Nature&Society

The Journal of the Nature and Society Forum

April - May 2013

Editorial

We are a talkative species. We'll talk to ourselves, our pets, our cars, or maybe a tree or an obstacle we have just fallen over. But people generally, when writing or talking to other people, usually intend to communicate with those other people. It always comes as an unpleasant surprise to discover that, however clearly you thought you had expressed yourself, the reader or listener has received a different message from the one you had intended.

This misunderstanding comes about because the recipient of the message interprets what they hear in light of their own preconceptions, prejudices, preoccupations and life experiences. That is why when people share their thoughts with others, they find they can communicate easily with those who already share much the same ideas, but that communicating with many other people is difficult to impossible. No matter how simple and clear your exposition, it seems that the other person is wilfully misunderstanding you.

There is no very good way around this sort of obstacle, but good will and an intention to really listen to what the other person is saying, is an essential prerequisite. We have to always remember that what we have said has been moderated by our own experiences of the world and someone else may have a completely different understanding. You can never be absolutely certain that what you see, hear or experience is the same as what your hearer has seen, heard or experienced.

Included in the February/March issue of *Nature and Society* there was a short piece entitled Seeing Blue, about perception. It was probably the most important item in that issue, but I know that it escaped the notice of many readers, so I shall repeat part of it here. It started from the fact that in some ancient societies, literate, advanced civilisations such as the Greeks, the population could not see the colour blue. This seems amazing, particularly given the famous blueness of the Mediterranean Sea and its sky.

It was not because those people lacked the blue colour cone which enables us to see blue. It was because their language did not contain a word for blue – probably because no naturally occurring food is blue, few flowers were really blue before plant breeders took on that challenge, and blue pigments are rare, and were certainly unknown to them at that time. Blue was simply unimportant. Red, yellow and green are important in determining the ripeness of fruit, and appear also in other natural objects which you can touch, so they got named. Blue was different. You can dye

> *… in reality we already have sufficient evidence, including unprecedented physical events, that if we wanted to believe, we would. The urge to deny unwelcome reality allows people to ignore any amount of data that challenges them – until they are ready to change. Then the evidence is obvious and accepted. So while facts are necessary, they are not sufficient. We will respond not when we accumulate an overwhelming amount of evidence – we already have that – but when we stop denying the significance of the evidence we already have.*
> *Then there will be a tipping point when denial ends, and the reality that we face a global, civilisation-threatening risk will become accepted wisdom, virtually overnight. At that point, we will respond dramatically and with extraordinary speed and focus.*
>
> *Paul Gilding,* The Great Disruption*, 2011*

Contents

NSF news	3-8
e-journal and print version	4
Biounderstanding and ecological survival	4
The global food crisis	5-8
New Biosensitive Futures pamphlets	8
Deconstructing windfarms	9-11
Book review: *The Great Disruption*	12
Good news on human population	13
Farrago	14-15

your feet green when you dance on lush grass, but you cannot dye your feet blue when you paddle in the ocean.

So our language reflects our experiences and what is important to us. We now have far more words than ever before, and new words are sprouting all the time, but most of us have our own more limited vocabulary. Worse, we each develop our own understanding of words which could be rather different from the understandings of other people. So knowing what the other person is really saying can be tricky.

Today we are dogged by the common misconception that an economy must be growing or it is failing in its job. This is despite the fact that the famous fathers of economics themselves said that economies should stop growing. John Stuart Mill recognised the necessity and desirability of moving towards a 'stationary state of capital and wealth' which he added would not imply a stationary state of human improvement, a very important point.

Because this idea of growth as progress is so deeply embedded in our culture, many people have great difficulty in recognising that growth is not of itself good. They may recognise that there is such a thing as bad growth in the case of cancer, or obesity, but in general growth is good.

That paradigm is so embedded in the culture that most of those in power simply cannot see anything else. Individually they may understand that we are running a world in which there are more starving people than ever before, causing massive extinctions, or depleting water sources, but the answer to everything is more growth. They simply cannot see that it is growth itself which is a major cause of all these and many other problems. To doubt growth is impossible.

...the military has a term for how highly dubious ideas become not just accepted, but viewed as certainties. "Incestuous amplification" happens when a closed group of people repeat the same things to each other – and when accepting the group's preconceptions itself becomes a necessary ticket to being in the in-group. A fundamentally flawed notion – say, that the Germans can't possibly attack though the Ardennes – becomes part of what everyone knows, where "everyone" means by definition only people who accept the flawed notion. We saw that in the run-up to Iraq, where perfectly obvious propositions – the case for invading is very weak, the occupation may well be a nightmare – weren't so much rejected as ruled out of discussion altogether; if you even considered those possibilities, you weren't a serious person, no matter what your credentials. ...
And at this point, of course, all the Very Serious People have committed their reputations so thoroughly to the official doctrine that they almost literally can't hear any contrary evidence.

Paul Krugman
New York Times, 29 January 2013

This is a very important factor that is impeding any movement to develop new economic systems which can accept the end of material growth. Changing that mindset is incredibly difficult. Just telling people the facts as we know them is not going to change their minds.

It is going to take many different approaches, many new experiences to reset their minds. What will work for some will not work for all. Some people can understand academically, theoretically. Others need a much more personal experience, or a series of experiences, showing them that life can be better if it is differently organised.

Paul Gilding says there are five ways to well-being. One is connecting with other people, another is being physically active. We also need to take notice of the world around us, learn new things, and give to others. These are the sort of things that community gardens, bird-watching, volunteering, land care, and many others can supply. The more people who get involved in such groups, the better primed they will be to understand and undertake the massive reformation our society needs to undertake.

Jenny Wanless

Humanity's war against nature

We still talk in terms of conquest. We still haven't become mature enough to think of ourselves as only a tiny part of a vast and incredible universe. Man's attitude towards nature is critically important simply because we have now acquired a fateful power to destroy nature. But man is part of nature and his war against nature is inevitably a war against himself.

Rachel Carson, quoted by Paul Gilding in *The Great Disruption*

Nature and Society

Editor: Jenny Wanless

Publisher: Nature and Society Forum

ISSN: 1038-5665

Nature and Society© is the journal of the Nature and Society Forum, GPO Box 11, Canberra ACT 2601, and is published six times a year.

Tel: +61 (2) 6125 2526

E-mail: office@natsoc.org.au

Websites: www.natsoc.org.au

www.biosensitvefutures.org

Where we are

The Forestry Building of the Fenner School of Environment and Society at the ANU.

From the building's entrance, turn left past the School's office and our office can be found on the right at the end of that corridor. But ring before coming as the office is occupied irregularly.

By car: There is very limited meter parking 200 metres to the north, near Union Court.

By bus: The route 3 bus from Civic drops you in Daley Road. Walk 100m south-east to the Forestry Building.

By bicycle: Abundant bicycle parking just outside our office.

Dave Foreman on population

While Western countries drop their fertility rates to live within their carrying capacity, third world countries dominated by the old religions, continue to produce that excess of 80 million people instead of using birth control. Thanks to the Catholic, Islam, Hindu and other churches, their members gallop onward to ever greater numbers.

Once they outrun their own countries' ability to feed, house and water those newcomers, they escape to First World countries where they arrive "for a better life." Unfortunately, that migration ensures more baby production in the country they left behind and multiplies their "ecological footprint" not only in their new country, but more so in their old country with more human babies. The vicious cycle repeats, but who loses habitat? Answer: wildlife.

Coming NSF meetings

Wednesday 17 April 2013: *Simon Sheik on Activism in the Twentyfirst Century* 7:30-9:00 pm at the ANU's Frank Fenner Building, corner of Daley Road and Linnaeus Way.

Getting community action on issues that matter.

Simon grew up in a public housing estate, and was primary carer for his mother who suffered from a mental illness. He studied economics at university, and then worked in the NSW Treasury. He is very well known from his work with the online advocacy group GetUp. He is particularly interested in issues such as social justice and the wellbeing of communities.

He will have much to tell us about activism and how to get a message across to the public.

Simon is the Green Party's candidate for the ACT senate seat at this year's federal election.

Wednesday 15 May, 2013: *Discussion forum – Fossil Fuel Damages - Who Pays?* .7:30-9:00 pm at the ANU's Frank Fenner Building, corner of Daley Road and Linnaeus Way.

A public forum hosted by the Nature and Society Forum in conjunction with several other organisations, to be moderated by Peter Tait and Walter Jehne.

Almost 250 years ago Adam Smith wrote that valid price signals are critical to the functioning of capitalism, in order to limit excessive exploitation of finite resources. Such price signals have been noticeably absent in recent years. Instead governments have been anxious to increase mining, to provide jobs and 'grow the economy'. A token carbon tax has been the only attempt to sheet home the responsibiluity for carbon dioxide emissions, despite the fact that the rest of the economy will have to pay heavily for mitigation of climate change, damage to farmlands and much more.

President Obama, in his inauguration speech said "Some may still deny the overwhelming judgement of science but none can avoid the impacts from raging fires, crippling drought and more powerful storms." Prices must reflect the full cost of the extraction of fossil fuels and their damaging impacts, so that consumers can make informed decisions, and take responsibility for all their costs. What were formerly regarded as *externalities* must be paid for as *internalities*, so that the correct signals are sent to the market, and industry pays for its actions. How can society effect such a change?

NSF news

Nature and Society Forum e-journal

This edition is the first in which the default edition of *Nature and Society* is electronic. The electronic version will make it easier for members to forward copies of articles - or even the full journal - to friends and acquaintances and we hope you take advantage of this facility. Our copyright certification does not impede in any way the spread of this publication. The copyright is designed to ensure that individuals do not profit by copying our work for their profit and that NSF's work is used by academic and other institutions on the same basis as other comparable publications. We have canvassed all members without internet access and will be sending them a printed version by post, but this will be 'stapled top left' rather than printed professionally - as we have done for almost twenty years. We recognise that some members would prefer to read *Nature and Society* in the old format, but we simply cannot afford to do this any longer. *Nature and Society* was always intended to contribute income to NSF, but it has become a drain on our resources as printing and postal costs have risen and as we have lacked volunteers to assist regularly in its production and distribution. On balance we are pleased that we will be saving paper in respect of most members, that we are making it easier to 'spread the word' (electronically) about the need for biounderstanding and how this might be achieved and that this journal should continue to serve its valuable function of contributing to the recruitment of new members to the Forum.

Jenny Wanless, editor

Individual and group selection

Although a high standard of morality gives but a slight or no advantage to each individual man and his children over the other men of the same tribe…an advancement in the standard of morality will certainly give an immense advantage of one tribe over another.

Charles Darwin, *The Descent of Man,* 1871

Materialism infers that the human brain evolved in a similar manner to that of the other organs and that humans, similarly, evolved from other animals. The only conclusion to be drawn from this fact is that if the brain has a material basis, so does the human mind, including religious beliefs. And this in turn leads to the inescapable conclusion that the notion of a deity is simply a product of the human mind. In this light, the present day arguments of creationists and 'intelligent design' proponents can readily be seen as feeble attempts not only to refute evolution and impose irrational religious belief on everyone else, but ultimately to rebut materialism, per se.

Lorna Salzman, Politics as if Evolution Mattered, 2012, p 10

Workshop on biounderstanding and ecological survival

NSF's February meeting

This was a well-attended meeting, with a number of our own members as well as representatives of other groups present. Stephen Boyden outlined his ideas on biounderstanding and his contention that our society will not make the changes needed to achieve sustainability until there is a general understanding of the human place in nature. He asked if those at the meeting agreed with him, which we did whole heartedly. We need a profound change in the dominant culture. Then how can we promote such understanding?

People present rapidly came up with a number of actions, such as using social media for mass communication, having workshops for parliament-arians, getting knowledge of our relationship with nature incorporated in education at all levels.

Stephen was rather disappointed that in general people backed the need to build on the types of actions already being taken by the various groups represented at the meeting. As these do not seem to be making the major changes we need to achieve, he wanted something new.

In reply to this lack of effectiveness, those who study the art of achieving change have pointed out that a lot of groundwork needs to be laid before the desired change occurs. Beckhard's Change Equation summarises it this way: Dissatisfaction plus Vision plus First Steps need to be greater than the Resistance to Change. Currently the resistance to change is much greater than the other factors – so much greater that most of society does not see a need to change. They imagine we can keep the present system and just tweak it to achieve sustainability.

In fact all the present activities of environmental and social change groups present at the workshop are laying the essential foundations for change. They

are working at getting society to realise that the current system is not working well, inequality is getting worse, the environment is being destroyed, famine and water shortages are getting worse, the list of ills keeps growing.

That is, they are working at the Dissatisfaction, but they are also working at the Vision, the idea that there are better ways to do things. They are also taking the First Steps. Once D, V and F are big enough to overpower Resistance, change will happen. In fact, although Gilding does not mention the Change Equation, his book is very much along these lines.

So greater understanding of the human place in nature is essential, but many different approaches are needed in order to get society to that point. There cannot be a one size fits all approach to achieving sustainability: a multi-faceted approach is needed because different people have different understandings and start from different points of view.

Jenny Wanless

We will also, I believe, take a more serious look at our place in nature. Exalted we are indeed, risen to be the mind of the biosphere without a doubt, our spirits capable of awe and ever more breathtaking leaps of imagination. But we are still part of earth's fauna and flora. We are bound to it by emotion, physiology, and not least, deep history. It is dangerous to think of this planet as a way station to a better world, or continue to convert it into a literal, human-engineered spaceship. Contrary to general opinion, demons and gods do not vie for our allegiance. We are self-made, independent, alone and fragile. Self-understanding is what counts for long-term survival, both for individuals and for the species.

Edward O Wilson, New York Times 24 February 2013

The dominant culture

What are the threats to biological and cultural diversity? They are worldwide and spreading rapidly: in addition to militarism and economics [...], they are uniformity (food monocrop culture), behaviour conformity (needed to maintain the power and legitimacy of entrenched elites), mass culture (needed to spread common-denominator non-threatening values, stimulate consumption and discourage heresy), technology (to eliminate self sufficiency and self-determination and create dependency), genetic manipulation (to insure homogeneity, pre-empt demands for environmental cleanup, allow corporate control of basic genetic resources for food and medicine, and facilitate social engineering experiments by the scientific elite), and the dominant role of the central state (to mandate and enforce all of the above).

Lorna Salzman, *Politics as if Evolution Mattered*, 2012, p 39

The global food crisis

Report of NSF's March meeting

Julian Cribb, science writer and author of *The Coming Famine*, (2010), has been stirring up debate on the future of the world's food supply as the human population continues to grow. Too many people think agriculture will be able to cope, by reinvigorating the green revolution, or by genetic crop manipulation, or some other tweaking. They fail to recognise that modern agriculture has coped with our expanding numbers by effectively turning oil into food, with large scale mechanisation, the manufacture of artificial fertilisers, and the transport of food on a massive scale around the world. In Australia alone distribution of food requires 80,000 truck movements per week.

Food production has been using 30 per cent of global energy. Meanwhile the production of new cars has been growing at eight per cent per annum, but new oil discoveries have only grown about 0.7% p.a. So oil is in very short supply.

We are in fact running out of everything that enables our present agricultural system to work. The list includes water, land and nutrients. The human world has never experienced such a wide spread crisis as the one that is about to unfold.

Ground water mining shows that many areas are in deep trouble, with water supplies in some areas in China and in the western USA expected to be exhausted in the near future. Seven Asian countries are withdrawing ground water more quickly than it is being replenished. Disappearing lakes, rivers and glaciers show that fresh water supplies are very precarious.

We are running out of land itself. There is a colonial land grab in progress, with wealthy investors displacing poor farmers, driving them off the land, especially in Africa. The Chinese are buying up land in Africa and Australia to try to ensure their own supplies, not to boost our economy.

Sea level rise will inundate deltas and other low lying land, often the most fertile soil on earth. Good food

growing land is being buried under spreading cities and roads. New megacities are being built to house growing populations. In addition we are degrading land on a huge scale with our food production.

We are flushing nutrients down our sewers and rivers, leaving them to settle out in the deep oceans where they will play no future role in our food supply. We also throw away up to half our food supply, wasting the nutrients embedded in it. Food is largely dependent on a supply of phosphate – and the world's supply is located in Morocco, so it could be disrupted overnight by instability in just that one country.

We passed peak fish in 2004, and have only kept up the supply by fish farming – which in turn depletes the oceans as farmed fish are often fed on fish meal, produced from less desirable fish species. We have a knowledge drought, with far too little research being carried out into food production, which should be one of our most important areas of research. Then there is climate change, with about a ten per cent drop in food production for every one degree rise in temperature.

Throughout history food shortages have led to food riots, with resultant political upheavals, prominent examples being the French revolution and the current Arab Spring. Governments ignore threats to the food supply at their peril. Modern military organisations seem to be much more aware of the threat than civilian authorities, and are factoring in the probable effects of climate change and food insecurity.

With our short-sighted modern 'efficient' economy, food and oil are not stored for future security, but are supplied on demand. Any disruption would see us with only enough to last a few days, and the probability of food riots as soon as supplies run out.

So with food such a big challenge, what should we do? Julian suggests reinventing the food system. We need to reinvest in research and development. We also need to reinvent the global diet, taking into account all the above problems. This will also mean redesigning cities especially to recycle water, waste food and nutrients and to grow their own food.

Our existing diet is, and has been for a long time, very poor. We have been eating a very narrow range of foods, dressed up to present an appearance of variety, but essentially made from a restricted range of ingredients – a handful of different grains, a limited range of fruit and vegetables, meat provided from a restricted range of animals.

We need to create a new diet, one sourced from both eco-farms, and factories. Already urban farms are supplying somewhere between 30 and 50 per cent of our food. Now people are experimenting with vertical farms and forests. These are sited near the sources of recyclable nutrients and water from the cities' wastes.

Aquaculture is becoming more common and will really become an important food resource. Feeding grain to stock will cease to be practical. Instead we will grow algae to provide stockfeed and food for humans, too. Algae, water plants, could become the major source of both food and liquid fuel. The dry residue left over after extracting the oil will be excellent for converting into both healthy, omega-3 rich human food, and fodder for cattle and fish. Algae could also provide the raw material for plastics and other things we now make from oil.

In Australia we have perfect conditions for such production. Our clear cloudless skies would provide maximum energy for growth of the plants, which could be grown using saline or brackish or other waste water, in large tanks or on salt pans, on arid land and in floating containers in the sea itself. As sewage and other wastes often contain heavy metals, algal food from these sources would have to be screened for such metals, but polluted algal oil would be fine for making plastics and fuel.

In addition to all this we will probably see factory-made meats. Researchers have already made sausages, using an adaptation of medical techniques that grow tissue for wound repair. Such sausages may look unappetising – but probably no more so than the current ingredients that go into making meat pies, which people eat in blissful ignorance.

In addition to all this there are 25,000 edible plants available around the world that we have never included in western diets. These should be explored to add variety and improve nutrition. Our current diet is intensely narrow, and often lacking in nutrition.

Humans are something like a third of the mass of all backboned animals that live on land. Most of the rest of the mass of life on land is now taken up by the creatures we keep, basically, to eat. So something less than ten per cent of this matter is now taken up by the wild creatures.

Dr Jan Zalasiewicz
University of Leicester
BBC "Discovery: The Age We Made", 11 Nov 2012

Many people die because of the food they eat. Indeed, just as advertising of cigarettes is now banned, we could do with a ban on the advertising of foods that cause heart disease and gross obesity.

In fact, although the idea of food produced in factories and in algal tanks may dismay many people, the future of food could be exciting, varied and nutritious. And, in the process of producing it we could reclaim nutrients and prevent much of the pollution of water sources and of the ocean that we currently cause. So it could be a win-win situation, not the horror story some people imagine.

Better still, such food production could feed the people in many countries where food shortages and famines are already common.

Thanks to Julian for an extremely interesting evening.

For further information see Julian Cribb's articles *What if the well runs dry?,* in *The Canberra Times,* 15 March 2013, and *Solutions to the Global Food Crisis*, in *Australasian Science*, April 2013.

Jenny Wanless

The explosion of humanity has decimated many animal and plant populations, extinguished species and sub-species, and caused collapsing ecologies and the shrinking and fragmentation of wild places. Ocean life has been reduced to food and by-catch; rainforests razed for meat and soybeans, boreal forests cut down for wood, mountains detonated for coals and natural gas and grasslands overgrazed and converted strictly into human breadbaskets while fresh waters are dammed, dumped into, overfished and channelized.

Life on the Brink: Environmentalists Confront Overpopulation, by Philip Cafaro and Eileen Crist

The global food crisis (2)

Reflections on NSF's March meeting

It is good to be hopeful, no matter how dire the prognosis. And after being thoroughly, and utterly, dire Julian got out the whip and spurred optimism to a Bernborough finish. I consider it to be over-optimistic: we continue to live on the edge, pushing limits ever harder. We increase efficiencies at the expense of redundancies - those unused reserves which are needed to overcome the forever-unseen emergency. Forever living on the brink is not a recipe for endurance of society, or of our species.

Julian, replying to a question on demography, surmised that, in the absence of disasters, human numbers would continue to ascend to perhaps an extra couple of billion. Subsequently, during the next one or two hundred years, there would probably be a decrease to a speculative four billion. He noted that people were living longer, but Total Fertility Rates (TFR) were declining, as in Japan and others; and that the reasons for varying TFR were a matter of speculation. Efforts to influence these rates, for increase or decrease, appeared to have had no impact. He had noted, during his talk, that disastrous population decline such as for the Mayans had been associated with food shortage.In relation to his comments on declining TFR, it might be worth noting variations and circumstances. For developed nations, consider three groups. The first, with a fairly constant TFR of between 1.7 and 1.8, are exemplified by Sweden, Norway, and Australia (though Australia has now risen closer to 1.9). All have well-educated society, good access to social welfare, comparatively low unemployment, and residential housing at mostly low-density. The second group, with TFR fairly constant at about 1.4, can be represented by Japan and Singapore. Both societies are well-educated, have good access to social welfare, low unemployment; and a population housed in high-density communities.

The third group for consideration, with fairly constant TFR at about 1.4, consists of Italy, Greece, and Spain. All three have well-educated society, good access to social welfare, very high unemployment, and housing of moderate density.

Regarding the two developing giants, India has a TFR of 2.5 and hopes to have TFR down to 2.1 by 2060. There remain many uneducated women among its 1.2 billion people. On the other hand, China's TFR has dropped to about 1.6 for its 1.3 billion population; though uncertainty exists as to how much this decline results from its draconian one-child policy.

Julian's comment about efforts to alter TFR having no impact is at odds with the demonstrated success of Bill Ryerson's educational programs in developing countries. These programs have the potential to help minimize the trauma of excess fertility in fifty developing countries having TFRs of between 3.5 and over 7.0; and an aggregated population of almost one billion. Such programs are part of wholistic necessity; and, if more promoted, would do much to relieve the impossible burden on agriculture there.

Julian, referring to depleted wild fisheries, put faith in farmed fish fed from human food waste. In giving a plug for aquaculture, he said that our far north was ideally placed for Barramundi farming. Unfortunately, Barramundi is unsuitable. This isn't because Fred Nile would disapprove due to its gender-bending proclivity. The reason comes from advice by experts at the 2004 Crawford Conference (Fish and Food Security): only Carp and Catfish, champions among piscatorial garbage collectors, are practical contenders. Other fish need a ratio of about ten tons of food (holy mackerel?) in, for one ton out of saleable fish.

He noted the alarmingly depleted world reserves of phosphorus, and the necessity of recycling nutrients. The same issue had been starkly referenced in 2003 by Duncan Brown (*Feed or Feedback*). However, delaying the looming crisis to some degree may be possible. I defer to advice from genuine experts: To what degree, and for how long, can uptake of phosphorus by symbiotic fungi assist agricultural plantings in Australia's phosphorus-deficient soils? Recovering nutrients from sewage he considered essential; though warned of the hazards of heavy metal and chemical contamination. He suggested there would be much advantage from agricultural production within the cities if recycling of nutrients and water could be conducted there. I surmise that, no matter how successful, it is limited. While we might not live by bread alone, there seems to be insufficient consideration of carbohydrates. To date, the bulk of these have been obtained from vast and fertile fields densely carpeted with grasses such as rice and wheat. Regardless of its possible advantages, a city's vertical farm and its images invoked in me a confusion of thought: where we are heading? The Babylonian ziggurat came to mind.

> *At this point, it's almost certainly too late to manage a transition to sustainability on a global or national scale, even if the political will to attempt it existed, which it clearly does not. Our civilization is in the early stages of the same curve of decline and fall as so many others have followed before it. What likely lies in wait for us is a long, uneven decline into a new Dark Age from which, centuries from now, the civilizations of the future will gradually emerge.*
>
> *Life on the Brink: Environmentalists Confront Overpopulation, by Philip Cafaro and Eileen Crist*

Algae farming came galloping in as a late starter: Australia could spur it along to produce enough oil for all our transport fuel, be a source for plastics, and provide foodstuff from the residue. Nurtured in paddocks up north on some additives to a bulk diet of carbon-dioxide, salt-water and sunshine, he rated it at odds-on favourite. He could be right, and maybe it will overcome several stumbling blocks.

However, the dark horse at the barrier is saddled with Climate Change colours: it could be at even more frightening odds than those mooted by Julian. Without all punters having an adequate grasp of Humanity's place in nature, and subsequently leaning heavily on the course stewards, not even the bookies will have a win in the Human Futures Stakes.

An interesting and provocative talk.

Colin Samundsett

New Biosensitive Futures pamphlets

Two new pamphlets from the Biosensitive Futures Program have recently been put on the website: *A story* and *A glimmer of hope*.

A story

There is a story of overarching significance for every one of us and for society as a whole. Yet it is understood by only a small section of the community. It is the story of life on Earth and of how humans fit in to this story. It is a true story....

More here:

http://www.biosensitivefutures.org.au/biosensitivefutures/part-2-essence-pamphlets/a-story/view

A glimmer of hope

The best hope for the future lies in a rapid transition to a society that is in tune with, sensitive to, and respectful of the processes of life – a society that is attuned to our own biology and to the living world around us. We call this a *biosensitive society.* When we are in an optimistic frame of mind, we see a glimmer of hope. The fact is that humans have amazing ingenuity when motivated. Computer technology, thermonuclear weapons, space travel, and the elimination of smallpox are among countless recent examples. It is surely well within the capacity of humankind to bring the ecologically destructive processes under control....

More here:

http://www.biosensitivefutures.org.au/biosensitivefutures/part-2-essence-pamphlets/a-glimmer-of-hope/view

Deconstructing wind farms

A response to "Wind farms – to be or not to be"
***Nature and Society* Feb - March 2013, pp. 6 – 7**

When I joined the public service in Canberra in 1973 as a Graduate Clerk, I was fortunate to work first with the National Estate Committee of Inquiry, a pioneering environmental inquiry of the Whitlam government that set the scene for later significant environmental policy. Not a boring public service department, but straight into the deep end with the likes of Judith Wright, Len Webb, Milo Dunphy, and David Yencken.

By the late 1980s there was a surge of public and political interest in the urgency and environmental significance of climate change. Other than reference to four, five, or six degrees, a Greenhouse Alert! broadsheet produced for Australian schools for World Environment Day 1989 could have been written yesterday. Environment Ministers set up branches, then divisions, and then whole departments to deal with the issue.

> *There's a cartoon by Joel Pett that sums it up. Someone in the crowd says, "What if it's a big hoax and we create a better world all for nothing?"*
>
> *Reader comment on New York Times website, 9 March 2013*

Move forward another two decades and where are we? The 'growth forever' model is still well entrenched. Governments have facilitated the expansion of the emissions-heavy aviation industry. Mega coal mines have been opened to export yet more Australian coal. Emissions keep rising. Yet now we have planning and environment departments, even Prime Ministers, pushing a new saviour, most often seen in the classic environmental icon of the industrial wind turbine. Convinced? I'm not. On so many fronts, including adverse health effects, divided communities in conflict, questionable reduction in greenhouse gas emissions, and disrupted landscapes, industrial wind scores badly.

Alby Schultz MP gave a speech on wind power in the House of Representatives on 13 February 2013 . His electorate of Hume adjacent to the ACT takes in towns such as Goulburn, Yass, and Boorowa, where considerable wind farm activity is underway or planned. He summarises the situation well when he said that "communities are at war with each other, adjacent landholders face serious land value losses and health issues continue to emerge."

With respect to the widely discussed health issue, Simon Chapman at the University of Sydney continues to promote his psychogenic theory, suggesting that any problems linked to adverse health effects from wind farms are psychologically created. Much was also made of this so-called 'nocebo' effect at a Senate hearing in 2012 to discuss a bill to control excessive noise from wind farms. The nocebo effect has been used by wind energy proponents such as Chapman and various wind energy associations as a way of invalidating claims about adverse health effects.

What is dangerous about Chapman's use of psychogenic theory is that all manner of technology (e.g. industrial wind turbines, mobile phone towers, Wi-Fi) can be declared benign, when more detailed knowledge of the areas in question suggests the opposite.

For example, Chapman casts current concerns about electromagnetic fields as being merely a form of 'technophobic' anxiety about modern technology (Chapman, 2012). Although his background training is as a sociologist, he nevertheless gives mobile phones and mobile phone towers a clean bill of health. On the other hand, neurosurgeon Vini Khurana et al. (2010) reviewed epidemiological evidence of health risks, citing studies reporting increased prevalence of adverse neurobehavioural symptoms or cancer in populations living less than 500 metres from mobile base stations.

The shallowness and inaccuracy of Chapman's assertions are highlighted by a major report—BioInitiative 2012 (www.bioinitiative.org)—which provides a rationale for biologically-based exposure standards for low-intensity electromagnetic radiation. With expertise in the biophysical and medical sciences, the contributing authors discuss the implications of 1,800 new studies since the 2007 BioInitiative report.

There is now reinforced scientific evidence of risk from chronic exposure to low-intensity electro-magnetic fields and to wireless technologies. The report argues that the status quo is no longer acceptable in light of the evidence for harm, particularly given the large number of people exposed worldwide.

Chapman's use of a one size fits all sociogenic theory is thus overworked, shallow, and simplistic. With respect to wind turbines, he ignores and is not interested in the direct biological effects of low frequency noise for example. Using the 'nocebo'

concept as an explanation for the chronic sleep disorders from nighttime arousals related to noise is simply irresponsible.

There continues to be corporate and institutional denial of adverse health effects, in spite of the fact that there is strong evidence that wind turbines cause serious health problems in nearby residents at a nontrivial rate. The bulk of the evidence takes the form of thousands of adverse event reports. These reports provide compelling evidence of the seriousness of the problems. Nonetheless, proponents of turbines have sought to deny these problems by making contradictory claims such as the evidence does not 'count', the outcomes are not 'real' diseases and/or are the victims' own fault, and that acoustical models cannot explain why there are health problems, and so the problems must not exist (Phillips, 2011).

There is some systematic peer reviewed research, such as a study in Maine USA, which demonstrated disturbed sleep, daytime sleepiness, and impaired mental health in residents living within 1.4 km of two wind turbine installations (Nissenbaum, Aramini, & Hanning, 2012). A study in New Zealand likewise found lower overall physical and environmental quality of life measures, including significantly lower sleep quality, in residents living within 2 km of a turbine installation (Shepherd, McBride, Welch, Dirks, & Hill, 2011). There is clearly a need for further systematic research as recommended by an Australian Senate inquiry on wind farms in 2011 (Senate Community Affairs References Committee, 2011). However, institutional inertia has been evident in implementing such recommendations to date, and in Canada, strong reservations have been expressed about the independence of proposed research by Health Canada ("Prominent physician and surgeon Dr. Robert McMurtry calls for wind turbine moratorium," 2012).

Significantly, a legal hearing in 2011 in Ontario, Canada, heard evidence from teams of experts arguing for and against claims of adverse health effects from wind turbines. The Environmental Review Tribunal (2011) concluded: ''This case has successfully shown that the debate should not be simplified to one about whether wind turbines can cause harm to humans. The evidence presented to the tribunal demonstrates that they can, if facilities are placed too close to residents.''

The current standards for assessing noise from wind farms in Australia are inadequate, particularly as they do not address the low frequency sound and infrasound strongly implicated in adverse health effects. Turbine noise has a character that makes it far more annoying and stressful than other sources of noise at the same sound level. This is in part because of an up and down amplitude modulation from the blade passage past the tower. In addition, a 'pulsing' infrasound and low frequency pattern is transmitted for long distances, and can readily penetrate walls and resonate inside rooms.

> *Because all species are products of gene/environment interaction, species that become extinct can never reappear because the exact environmental conditions out of which they arose long ago can never re-occur. Thus, population, human or otherwise, must be preserved in their habitat, with large enough numbers of individuals, to allow the perpetuation of demonstrably adaptive genomes (as well as different untested ones for the uncertain future). Thus, the protection of native peoples, tribes, cultures and societies in their natural habitat – in other words, the preservation of maximum biological and cultural diversity – is both ethically and ecologically necessary.*
>
> *Lorna Salzman, Politics as if Evolution Mattered, 2012, p 38*

There is further a critique of the economics of wind power, with large subsidies being required to support wind. In Alby Schultz's electorate of Hume alone, the subsidy for new wind turbines, excluding existing turbines, is set to reach $500 million to $1,000 million per year, or up to $10 billion over 10 years. Wind turbines are uneconomic unless they receive these very large subsidies. Moreover, wind requires backup when the wind is not blowing. Coal continues to be burnt while it is in standby mode (at least at 90% capacity), and coal consumption at power stations, according to industry figures, has not decreased.

Some argue that the costs of wind generation are coming down, but this is occurring by increasing the size of the turbines, creating more community angst, as the larger turbines are a significant imposition on the landscape and have a greater low frequency noise component. The costs of other renewables, particularly solar, are expected to come down much faster. Dieter Helm (Professor of Energy Policy at Oxford University) considers that there has been much 'hype' about wind power and its ability to curb carbon emissions (Helm, 2012). It is no good trying to pick winners for the task of reducing carbon emissions successfully. Rather, market reforms that emphasise price are

required, in order to get carbon emissions down in the cheapest way first, not the most expensive.

The mainstream 'green' position on wind turbines generally assumes that wind power reduces human production of greenhouse gases, and that some people may suffer some discomfort. It argues that wind power, while not perfect is of net benefit, and there is no way of reducing greenhouse gas emissions without human cost. I consider that this summation to be flawed and illogical.

Both the Greens and Doctors for the Environment Australia invoke the precautionary principle in relation to coal seam gas, but ignore it in relation to wind turbines. Ironic indeed when companies like AGL are involved in both wind farms and coal seam gas, the latter mining activity producing low frequency noise emissions too. If the precautionary principle were used, setbacks from houses of at least 10 km would be justified, given the lack of a systematic research base to support the safety of wind turbines. The health problems are often severe, forcing people out of their homes. Who can say what effect it is having on other species. The pernicious nature of the sound is considerably worse than other noise sources at the same decibel level.

Arguing in favour of a flawed approach by comparison with coal is a little like saying that execution by lethal injection is better than by hanging. Ideology has primarily driven the green argument, whereas there is scant access to and awareness of knowledge on the noise and health fronts for example. This underlines the critical importance of a holistic health/social cohesion/technology/economic/climate change assessment, not in silos by people coming at it from different perspectives. When a holistic assessment is undertaken, solar PV and solar thermal are way ahead when compared with industrial wind in my view - to say nothing of energy conservation measures.

Murray May

The confirmation bias (the mind's tendency to pick and choose information to support our preconceptions while ignoring a wealth of evidence to the contrary), is just one of a truckload of flaws in our thinking that psychologists have steadily documented over the past few decades. Indeed, everything from your choice of cell phone to your political agenda is probably clouded by several kinds of fuzzy logic that sway the way you weigh up evidence and come to a decision.

Why did we evolve such an apparently flawed instrument? Our irrational nature is very difficult to explain if you maintain that human intelligence evolved to solve complex problems, where clear, logical thought should offer the advantage….

[Hugo Mercier and Dan Sperber] believe that human reasoning evolved to help us to argue. An ability to argue convincingly would have been in our ancestors' interest as they evolved more advanced forms of communication, the researchers propose. Since the most persuasive lines of reasoning are not always the most logical, our brains' apparent foibles may result from this need to justify our actions and convince others to see our point of view – whether it is right or wrong.

Dan Jones, The Argumentative Ape, New Scientist, *26 May 2012*

References

Chapman, S. (2012). The sickening truth about wind farm syndrome *New Scientist*. Retrieved from http://www.newscientist.com/article/mg21628850.200-the-sickening-truth-about-wind-farm-syndrome.html

Environmental Review Tribunal. (2011, 18 July). Erickson v. Director, Ministry of the Environment. Retrieved 13 March, 2012, from http://www.ert.gov.on.ca/files/201107/00000300-AKT5757C7CO026-BGI54ED19RO026.pdf

Helm, D. (2012, 6 February). Dieter Helm: Forget the Huhne hype about wind power. *The Times*. Retrieved from http://www.dieterhelm.co.uk/media

House of Representatives proof Federation Chamber Bills Second Reading Speech 13 February. (2013). Speech: Alby Schultz MP (pp. 147 - 149).

Khurana, V. G., Hardell, L., Everaert, J., Bortkiewicz, A., Carlberg, M., & Ahonen, M. (2010). Epidemiological evidence for a health risk from mobile phone base stations. *International Journal of Occupational and Environmental Health, 16*(3), 263 - 267.

Nissenbaum, M. A., Aramini, J. J., & Hanning, C. D. (2012). Effects of industrial wind turbine noise on sleep and health. *Noise & Health, 14*(September-October), 237-243.

Phillips, C. V. (2011). Properly interpreting the epidemiologic evidence about the health effects of industrial wind turbines on nearby residents. *Bulletin of Science, Technology & Society, 31*(4), 303 - 315.

Prominent physician and surgeon Dr. Robert McMurtry calls for wind turbine moratorium. (2012, 19 July). Retrieved 14 March, 2013, from http://www.canadafreepress.com/index.php/article/48174

Senate Community Affairs References Committee. (2011). *The social and economic impact of rural wind farms*. Canberra: Commonwealth of Australia.

Shepherd, D., McBride, D., Welch, D., Dirks, K. N., & Hill, E. M. (2011). Evaluating the impact of wind turbine noise on health-related quality of life. *Noise & Health, 13*(September-October), 333-339.

Book review

The Great Disruption: how the climate crisis will transform the global economy

Paul Gilding, Bloomsbury, 2011

Paul Gilding has led a remarkable life, from the military to Greenpeace to consultant and entrepreneur, he seems to have been packing everything in. Along the way he met and worked with many corporate bosses and realised they were decent people. He also learnt not to 'demonise the enemy'.

This book is a racy, interesting read about the situation in which our civilisation now finds itself. I had some reservations about it, for the little I had seen or heard of him suggested an almost unbounded optimism, and that does not chime well with my understanding of humanity's current situation.

However the book is certainly worthwhile reading. In the first half of the book Gilding has provided a quick but compelling analysis of the dire situation in which we now find ourselves and how we got here. The second half concentrates on possible solutions. As he enumerates the many ways in which people in many places are beginning to forge new, more sustainable lifestyles and better communities Gilding's optimism shines through. He believes that people are slow but not stupid. When we have come up against planetary boundary after planetary boundary for long enough, he thinks we will act, and act quickly and decisively – a situation he compares with the mobilisation of the allies in World War II.

But it is chapter 8, between the two halves of the book, that holds the key to why Gilding wrote the book, and to what it is really about.

Gilding is certain that we are in deep trouble, and that we can only survive and move through this perilous time, if we stay focused and determined to act together. And we can only do that if we adopt a positive attitude, make hope triumph over despair.

Gilding thinks that many people do understand the seriousness of the situation we are in, but deny it because there is no foreseeable solution. In fact despair is the only possible rational reaction when you understand what is going on. We must accept that everything is going to get very ugly, physically, economically and psychologically. We are facing a long crisis and change will be discontinuous, chaotic and transformational. But it has to start.

There is no point now in saying we must save the environment, or particular species, or the Earth. What we have to do now is save our own species and our civilisation, or we will be reduced to a population of a few hundred million, eking out a difficult life on a degraded and hostile planet. Our actions now will affect the Earth's planetary systems for thousands, maybe millions of years.

We need crises to get us started – then we will realise we must not settle on doing our best but on doing whatever is necessary to rectify the situation. We would stop saying we cannot afford to do x y or z, we would simply go ahead and do them. We would cease to have a growth economy, and then realise that growth had never really worked anyway. So in the end we would be better off.

> *Human actions have been undoing much of what the biosphere offers to make this planet suitable to support a quality of human life. A growing number of humans, equipped with resource-ravenous technology, have exploited a widening array of natural resources, both renewable and non-renewable. Ideas about limits are now vital.*
>
> *William Catton, Overshoot*

Gilding has called the crises that will precipitate the turning point the Great Disruption because he believes it is far more likely to be a disruption in humanity's evolutionary process than the collapse of civilisation. That is one way to look at it.

Actually we do not know what people thought as the Roman Empire fell to pieces, or what the people of the Tigris and Euphrates called it as they watched their irrigated farmlands turn to desert. These things were disasters for them, but probably most of them just got on with living as best they could, while their elders lamented the good times which they had heard of from their elders. Collapse or disruption – people cope. Historians give the events names.

We can hope with Gilding, but we can despair at the lack of action. If indeed there are historians in the future to give the event a name, then presumably our species belated reaction will have been a success.

Jenny Wanless

One man's aim

Candour before tact, honesty before diplomacy.

Tim Murray, Canadian population activist, 2006

Good news on population

In February two reports in *The Australian* contained good news for those of us who realise that human overpopulation is a serious problem that exacerbates every other environmental problem we are facing.

One report from Ross Fitzgerald in *The Australian*, 16 February, was headed *A changing world looks for a fresh approach to age-old challenge.* This dealt with the problem of an ageing population, and how much this will dampen economic growth, with the high cost of aged care and a considerable restructuring of society.

The ageing is caused by declining birth rates coupled with longevity. For instance, in 1901, four per cent of Australians were aged 65 or older. This percentage has increased to fourteen now. Within ten years old people will outnumber children. Fertility in Australia has dropped from a peak of 3.5 children per woman to 1.9 children. In Japan the comparable figure is 4.5 in the post-war years to 1.3 and in China from 6.1 to 1.5 per woman.

> *The raging monster upon the land is population growth. In its presence, sustainability is but a fragile theoretical construct. To say, as many do, that the difficulties of nations are not due to people, but to poor ideology and land-use management is sophistic.*
>
> *Harvard scholar and biologist*
> *E O Wilson*

David Ignatius, in the paper's edition of 12 February, had an article headed *Muslim world faces fertility crisis*. He noted that Nicholas Eberstadt, using data for forty nine countries and territories with Muslim majorities, had found that fertility rates had declined by forty-one per cent in the period between 1975-80 and 2005-10. Over this period, the fertility rate in Iran had declined seventy per cent and the population is projected to start declining within twenty years. Twenty-two Muslim countries or regions recorded declines in the fertility rate of over fifty per cent in the period.

These declines have accompanied a marked shift in the marriage rate and in the age at marriage. This 'flight from marriage' is well known in Europe, but is also occurring in Asia. In Japan the percentage of women aged 30-34 who have never married rose from 7.2 to 26.6, and in Burma from 9.3 to 25.9 over the period 1970 to 2000.

What is particularly surprising is that a similar change is taking place in the Arab world, which is now tracking on the same path as that of Europe in the 1980s. So although Muslim countries are currently experiencing a very large youthful bulge in their populations they will fairly soon start to experience the same problem of ageing populations.

Although both of these articles referred to the problem of an ageing population, this is actually very good news. Historically populations were younger, because there was a heavy death toll at all stages of life; relatively few children lived to become old. Epidemics could wipe out whole towns, decimate an entire country. Our ageing population is a result of much lower death rates amongst children and young adults – would those who decry the present state really want to restore high infant mortality? We hear of women who bore ten children and outlived them all. That is the way to have a youthful population. Is that what they would desire?

Indeed the world is in urgent need of a smaller human population. Both Julian Cribb and Paul Ehrlich, speaking in Canberra in March, when asked about population said give women the power to decide. Give women full equality with men, equal pay for equal work and access to contraception: they will voluntarily reduce overpopulation.

Jenny Wanless

Human population increases

By 2050, human population is projected to reach as high as 10.5 billion. Uganda is projected to grow from 33.8 million to 91.3 million. Niger from 16 million to 58 million, and Afghanistan from 29 million to 73 million. India adds 11 million net gain annually to its 1.2 billion in 2013 while China adds another 8 million net gain annually. Both countries expect to explode to 1.6 billion. At 82 million, Egypt, a country that cannot feed itself in 2013 and relies on grain imports, refuses to use birth control due to Islam's death grip on the people, and expects to hit 150 million by mid-century. In 1900, Ethiopia had 5 million, in 1950 it had 18.4 million, in 2010 it had 85 million and is projected to reach 173 million by 2050. Their rapid population growth figures in the decimation of nearly all of Ethiopia's once-vast forests and consequently climate change.

Martha Campbell, *Life on the Brink: Environmentalists Confront Overpopulation*, 2012

This quotation and the one on page 3 put different positions on fertility in Muslim nations to the article on this page. Time will tell.

Farrago

The value of nature

In our one-eyed focus on value added we economists have neglected "that to which value is added", namely the flow of resources and services from nature. "Value added" by labour and capital has to be added to something, and the quality and quantity of that something is important. Now, there is a real and important sense in which the original contribution of nature is indeed a "pie", a pre-existing, undivided totality that we all share as an inheritance. It is not an aggregation of little tarts that we each baked ourselves. Rather it is the seed, soil, air, sunlight, and rain (not to mention the gene pools and suitable climate) from which the wheat and apples grew that we converted into tarts by our labour and capital. The claim for equal access to nature's gifts is not the invidious coveting of what our neighbour accumulated by her own labour and abstinence. The focus of our demands for income to redistribute to the poor, therefore, should be on the value of the contribution of nature, the original value of that to which further value is added by labour and capital. People generally resent seeing the value they added by their own labour and enterprise taxed away, although they accept it to some degree as necessary. But they do not resent seeing the value freely added by nature taxed away. Rather they resent seeing it accrue as unearned income (scarcity rents) to owners who added no value to what nature provided.

Herman Daly, *Sustainable Economic Development*, April 2002

Polite conservationists and active conservationists

Polite conservationists leave no mark save the scars upon the Earth that could have been prevented had they stood their ground.

David Brower, US conservationist, founder of Earth Island Institute

The central dilemma of modern humanity is the failure to adapt our behaviour, institutions and objectives to certain realities which we ignore or defy through our faith in technology and religion. This defiance is at the root of our ecological crisis along with the delusion that the human species can be perfected.

Lorna Salzman, Politics as if Evolution Mattered, 2012, p 2

Coffee

The demise of coffee is, of course, a minor inconvenience compared with some of the projected effects of dangerous climate change. It is not a staple crop; nobody will starve for lack of it, though 26 million farmers who depend on it for their livelihoods face a precarious future.

But coffee still has the potential to send a powerful message to the world about the reality of what we are doing to our climate. If you wanted to find a commodity whose escalating scarcity and price would cause maximum discomfort to complacent westerners, coffee is about as good as it gets.

Coffee is the world's most popular beverage, with about 500 billion cups drunk every year, fuelling an export industry worth $15 billion. It is also the number one source of caffeine, the world's favourite recreational drug. Billions of people all over the world – and especially in Europe and North America – are hooked on it and would find the prospect of its soaring cost or eventual disappearance very irritating.

Editorial in *New Scientist*, 5 January 2013

Oil from algae

A research team at the Australian National University has found that with just one mutation in a single gene, the green algae *Chlamydomonas*, a pond scum, can produce about ten times as much oil as its unmodified relative. The oil is an excellent source of energy-dense fuel. Better still, the algae can be fed directly with carbon emissions from factories and other industry.

The team is investigating closed systems called photobioreactors which will capture the carbon dioxide from heavy industry and feed the algae at the same time, to optimise algal growth and oil production. The next step is to tweak the algae to make them secrete the oil into the water in which they are living. If this is successful, then the oil and water can be easily separated, rather than having to go through an energy-intense process of refining.

The oil would be suitable for aircraft and other modes of transport.

ANU Reporter, Winter 2012

Stygofauna

Speleologists have often reported on the strange colourless fish found in underground rivers. These fish are part of the obvious subterranean life known as stygofauna inhabiting underground water, named for the River Styx which the souls of the dead had to cross to enter Hades in Greek mythology. Most stygofauna are much less obvious than the fish. Many live in cracks, and even in gravel and sediments, wriggling between the grains in aquifers. But they are characteristically colourless, blind and soft bodied.

Over the last two decades research has identified many species, and is finding out the importance of these tiny creatures in the larger scheme of things. The fauna consists largely of crustaceans, but there are also worms, gastropods, fish, beetles and mites. They grow slowly, live long lives, have few young and travel very little, all adaptations to a low energy environment.

About 4000 different species have now been identified in Australia. Some of these species date back to Gondwana, some are even older dating back to Pangaea, and the Tethys Ocean, 200 million years ago.

Some species are stray visitors from the world above, but many are totally confined to their subterranean world. These are known as stygobites. They are often unique to a single aquifer, and the fauna in one aquifer could be quite different from those in a nearby aquifer.

Professor Andrew Boulton, of the University of New England, NSW, has been studying the hyporheic zone below streams. This wet stream bed often hosts a rich biological assemblage. Here there is a mix of species visiting from above and stygofauna. Between them they break down the organic matter such as leaves that have fallen into the water, releasing carbon and other nutrients that in turn feed biofilms of microbes. The biofilms, in turn, filter the ground water.

As is found in any detailed study of an environment all these interactions are essential for the health of the whole system. They increase nutrient flow and purify water, so they have a strong influence on the river system and also on the quality of groundwater. As we know more we find out yet again how indebted humans are to such tiny and apparently insignificant creatures.

We also know that the systems can all be adversely affected by toxic hydrocarbons, pesticides, industrial runoff and excessive extraction of water. This is very important as ninety seven per cent of the available fresh water on Earth is groundwater, and over extraction is common, with many aquifers seriously depleted.

Australasian Science, November 2012

> *The argument to this point has been that these are among the huge and easily overlooked implications of de-growth, because growth is not an isolated element that can be dealt with without remaking the rest of society. It is not that this society* has *a growth economy, it is that* this is a growth society.
>
> *Ted Trainer,* De-growth: do you realise what it means? *in Futures 44, 2012.*

Tasmanian Forestry

Problems with Tasmanian Forestry have led many people to overestimate the financial importance of that industry to the state. Tasmanians, when questioned on the subject, thought that forestry accounted for about 30% of the state's economic activity and 20% of its workforce. The actual figures are respectively about 3% and 0.5%, for the whole logging industry, including plantations. As the latter make up about half of the industry, the figures for native forest logging would be about half of that.

According to Richard Denniss, of the Australia Institute, and Andrew Macintosh of the ANU's Centre for Environmental Law, trying to keep Forestry Tasmania going cost $100 million in Commonwealth subsidies over the past six years. Despite that the industry still lost $100 million per year and had an unfunded superannuation liability of another $100 million.

Australasian Science, October 2012

Forming the human species

It's not the nature of human beings to be cattle in glorified feedlots. Every person deserves the option to travel easily in and out of the complex and primal world that gave us birth. We need freedom to roam across land owned by no one but protected by all, whose unchanging horizon is the same that bounded the world of our millennial ancestors. Only in what remains of Eden, teeming with life-forms independent of us, is it possible to experience the kind of wonder that shaped the human psyche at its birth.

E O Wilson in *Life on the Brink: Environmentalists Confront Overpopulation*

Nature and Society Forum

Contributions for the next edition of *Nature and Society* are invited now from all members. They should be sent to the editor, Jenny Wanless, 22B Jensen St, Hughes ACT 2605, ph 02 6281 3892, or to our office by 21 May 2013.

Contributions may be sent on paper or electronically. Electronic submission is preferred.

Items in *Nature and Society* do not necessarily reflect the opinions of the majority of the Forum members, but are published in the hope of stimulating thought and discussion about biosensitivity.

Jenny Wanless and Keith Thomas prepared this edition together with the named contributors; Jenny and Keith also provided the unattributed items and the quotations.

Please circulate *Nature and Society*

Use this copy of *Nature and Society* to help spread the word about healthy people on a healthy planet and our quest to increase biounderstanding. When you have finished with your copy:

- Foreward a copy to a friend
- Circulate it at work
- Copy it to a relative, acquaintance, neighbour or members of a group you belong to

We are specially keen to get more concerned interested young people acquainted with *Nature and Society*, so please use your imagination to help us achieve this. We can send you additional copies of *Nature and Society* free of charge for this purpose.

If you know of someone who'd appreciate a free set of recent editions of *Nature and Society*, please let us know and we'll do the rest.

Nature and Society Forum membership form/tax invoice (includes GST) ANB 52 456 986 523

I/We would like to:

- ☐ become a member, and enclose payment for $ .....
- ☐ renew my membership
- ☐ make a tax-deductible donation of $ ..... to the Nature and Society Forum
- ☐ Find out more about .....

Payment: ☐ Cheque

☐ Electronic funds transfer to NSF account 1047492 at BSB 801-009

Annual membership $55 per person
Concession $22 per person
(students, welfare pensioners)
Life membership $550 per person
Corporate membership $110

Name: .....

Address: .....

.....

..... Postcode: .....

E-mail: .....

Telephone: .....

Date: .....

Please send completed form and payment to Nature and Society Forum
GPO Box 11, Canberra, ACT 2601