; a parallel would be trying to manage a football team when you have only met one of the players and

have no idea what skills the others have or how they might interact. The idea of 'sustainability science' emerged from recognising that many serious environmental problems are the direct result of applying technical knowledge to part of a system, ignoring the wider consequences. Reservoirs are built to impound water and allow irrigated agriculture, but this causes soil salinity in the irrigated areas and disruption to the riverine ecosystem. Chemical attacks on pests cause flow-on effects up and down the food chain. Flood mitigation works expedite the flow of water downstream, transferring the problem to a different postcode. Expanding the capacity of a road generates traffic and creates predictable problems elsewhere in the system. Using enormous quantities of fossil fuel energy has enabled us to live at a standard of material comfort that previous generations could only dream about, but the consequence is that we are changing the global climate. Raskin argues that the metaphor of domination of nature now needs to be replaced by the concept of ecological sensitivity, recognising that natural systems have critical limits and accepting the responsibility to live within those limits.

Individualism has been the basic metaphor underpinning the winding back of services provided by governments in favour of the expectation that individuals would fend for themselves. The English-speaking democracies have gradually reduced the government share of the economy in favour of 'opening up opportunities' for the private sector. Many services which were previously owned publicly have been sold in recent decades: electricity and water supply, airports and airlines, transport services and so on. Even though there is no evidence of any community benefit from this approach, we still see today calls for the sale of remaining public utilities such as postal services and public broadcasting networks, as well as those vital supplies such as water and electricity that are still in public hands. In the modern world, we are increasingly dependent on

others for essential services; very few of us grow our own food or collect our own water. So we need to think in terms of a shared future with our fellow humans. We are all in this together.

In the specific issue of population, ecologists have been warning for nearly 50 years that the growth in the human population constitutes a direct threat to the capacity of the Earth systems to support other species. The population continues to grow about 80 million a year. Australia has one of the highest rates of growth of any affluent country, putting pressure on both natural systems and built infrastructure.

All this analysis shows we need a more sophisticated approach to wellbeing. Trusting science and technology to grow the economy is not working. We need to focus on what brings us fulfilment, as individuals and as members of a community.

Endnotes

1 DH Meadows, DL Meadows & J Randers, *The limits to growth: the 30-year update*, Chelsea Green, VT, 2004.

2 S Inayatullah (ed), *The Causal Layered Analysis (CLA) reader,* Tamkang University, Taipei, 2004.

3 P Raskin, *The great transition today: a report from the future,* Tellus Insitute, Boston, 2006.

Further reading

J Diamond, *Collapse: How societies choose to fail or survive,* Penguin Group, Melbourne, 2005.

I Lowe, *Bigger or better? Australia's population debate*, University of Queensland Press, Brisbane, 2012.