Nature&Society

The Journal of the Nature and Society Forum **February-March 2014**

Editorial

The business of celebrating the New Year seems to get bigger every year – more and better fireworks loudly spruiked to encourage ever more people to gather together. The Christmas – New Year week represents a great orgy of spending and eating, both of which, carried to excess can be bad for us. The New Year fireworks, spectacular and exciting as they are, also have a down side representing a lot of money going up in smoke and costing the environment much waste and pollution, including greenhouse gas emissions.

> *Everything that needs to be said has already been said. But since no one was listening, everything must be said again.*
>
> *André Gide, d 1951*

But what does New Year signify? Presumably from very early times humans were conscious of the seasons, and for early Homo sapiens those seasons and the varying length of day would have been supremely important. The earliest people became very familiar with the movements of the sun; stone-age cultures seem to have had a very real feeling for the shortest and longest days of the year, the solstices, building structures such as Stonehenge that were aligned to the sun's position at those times.

These early and real physical experiences later got overlaid with various other stories, including that of the coming of the Messiah, and somehow these resulted in the two separate celebrations of Christmas and New Year. But none of this explains the current excessive expectations of New Year. Given that experience has taught us that all our problems, whether personal, political or anything else, just continue on without a break, why celebrate New Year in such spectacular fashion?

There is no way in which New Year represents a new start, a clean slate or anything else. If our behaviour continues on the way it has in the past, then all the current problems just continue too. Unfortunately that is if anything truer now than it was not so long ago. Australian politicians have noted that voters are apparently becoming more selfish and less concerned with the plight of refugees, the state of the environment, and the dangers of climate change, and are following that retrograde lead.

If we wish for a better future, a new start, then we need a more comprehensive vision for the future. We need to recognise our kinship with other people and with the rest of the natural world, and not just our kinship but our utter dependence on the natural world for our survival.

Our world is one comprehensive web of life. A number of studies have shown that the world as we know it is a world made by life itself. The young Earth was forever changed by the evolution of the first microbes, which in turn paved the way for the evolution of all the plants and animals that make the Earth habitable for us.

Microbes made and continue to make the soil and help to keep it fertile, they help to make the rain which enables our crops to grow. The right mix of microbes in our bodies can keep us healthy, a different mix can make us sick.

When we ignore our complete dependence on the health of the natural world, we ignore our very life support system. This is why the Nature and Society Forum has consistently tried to raise understanding of the fact that to have healthy people, we must have healthy

Contents

ecosystems, a healthy planet. The Frank Fenner Foundation will continue with that task.

We also need to create a new understanding of what we as individuals and as a species actually need to enable us to have a satisfactory life. It is not a continuing increase in possessions, or a continuing race for affluence. And it is certainly not one of continuing war, or sectarian battles, or violence of any kind.

It is a life well lived, using our varying skills and abilities in meaningful activities both in work and play, with good friends for company. From a physical point of view it is being active, but with sufficient rest, with some beneficial stress, but not too much, sufficient healthy food, but not too much. Excessive consumption is antithetical to a good life.

Society as a whole will also benefit from avoiding excess. Rather than seeing continuous growth as necessary and a sign of success, our species must see that balance is what is needed. We must work towards a steady state, with no growth in population or consumption; indeed a slow decline to sustainable levels is needed. Then humankind will indeed be able to welcome in a new year, and a future of modest prosperity and peace.

Jenny Wanless

If the forest were a financial system, trees would be its old money. Deeply rooted, they grow slowly, investing heavily over time in woody trunks and branches to support their leaves and providing homes for a zoo of other species. Vines, on the other hand, would be the flashy junk-bond traders. Representing up to half of the plant species in a typical rainforest and producing up to 40 per cent of all leaves, they are down-and-dirty competitors. They invest almost nothing in supportive tissue, instead taking advantage of the trees' investments to scramble up to the top of the forest and produce great flushes of leaves that bask brazenly in the full sun.

William Laurance, New Scientist
5 October 2013

Blood in the mobile

Danish film-maker Frank Poulsen's recent movie *Blood in the Mobile* makes a connection between the illegal mining of minerals in the Congo and the bloody civil war there, where miners, many of them children, are forced to work for weeks underground and are often killed when the mines collapse. Meanwhile, mining companies are busy resurrecting the idea of collecting minerals from geysers on the sea floor, and possibly destroying whole ecological habitats in the process. All this to get a supply reliable enough to satisfy the huge demand for flat screen TVs.

Craig Gamble, The Canberra Times
29 October 2011

Rjukan's winter sunlight

The Norwegian town of Rjukan was founded in the early twentieth century by engineer and industrialist Sam Eyde, in order to harness the 100 metre Rjukanfossen waterfall to produce and use hydroelectricity. The power was used in factories using Eyde's new technologies to produce saltpetre by oxidising nitrogen from the air, and to make industrial quantities of hydrogen by water electrolysis.

The town itself is in a deep valley running east west, and from 28 September to 12 March the low winter sun does not reach the town at all. Eyde himself considered the idea of mountain top mirrors to reflect sunlight into the town, but no suitable technology was available at the time. Instead Eyde's company, Norsk Hydro, installed a cable car to carry townsfolk nearly 500 metres up to the sunlight. The Krossobanen, installed in 1928, is still running, taking passengers up to spectacular views – and a good coffee.

But now a local resident, an artist, has produced the Solspeileet, consisting of three 17 square metre concentrating solar power mirrors, helicoptered into place. These heliostats generate their own power to tilt and rotate, projecting a focussed beam down into the town square, with their movement controlled by a computer in a Bavarian town.

Although many people had approved of the installation there had also been opposition. Now all are in favour. Townsfolk like to take a break from normal routine and go to sit in the square for a short time. The sunlight is greeted with smiles by the residents, and an increasing number of visitors are drawn to the town to see the installation for themselves. Additionally, at least one hi-tech company has made enquiries about moving to the town, attracted by its growing reputation.

The Guardian Weekly, 6 Dec 2013

He who dares not offend cannot be honest.

Thomas Paine

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.

Coming NSF meetings

Wednesday 16 February. Andrew Glikson: Milestones in the evolution of the atmosphere: the Anthropocene in perspective. 7:30-9:00 pm at the ANU's Frank Fenner Building, corner of Daley Road and Linnaeus Way.

The evolution of the atmosphere, oceans and biosphere can be traced from about 3.55 billion years-ago, through natural cataclysms, all the way to the Anthropocene—a geological era triggered by a mammal species which uniquely learnt to master ignition and split the atom.

The histories of the atmosphere and of life are intertwined, from an initial Venus-like atmosphere dominated by greenhouse gases and sulphur gases, the oxidation of methane, sequestration of CO_2 and build-up of nitrogen led to intermittent ice ages from at least as early as 3 billion years ago. This was accompanied by rises in oxygen in several stages, at 2,400, 850 and 635–542 million years ago, allowing oxygen-binding proteins and emergence of the multicellular fauna. The atmospheric build-up of volcanic and metamorphism-released CO_2 and repeated plate tectonic-driven cycles of mountain building, erosion and sequestration of CO_2 by oceans and marine carbonates ensued in intermittent glacial periods, lowering atmospheric CO_2 levels from several thousand ppm to less than 500 ppm, including the post-32 million year ago glacial era triggered by the formation of the Antarctic ice sheet.

The advent of land plants from 420 million years ago led to carbon-rich land surfaces interfaced with an oxygen-rich atmosphere, a flammable combination, culminating with the emergence of Homo - a fire-triggering species magnifying entropy in nature by orders of magnitude. Since the onset of the industrial age the rise rate of atmospheric greenhouse gases reached an order of magnitude similar to rates associated with mass extinctions of species, constituting a geological event horizon in the history of planet Earth.

Biographic note: Andrew Glikson has studied the evolution of the early Earth crust in Australia, South Africa, India and Canada, investigated the effects of large asteroid impacts on the atmosphere, oceans and on mass extinction of species, and reviewed the relations between climate and human evolution.

He presently has a number of affiliations at the ANU.

Wednesday 19 March. Michael Croft: Eating as an Ecological Act. 7:30-9:00 pm at the ANU's Frank Fenner Building, corner of Daley Road and Linnaeus Way.

Michael is a farmer, who understands that what we eat has wider implications well beyond our own personal lives. He says that our local, national and international food systems are deeply dysfunctional and are desperately in need of reform: the future of our planet depends on it.

Michael is very active as the President of the Australian Food Sovereignty Alliance, and as a civil societies' Australasian delegate to the UN/FAO on World Food Security. He is on the advisory board of Food Tank and a member of the International Planning Committee for Food Sovereignty.

NSF news

Frank Fenner Foundation
For healthy people on a healthy planet

The current patterns of human activity on Earth are ecologically unsustainable. If present trends continue unabated the collapse of civilisation is inevitable. The future wellbeing of humankind will require big changes in our social systems.

The Frank Fenner Foundation will be a unique public institution that will promote scientific understanding of the human situation in the biosphere and the vision of a society of the future that is truly in tune with, sensitive to and respectful of the processes of life. This understanding is needed, increasingly urgently, if the world community is to resolve the rapidly escalating global environmental crises resulting from humankind's excessive pressures on nature's systems.

The Foundation will also promote informed discussion between scientists, community groups, politicians, governmental authorities and business groups about the social and economic changes necessary to achieve this vision.

The Foundation will be an independent organisation, with active links with research and educational institutions, government agencies, the business sector and community organisations in the context of human and ecological health. Its headquarters will be in Canberra.

Stephen Boyden's comments on the Frank Fenner Foundation

I see the Frank Fenner Foundation as a metamorphosed NSF, with the same philosophy and aims.

The chief differences between NSF and FFF will be that the latter will attract substantial funding that will support a salaried staff. It will have a much higher profile than NSF and will be much more effective as an agent of social change.

The FFF will be a dynamic and a very interesting institution, and I am convinced it has the potential to make a significant contribution to the radical changes in our culture that will be necessary for the survival of civilisation.

Activities

The Frank Fenner Foundation will carry out three interlinked sets of activities: –

1. Research

Integrative transdisciplinary research aimed at bringing together findings from the natural and social sciences necessary for the holistic understanding of the human situation in the biosphere.

2. Promoting understanding

The Foundation will widely communicate information necessary for understanding the human place in nature and the full spectrum of ecological and health issues confronting our society today.

This information will be disseminated through:

Publications – Booklets, pamphlets, information sheets distributed to government agencies, businesses, NGOs, community groups, schools and educational authorities

The Internet – a website, YouTube etc.

Workshops, courses, public lectures

Articles in the press, appearances on television and radio.

3. Generating dialogue on social change

These activities will focus on the social implications of scientific understanding of the human place in nature and of current ecological and health issues for the future of human society.

The Foundation will convene integrative transdisciplinary discussion and debate on:

(a) the changes in human activities that will be necessary to achieve the transition to an ecologically sustainable and healthy society of the future (e.g. changes in energy use, transportation, food production, forestry practices, manufacturing, consumer behaviour, lifestyles)

(b) the changes in societal arrangements that will be necessary to bring about the necessary changes in human activities (e.g. changes in economic arrangements, the occupational structure of the work force, urban design, government regulations, educational programs).

This dialogue will be achieved through regular workshops involving natural and social scientists, representatives of community groups, governmental agencies and the corporate sector.

The outcome of the dialogue will be communicated directly to decision makers in government and the business sector, to educational authorities and to

the wider public through the Internet, press releases and a journal.

Frank Fenner's vision

The Frank Fenner Foundation will be a permanent memorial to Frank Fenner, recognising his life-long commitment to human health and the health of the natural environment. His work on the pox viruses and his involvement in the World health Organisations program that resulted in the elimination of smallpox are well known, as are his studies in myxomatosis which was so important for the control of the rabbit population in Australia. He was Director of the John Curtin School of Medical Research at the Australian National University before he became the Foundation Director of the University's Centre for Resource and Environmental Studies.

Frank saw clearly the urgent need for much better understanding, throughout the community, of the findings of the life sciences, especially as they have bearing on the wellbeing of humankind and the biosphere. From the 1960s onwards Frank was actively involved in, and strongly supported, a number of community projects based on this view. In particular, he made substantial annual donations to the Nature and Society Forum (NSF) of which he was Patron and an active participant.

This, then, is a timely opportunity to build on the ideas, commitment and stature of Frank Fenner.

Progress with the Frank Fenner Foundation

We are progressing on a number of fronts to establish the Foundation, dealing with regulatory requirements of the ACT government, our charitable status, our new website and the Australian National University among others. We will retain the name Nature and Society Forum until we have cleared the major hurdles.

A sane person to an insane society must appear insane.

Kurt Vonnegut, *Welcome to the Monkey House*

Whose food – Whose land?

There is a new land grab in Africa, echoing the nineteenth century carving up of the continent by European powers. This time the land is being leased by companies wanting to export food and crops for biofuels to countries such as China, India, Japan, Saudi Arabia, Malaysia, South Korea and Europe.

Despite the fact that much of the population of Ethiopia is malnourished, millions of hectares in that country are now leased to foreign companies for flower farms and rice and palm oil plantations. These schemes also entail draining swamps, diverting rivers, clearing forests and moving villages.

Other countries such as Liberia, Mozambique and the Democratic Republic of the Congo have also welcomed this type of foreign investment. The companies often say they are helping the African countries to develop, but the main motive is to provide a secure food and biofuel resource for the investing nation. Rather than growing crops that could not be grown in Europe such as coffee, cocoa and bananas, the new push includes staples such as wheat, rice and soybeans. Half the arable land in Madagascar has been leased by a Japanese company to grow corn and biofuels.

Although governments of African countries welcome this investment, many of the locals do not. Reports by Human Rights Watch have documented arbitrary arrests, rapes, beatings and killings of local people who resisted leaving their own villages to make way for the new comers in the Gambela region of Ethiopia. There is also starvation amongst those displaced.

Richard Schiffman, *The Canberra Times*, 30 December 2013

We need positive thinking to get positive change. Telling people that climate change could lead to millions of deaths does not lead to the changes we need to make. To get that change it would be better to focus on the beneficial aspect of mitigation such as technological development or promoting a more cooperative society. Research has shown that scientific evidence is unlikely to convince sceptics of the reality of climate change. Focussing on negative consequences is less successful than providing positively framed rationales for change.

New Scientist*, 23 June 2012*

The trouble with the world is that the stupid are cocksure and the intelligent are full of doubt.

Bertrand Russell

Australian coal

'Coal is the single greatest threat to civilisation and all life on this planet.' James Hansen 2009.

Australia is undergoing a coal boom. As if it were not bad enough that the new Australian government is dismantling legislation that had shown some success in reducing domestic greenhouse gas emissions, the coal industry plans to more than double coal exports. Forty years ago, Australia exported less than 2 million tonnes (mt) of coal annually but in 2012, Australia exported 316 mt. By 2025, the mining companies hope to export between 520 and 689 mt annually.

World demand for coal rose 5.4 per cent in 2011 alone, with China responsible for much of the increase. Australian exports are crucial for meeting this demand, producing one third of the world's traded coal, including half the world's coking coal for making steel. Should the industry have its way in doubling exports, emissions from Australian coal will be more than those from Saudi Arabia's massive exports of oil.

Coal is now the largest single source of greenhouse gas emissions in the world, supplanting oil for the dubious honour. Climate change is now occurring faster than scientists predicted, so unless coal is phased out we are likely to face catastrophic climate change. Yet attempts to rein in the industry have been utterly inadequate. In Australia, the coal industry has enormous power, mounting expensive advertising campaigns against measures such as the carbon and mining taxes.

A radical expansion of coal mining is underway in the states of New South Wales and Queensland. The two state governments openly court the coal industry and do their very best to facilitate the building of roads, rail lines and port terminals to speed the coal exports, often riding roughshod over community concerns and environmental impact assessments.

In some parts of Australia, mining is having a devastating effect, economically and environmentally. The mining industry competes with other industries, not least agriculture, by sucking up capital and construction capacity, as well as labour. For instance, the coal industry monopolises the rail network in Queensland, forcing farmers to transport their grain by road which is more expensive. In the Hunter Valley in NSW, one dairy farmer had milk from her cows rejected by the dairy company because it contained dust blown across from an open-cut mine. Residents are moving because the sound of blasting and the dust from mines have become intolerable. Wineries, horse-studs and tourism have all suffered. Respiratory problems are several times higher in some towns than the national average.

The most insidious effect of coal mining is in Queensland, in its effect on the Great Barrier Reef. Expansion of ports along the coast requires dredging, stirring up toxic mud. In Gladstone, for instance, it killed record numbers of fish, dolphins, turtles and dugongs. The number of coal ships plying the inner reef will quadruple in 20 years, with increased risk of collisions. It is the emissions from the burning of the coal, however, that will do the most damage to the Reef through warming seas and acidification. The Reef is a World Heritage listed site and a delegation from UNESCO (UN Educational, Scientific and Cultural Organization) declared in 2012 that Australia had failed to proprly protect it.

[From the book **"Big Coal"** by Guy Pearce, David McKnight and Bob Burton. NewSouth Publishing 2013. Thanks to Jenny Goldie for passing this on.]

Perhaps nothing encourages stupidity more than the practices of certain businesses.
Andre Spicer and Mats Alvesson had set out to investigate how prestigious organisations managed highly intelligent people. But over and over in their studies, they found the same pattern emerged: certain organisations –notably investment banks, PR agencies and consultancies – would hire highly qualified individuals. But instead of seeing these peoples' talents put to good use, the opposite happened. Spicer said "we were struck by the fact that precisely the aspects they'd been trained in were immediately switched of", a phenomenon they branded as functional stupidity.
For example, organisational practices regularly shut down the employees' risk intelligence. There was no direct relationship between what they did and the outcome. The result was that potentially brilliant employees left logic at the office door. This was evident in the great financial crisis. The employees knew there were problems with mortgage-backed securities, but if they raised concerns the employees faced discipline, so they ignored the problems and went on with the dodgy transactions.

Sally Adee, New Scientist, *30 March 2013*

Refugees and us

Are Australians kind and generous people or are they selfish and mean? Our current treatment of refugees would indicate the latter. The Government declares that 'We (that is the Government) will decide who comes to Australia' and 'We will turn back the boats'. We, or at least our Government, categorise these boat people as being economic migrants, when many of them are fleeing dangerous, war-torn countries such as Afghanistan and Sri Lanka, which is apparently still dangerous if you happen to be a Tamil. All of us would want to escape from such situations.

Anyway why should we spurn economic migrants when we know that it has been economic migrants from the gold rushes to the post World War II boom who have made modern Australia what it is today. Indeed most of the people the Government actually wants to let into the country are economic migrants.

Sometimes, listening to the news we could imagine that Australia is being swamped by refugees, forgetting that millions of people are fleeing Syria alone, and living in refugee camps in neighbouring countries. Millions more are on the move in Africa to escape wars or starvation: many trek long distances on foot, taking enormous risks, to try to reach a place of safety. Refugees flee across the Mediterranean Sea, and far more have been drowned there than in the sea between Indonesia and Australia.

Despite the Government's rhetoric, only about one per cent of the world's refugees are trying to get to Australia at present. This situation will change as climate change and sea level rise really bite. We can expect many more will try to get to Australia from Pacific Islands, and from the delta areas of South East Asia, as these become uninhabitable from the encroachment of the ocean.

Australia is showing a determination to mine and export as much coal as possible, with its new and enlarged coal handling facilities in Queensland. We will be judged as guilty in the eyes of the world when people wake up to the real damage that is being done by burning coal. Our own consciences should make us much more hospitable to climate change refugees.

Neo-liberal politics is incompatible with radical emissions reductions, she argued, because it had 'reduced citizens to consumers' and led to 'a concomitant infantilisation of the electorate'.

Jane Hindley, University of Essex
Radical Emissions Reduction conference
London December 2013

Climate of the nation

A report issued in July 2013 by the Climate Institute, showed that, at least at that time, Australians had a much better understanding of climate change than the current government gives them credit for. Twice as many people trusted the science, compared with the number who doubted it.

A majority of the population thought that climate change was already having an impact here and that this country should take a lead in finding solutions to the problem. They realised that extreme weather is very costly, with adverse effects on crop production, food supply, water shortages and insurance costs. They recognised that climate change will also drive refugee movements.

Opposition to climate pricing was dropping, with more than half the respondents being in favour of pricing carbon than being opposed to it. Strong majorities recognised the danger of increasing carbon emissions. They also recognised that there were economic opportunities in moving to renewable energy. This recognition cut across the major political parties.

Support for coal and nuclear power was down, and people were divided over gas. Solar and wind power were both supported.

Success

To laugh often and much;

to win the respect of intelligent people

and the affection of children;

to earn the appreciation of honest critics

and endure the betrayal of false friends;

to appreciate beauty;

to find the best in others;

to leave the world a bit better; whether by a healthy child,

a garden patch or a redeemed social condition;

to know even one life has breathed easier because you have lived.

This is to have succeeded.

American –
early Twentieth Century

The future of energy supplies

In July 2013 the Australian Academy of Technological Sciences and Engineering ran a conference entitled “Nuclear Energy for Australia?” Reporting on this conference in *Australasian Science,* 0ctober 2013 Dr John Sonderbaum argued the case for nuclear generation of electricity in Australia.

His points included the following arguments. Nuclear energy is a viable technology. It will help to reduce emissions: nuclear energy is the only proven zero emissions technology that can replace fossil fuel for base load generation. Nuclear risks are well-studied and manageable. The public has concerns which must be discussed, but rational and open argument can address these concerns, especially if a robust regulatory system is put in place.

He added that modelling by the Bureau of Resource and Energy Economics suggests that nuclear energy is cost competitive. It is also environmentally attractive in terms of significantly reduced carbon and other emissions.

Dick Smith also supported nuclear power during a long program on energy futures aired on 1 August last year. He pointed out that Australia is addicted to burning coal here, and to selling it overseas: it is indeed a mainstay of the Australian economy. This is bad for the environment, and also for people who live or work near coal mines and coal transport, because they have a significantly increased risk of lung cancer. In Smith’s opinion we must leave most of the remaining coal and oil in the ground, but to do so he thinks we will need to use nuclear generation.

The idea that coal and oil should be left in the ground is an excellent one. But what is missing from the arguments of both of these gentlemen, is the understanding that nuclear power is far from free of greenhouse gas emissions. For one thing uranium has to be mined. Mining is an energy intensive business, using not just large oil fuelled excavators, and heavy road or rail transport. Crushing rocks is also costly in energy terms, and as high grade ores are used up, so the fuel use in crushing lower grade ores increases.

Then there is the storage of waste products in very strong containers, and the transport and burial or other deep storage, all of which involve other energy costs. Along the way there is great use of concrete, and in the unfortunate case of an accident at a power station, even greater use of concrete, as at Chernobyl and Fukushima. The burning of limestone to make cement is itself a huge contributor to our greenhouse gas emission.

So complete accounting of the emissions costs of mining, transporting, storing and disposing of nuclear ores and waste would certainly not show it as free of such emissions. Indeed, the same is true for almost all alternative energy technologies. Some are better than others, but none are emissions free.

Dick Smith, in his program, had said that the promotion of renewables was more fanciful than real, because proponents were not accounting for the full cost of renewables. It is also true that the mining of the special metals needed in many of the renewable is often at considerable cost to the environment, as it is occurring in environmentally sensitive areas.

So we can agree with Dick Smith on that, but disagree with him about the benefits of nuclear power. These proponents for nuclear power have completely ignored the most important option we have: to reduce our energy use, to use what we do use most efficiently, and to do without.

As proponents of better building point out we can build better buildings, properly oriented to make full use of sunlight, and with natural air flow, to provide comfort throughout the year. We can even dress for the seasons, and put up with a little seasonal variation without reaching for a power switch.

We can improve transport, and use less of it, by redesigning our cities and our lifestyles. In short, we can make energy efficiency, and local self-sufficiency, our goal. We must learn to live within Earth’s limits, and stop treating the planet as a mine and a rubbish dump.

I am always a bit bemused by anyone who looks to immigration to alter the age structure of a population to provide more ‘workers’ in comparison to the elderly dependants. They do not seem to understand that immigrants grow old too. The only way to have a comparatively young population is to increase the death rate among the retired population - in other words to have shorter life spans. No one really thinks this is a good idea, at least not for themselves and their friends. The answer to the problem is really to extend working life - get rid of a compulsory retirement age, and employ older workers. Or at least to recognise that many of the elderly perform roles that are actually of great benefit to society, paid or not paid.

Jenny Wanless, 2013

Nuclear power cost

In warning about the consequences of the likely catastrophe resulting from a nuclear accident, Naomi Hirose from Tepco introduces a new concept into risk analysis – the prospect that the price of any serious accident would be too great to pay.

Risk analysis indicates that the risk of a nuclear accident is extremely small. However, if that remote chance occurred, could we afford to pay for the consequences? If you take the case of Hinkley Point: a serious meltdown accompanied by a large release of radioactivity into a westerly wind would probably render much of southern England uninhabitable. The costs, both economic and social, would be totally unsustainable.

Any such event is extremely unlikely, but the awareness of the possibility of a meltdown did not deter the flawed "safety" test at Chernobyl, which rendered a huge area of the Ukraine uninhabitable, nor prevent the construction of a reactor close to the sea in an earthquake/ tsunami zone at Fukushima.

> *If we don't halt population growth with justice and compassion, it will be done for us by nature, brutally and without pity – and will leave a ravaged world.*
>
> *Nobel Laureate Henry W. Kendall*

Thus to normal risk analysis, should we perhaps not add the further criterion: can you afford to pay the price if the extremely unlikely actually happens?

Peter Borrell, letter to *The Guardian Weekly,* 13 December 2013

Dark sky park

The northernmost stretch of England, from Hadrian's Wall to the Scottish border has been declared Europe's largest dark sky park. The International Dark-Sky Association in the USA awarded the area gold-tier status, in recognition of the effort of the local councils, residents and businesses in cutting any local light pollution. Not only will this result in great night time viewing, attracting amateur astronomers and astro-tourists, but it will also protect the night-time environment for wildlife.

The Guardian Weekly, 13 December 2013

If only it was so easy!

The outcome of introducing a species into a non-native ecosystem will be very unpredictable, although it may seem predictable in a computer software.

Gunjan Pandey, *Nature*, 1 February 2012

The world won't listen

How did the rational arguments of science and economics fail to win the day? There are many reasons, but an important one concerns human nature.

Through a growing body of psychological research, we know that scaring or shaming people into sustainable behaviour is likely to backfire. We know that it is difficult to overcome the psychological distance between the concept of climate change – not here, not now – and people's everyday lives. We know that beliefs about the climate are influenced by extreme and even daily weather.

One of the most striking findings is that concern about climate change is not only, or even mostly, a product of how much people know about science. Increased knowledge tends to harden existing opinions (*Nature Climate Change*, vol 2 p732).

These findings and many more, are increasingly available to campaigners and science communicators, but it is not clear that lessons are being learned. In particular there is a great deal of resistance towards the idea that communicating climate change requires more than explaining the science.

… Research has shown that people who endorse free-market economic principles become less hostile when they are presented with policy responses which do not seem to be as threatening to their world view, such as geoengineering. Climate change communicators must understand that debates about the science are often simply proxy for these more fundamental disagreements.

Some will argue that climate change discourse has become so polluted by politics that we cannot see the scientific woods for the political trees. Why should science communicators get their hands dirty with politics? But the solution is not to scream ever louder at people that the woods are there if only they would look properly. A much better, and more empirically supported, answer is to start with those trees. The way to engage the public on climate change is to find ways of making it resonate more effectively with the values that people hold … such as the beauty of the local environment, or the need to enhance energy security.

Extracts from an article by Adam Corner in *New Scientist*, 28 September 2013

Farrago

Sea level change

Stephen Battersby, in the *New Scientist* for 4 May 2013, stressed that the simple view of sea level rise as uniform around the world, is very misleading. The main cause of sea levels changing will be the melting of the Greenland and West Antarctic ice caps – but as ice sheets melt the land under them slowly rises in a process known as isostatic rebound. A well known example of such rebound is that Scotland is still gradually rising as a result of the removal of ice at the end of the last ice age.

Less well known is the fact that Ice sheets exert a gravitational attraction on the seawater around them, so that the sea level is higher near the icesheet than it is further away, thus as the ice melts the water level will actually fall. This effect and isostatic rebound have both been known for a considerable time.

There are other possible effects of the melting of ice sheets, such as changing the planet's balance, shifting the axis of rotation, which would in turn tilt the equatorial bulge, further complicating any sea level changes. All this means that sea level rise will not be uniform, and levels will probably fall in some places, possibly by 100 metres around Greenland, and 10 metres around Ireland, although there will be a rise for most of the rest of the world.

Feral cats

Let there be no mistake – feral cats are a huge problem and are very widespread. It's a situation that requires immediate action because it could lead to a massive loss of biodiversity. Across the continent it's estimated there are 15 million feral cats killing 75 million native animals every night, so it's very important that we get a better understanding of their hunting patterns.

Dr Graeme Gillespie, NT Terrestrial Ecosystems, *Australasian Science*, Jan/Feb 2014

Points of view

When we destroy something created by man we call it vandalism, but when we destroy something created by nature we call it progress.

Ed Begley, American actor and environmentalist

Vines versus trees

In a famous poem Tennyson characterised Nature as red in tooth and claw. William Laurance, of James Cook University in Cairns, attests to an equally brutal battle in the plant world in his article 'Planet of the Vines' (*New Scientist*, 5 October 2013), although we have to admit that tendril v trunk would not sound very violent.

According to Laurance the world's forests are changing. Until the last decade or so the balance between trees and vines seemed fairly stable. If a forest has been disturbed, whether by elephants testing their strength, by trees falling in storms, or by humans logging, then vines will spring up in the clearing. But for the most part an intact forest would consist of trees. Now woody vines, the lianas, are taking over even in intact forests.

> *Surplus productive land would grow surplus babies, so do culturally and religiously retarded values.*
>
> *Margit Alm, internet discussion post 5 September 2013*

Vines are the trees' enemies because they invest almost no energy in growing a supporting structure. Instead they attach to a tree and use it as a trellis while racing up to the sunlight to grow as many leaves as possible while their roots deplete the nutrients and water around the tree's roots. Lianas in particular can tie trees together, so that if one falls it will probably pull down other trees with it.

One possible explanation for the vines' success is that tropical forests are becoming more dynamic, with trees dying and regenerating more rapidly. This could be because the weather is getting more violent with stronger winds and storms fuelled by climate change.

Another factor could be the rising concentration of carbon dioxide in the atmosphere. This would be fuelling faster photosynthesis so the plants grow more rapidly and compete more strongly. But rising CO_2 could also favour vines directly, with more growth of leaves and little investment in supportive tissue.

It is not only the big trees which are being disadvantaged in these changed conditions. Other casualties include ferns and other epiphytes that live on trees. These plants tend to be hosts to their own small ecosystems of distinctive fauna, which will be lost if their hosts are lost.

Furthermore a takeover by vines would reduce the carbon storage that forests offer by locking up carbon in their trunks. When vines kill or suppress trees, carbon is released back into the atmosphere, creating yet another feedback loop.

Robots tending solar farms

Near the Santa Rita Jail, in California, a robot is helping to provide the jail with solar power. This is SolBot, and it runs on a rail underneath the rows of panels in a solar field, stopping at each panel to adjust its tilt to maximise the solar gain.

The sun moves across the sky, taking forty minutes to move ten degrees, so SolBot keeps moving and with the aid of its sensors pinpoints the sun's position to within one degree, and adjusts each panel individually. One robot can manage about 1200 panels on its own. This avoids the need for expensive tracking equipment, and makes the solar field about twenty per cent more efficient than the roof-mounted panels that are also part of the jail's micro grid.

Alion Energy, a solar power company in Richmond, California, is using robots to help install panels, and also to clean them. The company installs the concrete bases that the panels will stand on, and also the guide rail for robots. Then Rover the robot takes over, gluing the panels in place along a row. A human then loads Rover with the panels for the next row. Once all are in place, Spot the cleaning robot takes over the task of keeping the robots clean, so they can get maximum sunlight. Spot would be particularly useful in desert areas such as the Middle East, and western China, where dust can reduce the efficiency of solar panels by forty per cent. The robots cost only a quarter as much as human cleaners, and would also reduce water use by ninety per cent.

We sometimes seem to confuse big (resources) with infinite (resources).

Letter to New York Times
21 September 2013

New Scientist, 17 August 2013

A sustainable landbase

In *Endgame* I explained that a culture that requires the importation of resources cannot be sustainable. In order to be sustainable, a culture must help the landbase, but if your culture requires the importation of resources from another landbase, it means you've denuded the local landbase of that particular resource. In other words you have harmed your landbase, and are using that harm as a reason to harm another one. This is by definition unsustainable.

As cities – which require the importation of resources – grow, they will plunder ever larger areas.

Lierre Keith, *Deep Green Resistance*, 2011

Deadly trio

The oceans are suffering from a deadly trio of threats, with a lack of oxygen in the water being added to the better known ills of warming water and acidification from the absorption of carbon dioxide. Scientists from the International Programme on the State of the Ocean (IPSO) have reported that all three threats have continued to grow over the last couple of years. If this continues then coral reefs will all be destroyed within some fifty to a hundred years.

The decrease of oxygen in the water is caused by the fact that warmer water holds less gas than cold water. Also warmer water is less dense than colder water, so a layer of warm water will ride on top of cooler water with very little mixing, resulting in oxygen-poor deeper water that can suffocate life on the sea floor. The result will be marine ecosystems increasingly taken over by jellyfish, pathogenic microorganisms and toxic algal blooms.

Fred Pearce, *New Scientist*, 12 October 2013

Geothermal energy

Geothermal energy does not seem to rate a mention in the discussion of Australia's energy options, yet there are opportunities there. Dr Rachel Webster is an astronomer who is also interested in what is under our feet, especially in Victoria. Where there is elevated heat near enough to the surface to be reached by drilling, which is about four kilometres depth, then that heat can be used as an energy source to heat water.

Because coal is an excellent insulator it traps the heat generated by radioactivity deeper in the crust, so hot rocks are often found under coal seams. This fact has been known for some time, and prompted some interest in generating geothermal energy by pumping water down to depths sufficient to turn it to steam which would drive turbines at the surface to produce electricity.

Webster is part of teams that are exploring the possibility of using the rocks of the La Trobe Valley in this way. They are also suggesting that it could be possible to reduce the amount of brown coal used at the Loy Yang Power Station by preheating the water geothermally before it enters the power station.

Australasian Science, October 2013

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 March 2014.

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. The editor welcomes contributions of suitable 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