Nature&Society

The Journal of the Nature and Society Forum August - September 2005

Editorial

Is your glass half empty or half full? Are you a pessimist or an optimist? Several readers have commented on how depressed they are about the state of the environment and how pleasant it was to read something optimistic in the last journal; the editorial and Gösta's 'People and houses' were mentioned.

Realists tend to be pessimistic: things really are bad, worse than most people realise. NSF member Graham Chittleborough's updates on his environmental assessments certainly are gloomy. They show that things are getting worse at an accelerating rate. Already the deep water circulation in the Antarctic is changing and this will change the global patterns. The lack of upwelling water, which brings nutrients to the surface layers, is reducing krill populations. The shortage of krill is adversely affecting the Adelie penguins. Other krill-eaters, including baleen whales, will suffer: so will penguin-eaters! The consequences extend far from the Antarctic. Everything in nature is connected.

> *In many ways, events today mirror those almost two decades ago, when the big producers of CFCs, who for years denied their products were destroying the ozone layer, decided after all that a CFC ban would generate a new market in substitutes that they were well placed to exploit. The signs, we fervently hope, are that US companies are approaching a similar tipping point in the climate change debate.*
>
> *New Scientist, 4 June 2005*

John Donne wrote 'No man is an island'. He was right in a wider context than he could have realised. Humans have caused environmental disasters ever since they started using fire and tools. This effect is now much greater because our power is greater. Our quest for luxuries rather than necessities causes ever more havoc.

Chittleborough points out that a poor farmer, growing rice with his own labour and that of a buffalo, managed to produce about one joule of rice energy for about one joule of his own energy. In contrast our much extolled modern food production is grossly inefficient. Even decades ago prawning trawlers and crayfishermen expended huge amounts of fossil fuel to put small quantities of prawn or crayfish meat on the plate. Their inefficiency fell in the range of 80 to 130 joules of fuel energy to one joule of food energy. The larger the ship the worse the ratio. Antarctic whaling would be considerably worse.

These seafoods may be the worst case, but broad acre farming also has a high inefficiency ratio and in addition mines the soil of minerals which then get thrown away. Our misuse of words like 'efficiency' and a lack of understanding mask these problems.

So there is not a lot to be optimistic about. On the other hand gloomy prophets throughout history signally failed in getting their message across. Action that can inspire people and make them feel that they can make a difference is a good way to go. Fortunately there are many people who are working hard to make a difference. There are engineers, architects, farmers, business people who are making changes that inspire.

In Britain top business leaders from twelve companies are pushing for long-term policies to reduce carbon dioxide emissions. In the USA some large corporations, over 150 cities and

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some states are taking action to cut emissions. They are doing so despite the Federal Government's failure to act too. There is much that local government can do but it would be all the more effective with emissions trading, Government regulation and carbon taxes.

Governments often fear to act as they think there will be a backlash from business, or a set back in the economy. While governments are vacillating some peoples' movements are taking steps to help people prepare for likely changes. In response to the imminent oil shortage, Economic Localisation gatherings are being held in some parts of the USA. They are positing the end of suburbia as we know it, and the need for local self-sufficiency. If the Australian-based Race to Sustainability takes off it will mean many communities will be better placed to withstand the troubles ahead. Of course, NSF's own activities, the National Sustainability Initiative, the Sustainability Science Team and our education activities are all working to make the future a better time than it would otherwise be.

> *The debate is over. We know the science. We see the threats posed by changes to our climate. And we know the time for action is now.*
>
> *Arnold Schwarzenegger*

But relief could come from an unexpected quarter. California, with Arnie Schwarzenegger at the helm, is taking a lead. During his first weeks in office he approved more than twenty new environmental bills. He is pushing solar power in California. He is suing the Bush administration to enforce many federal environmental policies that are still on the books. California is powerful, populous and has a large economy. It may carry great weight with the President, especially as Schwarzenegger is a Republican, too.

Thus, on environmental matters, while our glass is certainly not half full – maybe a quarter full – it is important to realise that some good things are happening and to celebrate and encourage those. Depression engenders despair and a lack of will to try to improve things. The more communities that take action, the softer the landing for them when the crunch comes.

Jenny Wanless

The NSF library

New in the library this month are a number of classic books including Galbraith's *The Affluent Society*, Flannery's *The Future Eaters* (the hardcover edition with all the illustrations), Diamond's *Guns, Germs and Steel* and Schumacher's *Small is Beautiful*. Thanks to Jenny Wanless for these donations during July.

The library is used regularly by a number of NSF members and is also drawn upon by scientists engaged on projects for the Sustainability Science Team.

We now have more books than our existing shelves can hold. Enlargement and reinforcement of the shelves will cost around $300 and we would be grateful for a donation to house this growing resource.

The NSF Committee 2004-2005

The Management Committee comprises Rory Eames and Wendy Rainbird (co-ordinators), John Schooneveldt (interim treasurer), Jenny Wanless (secretary), Ian Anderson, Andrew Chalklen, Brett Odgers, Dierk von Behrens. Please contact any committee member to discuss the work of NSF or to offer support for our activities (see p 4).

NSF Annual General Meeting

The AGM will be held on Wednesday 21 September in the NSF rooms in Weston. With this copy of Nature and Society, there is a form members can use to nominate other members for the NSF Management Committee in 2005-2006.

An important position becomes available at the AGM: the position of NSF treasurer. We are looking for a person who would be able to take this on for the coming year.

The reverse of the form displays the revision to the membership fee structure proposed by the Management Committee for adoption at the Annual General Meeting. Members are invited to comment on the fee revision to the NSF office or directly to any of the Committee members.

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Tel: +61 (2) 6288 0760

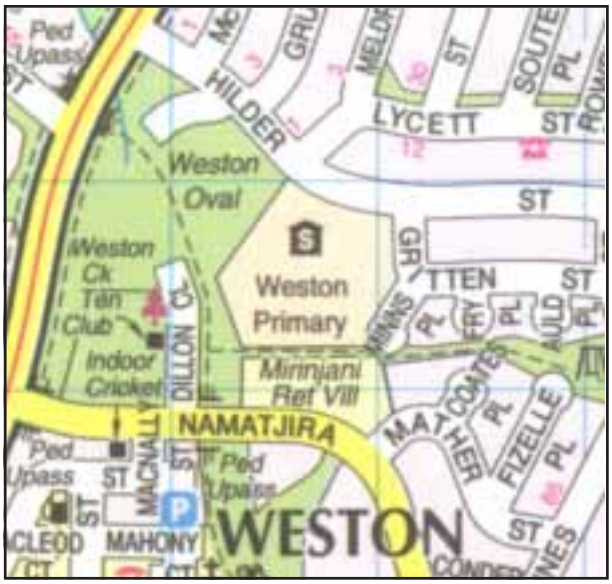
Fax: +61 (2) 6287 4489

E-mail: office@natsoc.org.au

Website: www.natsoc.org.au

Where we are:

Our meeting room and office is in the south-west wing of the Weston Park Primary School.



To come from Civic, follow the signs to Weston from the Tuggeranong Parkway and continue to Weston by veering left from the Cotter Road turnoff traffic lights. This takes you along Streeton Drive for exactly one kilometre, then turn left into Hilder Street (there is a small signpost pointing along Hilder Street). Drive around behind the school to the right into Minns Place and into the car park. Our rooms are down the slope to the left of the building - about 40m from where you'll park the car.

There is space for three or four cars for disabled access close to the entry. There is a ramp over the kerb from this small parking space and entry to our building is without steps.

Forthcoming NSF meetings

Time and venue: Our members' meetings are generally held at 7:45pm on the third Wednesday in the month at the NSF meeting room in Weston. However, for the August meeting the date has been put back to Wednesday 24.

Our 24 August meeting gives us an opportunity to hear from members of the Australian National Sustainability Initiative when Brendan Mackey, the president, together with Janis Birkeland and David Hood update us on progress with the Initiative, particularly the Complex (previously the Biocentre) and the support for it from business, government and others.

Our 21 September meeting will be the Annual General meeting of Nature and Society Forum. Among the topics to be discussed is the following changes to the membership fees and the introduction of a suggested structure for donation levels.

The existing fee structure:

Member category	*Fee*	*GST*	*Total*
Standard membership	$27.27	$2.73	$30
Concession membership[1]	$13.64	$1.36	$15
Corporate membership	$45.46	$4.54	$50
Life membership	$272.73	$27.27	$300

Proposal for the AGM:

Member category	*Fee*	*GST*	*Total*
Standard membership	$50	$5	$55
Concession membership[1]	$20	$2	$22
Corporate membership	$100	$10	$110
Life membership	$500	$50	$550

Suggested member donations[2]	*Don-ation*	*GST*	*Total*	*Notes*
Giant Petrel	$36	$0	$36	= $3 month
Galaxias	$60	$0	$60	= $5 month
Corroboree frog	$120	$0	$120	= $10 month[3]
Tasmanian Devil	$260	$0	$260	= $5 week[3]
Spotted Quoll	$365	$0	$365	= $1 day[3]

[1] Concession for pensioners and students

[2] Donations are entirely voluntary and support the activities of NSF; they are in addition to membership fees

[3] These donations could be paid by monthly deductions from credit cards.

More details of the above structure is provided on the insert in this copy of Nature and Society.

The 19 October meeting will be an opportunity to hear about innovative initiatives in Canberra which have been raised with the help of NSF's 'Sustainability and Health' project undertaken on behalf of Healthpact.

Promoting 'healthy people on a healthy planet'

The Australian National Sustainability Initiative, ANSI, is on the move

ANB board member Janis Birkeland has become involved with the new ACT chapter of the Australian Green Development Forum. David Hood, an engineer who heads the ACT chapter, was keen to become involved with the Centre or - as it is more accurately known now – the Complex.

The complex plan includes the landscape relating to the buildings, entry park, recreation area, entrance building, education central hub and four modules for smaller groups, display park and indoor display area, outdoor theatre, walkways and waterways that form a transition to the wetlands, eco-accommodation and office space for ANSI, the sustainability network, NSF and their related activities.

The input of humans can result in major ramifications that echo through evolutionary times.

Prof David Bowman, field ecologist and Dr Barry Brook, population modelling

David Hood has been welcomed to the ANB Board.

Members of the ANB board gave a well-received presentation to the ACT Sustainability Expert Reference Group, which reports to the Chief Minister. In the following weeks David Hood, Brendan Mackey and Janis Birkeland gave a presentation to Engineers Australia. The three have also been busy meeting with the National Capital Authority, Business ACT and setting up a meeting with the ACT Land Development Authority.

Talks have also been held with developers who are keen to be involved in a complex which has 'beyond current best practice' sustainability in its design.

Your chance to see and hear about ANSI and the latest developments

Brendan Mackey, Janis Birkeland and David Hood will give a presentation on ANSI at the members' meeting on Wednesday 24 August at 7:45pm at Weston.

Sustainability and Health Strategy for the ACT

NSF received a Healthpact grant to:

1. Develop a whole-of-community strategy for making the connections between sustainability and health in terms of living healthily into the future.

2. Establish a consortium of advocates for sustainability and health in the ACT.

A planning group has been meeting regularly since May to brainstorm the approaches and to gather a list of key people to form a working group from across the community who are likely to take action.

3. Conduct a meeting with the working group on 17 August.

Healthpact is looking to fund projects which will advance the benefits of sustainable development for the people of the ACT. The first meeting is to inspire and initiate diverse, community-based projects consistent with Healthpact's mission.

4. Develop a capacity for joint monitoring of sustainability and health outcomes in the ACT.

The planning group is to hold two workshops on 12-13 September to develop a series of projects and to apply for grants that they hope will identify practices that are truly sustainable and lead to deep and practical change.

Achievement of such changes would surely make Canberra stand out from most other cities globally.

'The Future's in our Hands' series in the Canberra Times

This series, which ran weekly for six months, had many articles written by NSF members. Underpinning these articles has been a challenge to Canberrans to come to grips with the significant changes needed to reach sustainability and health in our community and globally.

The NSF Annual General Meeting is on 21 September

Members will have the opportunity to discuss some necessary changes to membership fees and donations. Elections will be held for positions on the Management Committee and the NSF Annual report will be tabled.

Wendy Rainbird
NSF Coordinator

War and nuclear power

Sue Wareham, president of the Medical Association for the Prevention of War (MAPW), was our speaker for July. She had set herself quite a task: to talk about the environmental effects of warfare as well as the links between nuclear power and nuclear weapons. Sue started with an overview of the environmental effects of war, a topic that rarely rates a mention with the media or in public discussion. Yet surely, anyone seeing pictures of war planes in action, tanks rolling across the countryside or burning oilwells must think of the enormous outpourings of greenhouse gases (not to mention waste of precious fuel) that these images show. The Pentagon is one of the largest consumers of oil in the world.

In Sue's overview of the topic she listed the huge consumption of fuel in both training for and conducting warfare. There is also great use (and waste) of iron, steel and other metals (and the production of these is energy intensive). There is much disruption and destruction of habitats and wildlife. Harm is caused by chemicals such as defoliants deliberately used to damage the environment, and many other chemicals incidentally poison air, soil and water.

> *Of all races in an advanced stage of civilization, the American is the least accessible to long views. . . . Always and everywhere in a hurry to get rich, he does not give a thought to remote consequences; he sees only present advantages. . . . He does not remember, he does not feel, he lives in a materialist dream.*
>
> *Moses Ostrogorski*
> *Democracy and the Organization of Political Parties, 1902*

The damage to human habitats includes the targeting of chemical and industrial facilities. Landmines and unexploded ordinance pose a huge threat to humans and other animals. Farmland is lost and so, too, are many of the botanical species including locally specialised food crops (land races).

Depleted uranium munitions leave nuclear waste and are suspected of causing cancer. Refugees, driven from war zones, impose additional stress on neighbouring areas as they must use whatever they can to survive.

And then there are nuclear weapons. Just developing these weapons, without using them in warfare, has cost more than 1,900 tests which have contaminated land, sea and air, with concomitant damage to life. The radiation will continue essentially forever (in human terms); we cannot remove it. The best we can hope for is to cease nuclear weapons production and get rid of every existing such weapon. This is the only way to prevent some miscalculation, human error, or accident resulting in the launch of a missile.

Next Sue turned to a question that is becoming very relevant in a world where many people are urging the necessity for turning to nuclear power to provide for our insatiable demand for electricity. Can we get rid of nuclear weapons in a nuclear powered world?

In Sue's opinion nuclear power would probably be a good idea if it were not for the following problems:

- nuclear power is one of the most expensive ways of producing electricity
- the mining and enrichment of uranium, fuel fabrication, transport, reactor construction, operation and decommissioning all use fossil fuels
- the health and environmental hazards of uranium mining
- the hazards of transport
- problems of waste disposal
- the consequences of an accident
- the possibility of terrorist attacks on a nuclear facility
- the security needed to guard nuclear materials, and
- the links between nuclear power and weapons.

The last item on this list is of major importance. The technology needed to develop nuclear power and nuclear weapons is similar in nature. The same facilities used for producing low-enriched uranium for power can be used to make high-enriched weapons-grade uranium, and it can be hard to know what the full purpose of any enrichment program is.

The Nuclear Non-Proliferation Treaty (NPT) is one of the few instruments that can hold nuclear states to their obligation to disarm, but

it has a major flaw. It actually promises the 'inalienable right' to access nuclear technology, while promising an end to nuclear war. So a country like Iran has an "inalienable right" to such technology and the International Atomic Energy Agency is asking Iran to forego a 'benefit' that it is entitled to as an NPT member. Any country can legitimately remain a member of the NPT, until its research is so advanced that it can withdraw from the treaty and proceed to weaponisation.

In the discussion after Sue's talk concerns were expressed about some notable environmental thinkers, such as James Lovelock of Gaia fame, recommending that we should choose the nuclear route because global warming is an even greater threat. This recommendation underestimates the long lead time needed to build and commission sufficient numbers of nuclear power stations if they are to cater for ever-growing energy demand and to replace fossil fuel plants. But it also ignores the nuclear industry's fossil fuel use. One estimate is that it takes ten years of a nuclear plant's production to write off its carbon debt when its uranium supply comes from high grade ore. Low grade ores require far greater energy costs in their mining and treatment. Contrary to popular perception high grade ores are not abundant and could be mined out in about two decades.

> *Interestingly, network theory tells us that the drive to make systems like power grids and company organisations as lean and efficient as possible often produces a network structure that leaves them vulnerable to catastrophic failure in the event of minor unforeseen mishaps.*
>
> *In such systems managers may have the illusion that they are in control but the results of management intervention are often unpleasantly counterintuitive and surprising.*
>
> *John Finnigan, CSIRO's Centre for Complex Systems Science*
> *Australasian Science, June 2005*

Dismissing the danger of possible, even if unlikely, accidents at nuclear power stations, or the use of nuclear weapons, is very unwise. The nuclear industry and governments have always been secretive, and downplayed the harm caused by accidents. Also just one nuclear device causes radiation damage over huge areas and for all realistic time scales. We should never forget Hiroshima and Nagasaki.

Lastly, if nuclear power is such a good idea, why are private companies not rushing to develop it, and why will insurance companies not have a bar of it?

In contrast to nuclear power, energy efficiency and alternative technologies can be introduced quickly. Many are ready to go right now and with a mass market they will get better and be cheaper to make and install. Unfortunately a major change in the thinking of the dominant culture is necessary to shift us onto this track.

For those who are interested in the nuclear question, Sue gave us copies of the International Physicians for the Prevention of Nuclear War *Rethinking Nuclear Energy and Democracy after September 11, 2001*, and MAPW's *Australia and the NPT 2005: Getting serious about ridding the world of WMDs*.

Thank you Sue, for the evening and for the books.

Jenny Wanless

Food miles

'Food miles' have risen dramatically over the past 10 years, are still rising, and have a significant impact on climate change, traffic congestion, accidents and pollution, according to a report published by the Department for the [UK] Environment, Food and Rural Affairs (Defra) yesterday.

Food miles increased by 15% in the 10 years to 2002. The average distance we now drive to shop for food each year is 898 miles, compared with 747 miles a decade ago. Food transport accounts for 25% of all the miles driven by heavy goods vehicles on [UK] roads. The use of HGVs to transport food has doubled since 1974.

The dramatic increase has resulted in a rise in the amount of CO_2 emitted by food transport: 19m tonnes of carbon dioxide were emitted in 2002 in the course of getting our food to consumers, a 12% increase on 1992, the report says. Airfreight, the most polluting form of food transport, is growing fastest.

From an article by Felicity Lawrence
The Guardian, 15 July 2005

The following article is the first of a series of articles that will appear in *Nature and Society* and also be backed up with a page of information on the NSF internet site. The article is available for download from the site where it will be continually up-dated in response to comments from NSF members and other readers. The article was compiled by a number of NSF members and a larger number contributed to it. The intended audience is the wider Australian population as well as NSF membership. Additional copies are available from the NSF office - see page 10.

The first in the series, on 'peak oil', presents a topic that has emerged with increasing public concern over the past 18 months. Although peak oil has had little coverage in the mainstream Australian press, books and DVDs on the topic have been best-sellers and it has featured in the UK newspaper *The Guardian*.

Peak Oil

There are two reasons for acting now to reduce sharply our use of fossil fuel energy. Firstly, there is the contribution to global warming of carbon from burning fossil fuels. Secondly, there is *peak oil* which will force us to adapt – desirably in ways that do not also worsen global warming.

What is peak oil?

Oil started running out when the first oil well started flowing. Peak oil is the time when oil production peaks worldwide and our ability to extract oil is overtaken by our demand for oil.

Once we reach peak oil, extractors will no longer be able to keep up with increasing demand. This article outlines possible problems this could force upon us and suggests how we might deal with them.

When will peak oil occur?

Best estimates are that peak oil will occur around 2008, though some say 2005. The early effects of peak oil are being felt now; others may take years to appear.

Why should I be concerned about peak oil?

In the past century enough oil was extracted to meet demand because the supply was growing. This will no longer be true after peak oil. So peak oil represents a change in the conditions that have underwritten economic growth as we know it and the growth of population from one to six billion.

After peak oil, oil extraction will decrease steadily until it is effectively all gone in about forty years. There will still be oil left but it will take more energy to get it out than it can provide as fuel. The oil interval in human history will be over.

Will this just mean higher petrol prices?

Higher petrol prices will certainly be one consequence. But oil is so ingrained in the way we live that the implications reach much further. The material welfare of our society and our belief in progress is based largely on drawing down natural capital, including oil.

Transport of goods: Because oil is used to transport food and the goods of our consumer society from all over the country and globe, we can expect their prices to rise.

Transport for people: Living in a suburb will become more difficult when car use is less affordable than today. Air travel and tourism generally will be similarly affected.

The economy: Because energy prices and the economy are so closely linked, a recession is possible, accompanied by inflation, rising consumer debt and increased unemployment.

Products and materials: Oil is used to produce plastics, medicines, packaging, synthetic fabrics, road surfaces, cosmetics, detergents and most modern comforts.

The environment: We use fuel oil energy in our repair of environmental damage. An oil shortage could lead to looser (or flouted) environmental controls and plundering of resources, including forests.

Security: Demand for oil is rising in Western nations and also from the emerging economies of China and India. The nations with oil reserves may become more assertive. Military forces are profligate users of oil.

Aren't we discovering more oil?

Yes, but not enough to keep up with what we're using. Worldwide discovery peaked in 1964. Each year since 1964 we have discovered less than the year before.

We have enough oil to last forty years. What's the problem?

Though we will still be extracting oil for another forty years, following the peak our oil production will decline steadily. Forty years is not a long time to come up with alternatives.

Surely they'll find a technological fix?

There is a difference between technology and energy sources. Technology provides ways to use energy; it can not create energy.

Alternatives to oil

There are no alternatives to oil which provide a comparable amount of energy for the energy it takes to produce them – and to transport that energy to the user.

Oil currently has an average EROEI globally of around 5:1, but it's declining (EROEI – energy return over energy invested. When EROEI becomes less than 1:1, it shows that more energy is used to produce the fuel than the fuel provides).

Natural gas (mainly methane) is also approaching its global peak. It is difficult to import and store in significant quantities and requires high-tech support and maintenance.

Coal is abundant and good for generating electricity. But it requires fuel oil for its mining, distribution and waste (ash) disposal; this places electricity supplies at risk. Coal is unsuited for powering cars and too dirty for domestic use. Burning more coal would worsen global warming.

Nuclear power can generate electricity, but there is only about forty years of disclosed uranium reserves. Mining uranium is oil-fuel intensive as is building (which takes around ten years) and decommissioning reactors. Safe storage of nuclear waste for thousands of years is an unsolvable problem.

Hydrogen is not a source of energy; it's a carrier of energy, like a battery. There are no extractable hydrogen reserves. It takes a lot of energy to produce, mainly from fossil fuels and is almost impossible to store. Fuel cells contain oil-based materials.

When and how to act

Immediately. When the oil supply falls, the shortages, price increases, and disruptions of industry and transport may frustrate your most effective preparations. Make time now.

You should act at three levels: nationally (even internationally) with leaders and NGOs, at your community level (however you choose to define your community) and at a family and personal level.

Society and nation

Open discussion of peak oil by all governments and the media is needed. Politicians appear to be keeping silent deliberately as they shy away from breaking 'bad news'.

Until this discussion occurs, many people may deny – to others and themselves – the reality of peak oil. Perhaps governments shelter behind the deniers or interpret our silence as apathy.

Disaster-relief for earthquakes, cyclones, bushfires, tsunamis, epidemics, floods etc. may be less effective (if 4WDs and helicopters are rare) and recovery far slower.

Although other nations will, like ours, have less fuel to support military operations, their desire for productive land may be the focus of diplomatic or even military action.

As governments face new internal and external challenges, they may legislate new powers.

Community

Because governments are not preparing for peak oil we need to take the lead.

Our lives will centre more on our local community, despite telecommuting. These communities will have to become more self-sustaining. In effect, the process of economic globalisation will reverse as an economic re-localisation begins.

Your neighbours are your best insurance. Learn how to live with them and deserve their trust. This may mean changes in your own behaviour.

Join actively in community groups including Neighbourhood Watch.

Discuss bartering with your neighbours – vegetables for firewood, child-care for house minding, garden space for home help, swapping surplus items etc.

Help the unemployed people in your neighbourhood to focus on activities which will benefit the community.

Consider banding together to recycle grey water, work a community garden, preserve food, pool skills, care for elderly neighbours.

Value older people. Nurses who trained before antibiotics, carpenters who trained with only hand tools and people who recall survival through the Depression and wartime shortages are invaluable resources.

Fire, ambulance, police and council services may be less responsive, so we should reduce our related risk exposures.

Economy

As fuel prices rise and fuel shortages occur, supplies to shops will become unreliable and our spending patterns will change accordingly. Marginal businesses could suffer and their redundant staff will find it hard to secure other jobs if overall unemployment rises.

Companies with large oil budgets for transport or for raw material (fertilisers, plastics), those which sell non-essentials (brand fashions, up-market audio, travel, gifts) or which rely on large car parks to attract customers may contract. Civil engineering, tourist motels and motor sports may be among those contracting when input prices rise or demand falls.

As businesses are affected, their shares may lose value and people who depend on share income – including those on superannuation – may find their incomes falling. Businesses that cannot pay their debts often take some creditors down with them.

People whose skills you depend upon (teachers, tradespeople, doctors) may have withdrawn from the workforce to make their own preparations for peak oil changes.

We cannot predict for how long national currencies will remain stable and accepted. Local currencies and LETS may emerge.

Families should put their finances in order: get out of debt, put aside enough to pay 2-3 months of mortgage or rent, keep up to $500 in cash in case blackouts disable EFTPOS and ATMs.

Property values will fall in urban areas, especially in commuter suburbs (which depend on cheap oil) and in apartment blocks (which lack scope for self-sufficiency and depend on gas or electric heating, air-conditioning and security).

Property values of smallholdings that are environmentally well-endowed will rise.

CBDs, which depend on affordable commuting and deliveries and energy intensive buildings, may suffer. Local businesses in low rent suburbs and towns will open.

New businesses will start in renewables, retrofitting and local services. Cottage industries and co-operatives may form, staffed by recently redundant volunteers. Con-men will find opportunities.

Location

Large concentrations of people (over 250,000) could become unstable faster than communities of less than 30,000 people. Do what you can to foster smaller communities.

If you can do so consider relocating – sooner rather than later. Relocating could help you to reduce your mortgage.

Shifting to a warmer location may appeal but it could be subject to weather vulnerabilities due to climate change. Moving to the country may isolate you from specialist services: medical, cultural, family, religious, markets for your products.

To relocate successfully, think first of what you can contribute to any new location, not what it can give you. Be open to ideas of common land ownership.

Adequate soil, water, and growing seasons are more important than a nice view.

Look for neighbours with complementary skills, interests and age groups.

Most localities have laws that restrict your ability to prepare: siting of water tanks, home renovations, sewage treatment and disposal, keeping farm animals in towns, growing hemp, tax disincentives.

Shelter

Retrofitting existing dwellings, energy-free home heating and cooling and much more are described in Derek Wrigley's *Making Your Home Sustainable*.

Sharing homes with lodgers or extended family may increase, especially if by-laws and tax disincentives change.

Install a solar hot water unit.

Security

The time of transition to a post-cheap oil world may be an unpleasant period. Those whose careers or lifestyles are threatened may act in bitterness or despair. Decide in advance how you will respond.

Does your community have reasonable policies on work seekers, squatters, the ill, old people and the homeless? Rationing?

Health

There will be fewer medicines and most hospitals can be expected to go from high-tech to low-tech.

We'll be walking, cycling and using our muscles more. This should improve our health overall.

Apply a continuing exercise program that will fit you for an active life, rather than body sculpting and slimness.

Water

Expect that you will need to reduce your use of water. Washing water can be used on some plants, but generally should be treated to remove the chemicals in the detergents.

Grey water systems that don't rely on electric pumps should be considered where water supplies are marginal. These systems are most effective in communities of 40-300 dwellings.

The water connected to your home, even if pumping continues, may not be treated. You may want to filter water yourself.

Reduce water use by installing a dual-flush or composting toilet.

Food

Food and water shortages could lead to deficiency diseases, thefts and disturbances.

Industrialised food production depends heavily on fertilisers and chemicals made from oil. Tractors and fishing boats are powered by oil as is food transport. We currently use ten calories of fossil fuel energy to produce one calorie of food energy.

Expect there will be fewer groceries, and that you may increasingly need to eat what you grow yourself or exchange with neighbours, possibly using the Community Supported Agriculture model.

Permaculture provides a – and possibly the only – sustainable form of food production.

John Jeavons' books show how to grow a healthy diet on an area as small as 100 sq metres per person. These techniques take effort and time.

Consider transforming lawns to orchards. Familiarise yourself with storable low-effort staples like potatoes, beans and pumpkins.

Your food program may have setbacks at times because of drought, neglect or lack of knowledge. You therefore need stored food. Food storage should not be dependent on electric refrigeration as blackouts are possible.

By growing and bartering surpluses of foods you grow well you can help build community spirit.

Pet food may be scarce.

Recycling

Collection, sorting and recycling of domestic waste is dependent on oil. Expect fewer collection and recycling services for households and businesses.

Learn to recycle *everything* on your own block or in your neighbourhood. Do not bring to your home anything you cannot recycle.

Electric power

Most electricity is generated from fossil fuels. When fossil fueled centralised power-generation fails, the remaining hydro, wind, solar etc. systems will be unable to meet the present demand.

Approach the coming power shortages in three ways: progressively reduce your electricity needs, increase your muscle-power use and add home power generating capability.

You should begin reducing your electricity consumption now, learning how to cope in the way that best meets your needs and resources.

Solar photovoltaic panels continue to improve in efficiency but they cost about $700/kw. Their output fluctuates with weather conditions and a power storage system is usually required. They are relatively expensive and require siting with a solar orientation.

Windmills to generate electricity can be bought or built. But they generate power only when wind is blowing or use batteries.

Fuel cells can generate electricity from a variety of fuels.

All systems for generating electricity, the batteries to store it and most of the machines and products that it powers use oil-based parts and need skilled people to produce and maintain them.

Fuels

The end of cheap oil does not mean the end of all fuels for machines. It means that fuels will become increasingly scarce and expensive and will need to come from renewable sources.

Most renewable bio-fuels entail a tradeoff in the use of cropland and require fertilisers and oil for harvesting, processing and transport. They also require a stable economy for their large scale production and distribution.

The greater part of humanity will need to rely more on their own muscles, or the labour of animals.

Heat for homes will not be as cheap and convenient as it is today; effective insulation is the first step to take. We won't be taking for granted cooking and hot drinks.

Self-sufficiency

You should anticipate that our society could be less stable and ordered for a long period.

There are many good books on self-sufficiency, like those of John Seymour.

Consider a wind-up radio. Crystal sets need no batteries and can be made at home. Ham radio may help those with skills and supplies.

With quality hand tools, a careful, patient beginner can make a real contribution, fixing a jammed door, repairing a tap or gardening.

There are items available and cheap today that could reasonably be stored, but may soon become scarce: nails and screws, clothing, sewing supplies, tools – even bricks.

Encourage your acquaintances to stock up so they don't need to call on you; ask them to pass the same message on to their acquaintances.

Transport

Fuel for personal transport may be rationed or priced out of reach, as limited supplies are reserved for farming and emergency services.

Heavy vehicles will remain for some time but, due to limited fuel, might be available only for large businesses or governments.

In calories of food/fuel consumed per km, the bicycle is the most efficient vehicle. In its early development, it was seen as a serious means of transportation but became overshadowed by fossil fuel engines. Various bicycle designs, including load carriers, are used worldwide.

Plan your 'neighbourhood' around achievable walking or bicycling distances.

Knowledge and skills

Skills in survival, crafts and living have to be learned through experience; they cannot be quickly or fully picked up from books.

Practical people will be at an advantage. Be flexible and adaptable; acquire, practise and master useful new skills.

Books and other printed material are the simplest means of holding knowledge. Electronic media, whether CDs, tapes, disks, etc., all require a functioning player.

Currently knowledge is just a click away on the web. Download all that appears helpful to you, and print the main items.

Acquire the books you have valued in your education and subsequently; use your local library regularly including inter-library loans for books and articles not held locally.

Protect stored documents from silverfish, moths and mould. Use acid-free paper.

How long will problems last?

It may take years before many realise the age of cheap oil is over, and decades before we stabilise. Jim Kunstler's *The Long Emergency* has a telling title and is an excellent resource to begin planning for a sustainable and positive future.

Isn't much of the above fanciful?

We cannot know what the future will bring, though we can predict that the future will be uncertain and, in some respects, volatile. The suggestions above are not firm, but they are all possible. They demonstrate how cheap oil permeates our economy, lifestyle and ways of thinking. But even in a worst-case scenario, peak oil pales beside the threats from climate change and the draw down of natural capital, which affect the entire biosphere, not just aspects of human society.

It is a human characteristic to concentrate on immediate threats and ignore those that lie further in the future. If you are concerned by peak oil, spare your best thoughts and most decisive actions for climate change.

Further information

There are active peak oil groups in Sydney and Canberra. Further information is available from the Peak Oil page on the NSF website and in these books and DVDs:

Matthew Simmons:*Twilight in the Desert: The Coming Saudi Oil Shock and the World Economy*

Richard Heinberg: *Powerdown - Options and Actions for a Post-Carbon World*

Richard Heinberg: *The Party's Over: Oil, War, and the Fate of Industrial Societies*

Colin Campbell: *The Coming Oil Crisis*

The End of Suburbia (DVD - US)

Peak Oil - Imposed by Nature (DVD - UK and Norway).

Additional copies of this peak oil information are available from the NSF office.

Size of reprint	Up to 5 copies	6 - 20 copies	21 - 100 copies
Single A4 sheet (small print)	free	$5.00	$10.00
Single A3 sheet (as above)	free	$7.50	$15.00

Can human ethics survive an Orwellian science fiction world?

Reflections on the Science and Ethics conference, 17-18 May, 2005

Following presentations at the recent conference on 'Science and Ethics: Can *Homo sapiens* Survive' organised by Manning Clark House at the Australian Academy of Science, in honour of Frank Fenner, this article reflects on aspects of the current global strategic, social and economic impasse and its consequences for the natural world, and on an alternative philosophy of Kenosis as promoted by cosmologist and ethicist George Ellis, who recently visited Australia.

Most organisms in nature are symbiotic; only a few destroy their host like some infectious bacteria, or foul their nest like the kingfisher and the ironically called *Homo sapiens.* The advent of the industrial age has enormously accelerated human-caused environmental degradation, mainly through deforestation, for example around the Mediterranean, in Easter Island and New Zealand. Nowadays we are looking at the 'logical consequences' of such behaviour. As stated by the International Union for the Conservation of Nature: 'The rapid loss of species that we are witnessing today is estimated by some experts to be between 1,000 and 10,000 times higher than the background, or expected, natural extinction rate (estimated at one species every four years)'.

> *Happiness is the ultimate good and all other goods are good because of the way they contribute to happiness. And if I asked you why do you think freedom is good, you'd probably say 'Because people feel terrible when they're oppressed, and they feel much better if they have control over their lives'. But if I then asked you 'Why does it matter if they feel better?' you might be stumped for an answer – the reason being that it's completely self-evident. You see it's self-evident to humans, because of the way we're constructed. Happiness matters in a way that's not true of any other good.*
>
> *Professor Richard Layard interviewed at the London School of Economics March 2005*

The rise of an opportunistic carbon-emitting species, armed with doomsday machines, raises the question of the biological sanity of the species. If nature's main aim is for species to propagate their young, the activities of *Homo sapiens* deprive future generations of a liveable environment. The human mind seems to be obsessed with activities which appear to have little to do with a liveable future. An example is the pursuit of gold – a token in whose name civilisations were destroyed in several parts of the 'new world'. At the ideological roots of environmental abuse are the myths of the Earth being a mere corridor to heaven and its modern equivalent space age adventures. An overpopulation explosion representing a combination of traditional taboos and medical science is counterbalanced by rituals of human sacrifice called 'war'. In question is the concept of free will which assumes a species can reverse its biological course.

In his classic novel '1984' George Orwell portrays three superpowers perpetually at war with each other in switching alliances, each ensuring absolute dominance over their respective populations through disinformation, fear and coercion, achieved by the dissemination of untruths, e.g. '2 + 2 = 5 if the party says so!' Gore Vidal observes popular opinion is the most potent force in societies and Doris Lessing perceives the most insidious aspect of the manipulation of opinion through mass brain washing is the unawareness by the majority of this very fact. In a world where the boundaries between reality and myth, science and science fiction are increasingly blurred, clarification of realities and issues – as attempted in the conference – is timely.

Given the evidence for chemical and radioactive pollution of the atmosphere, hydrosphere and soils (culminating in climate change amongst other things), increased consumption and technological fixes continue to be promoted as cures by vested interests through massive commercial advertising. Commercial and political propaganda, which amount to the same thing, promise material wealth, leisure, longer life, democracy, conquest of space – the list goes on, resulting in mass fads and fetishes. What is not disclosed is that the technology already exists for application on a large scale of non-polluting energy – solar, wind, geothermal and tidal. If such transformation requires an economic cost, namely by lowering the high living standards in suburbia, at least initially, would such cost be considered too high by the population? Further, amelioration of the environmental damage caused by over 150 years of industrial pollution

requires the diversion of funds from the trillion dollar military, space and other adventures, to the planting of trees. What is required is not new technology but a fundamental *change of attitude.*

More than too-little-too-late solutions are hardly possible as long as the world's dwindling resources continue to be channeled into global military machines. Peace is anathema to Empires, ancient and modern. By analogy to the Roman Empire, which had to keep the legions in constant distant wars so that they did not turn on Rome itself, the latter day global empire requires a semi-permanent state of war. Long term intervention in the Middle East and other regions and criminal mass bombing of populations (some 3 million killed in Vietnam), or blockade of countries (some 500 000 children died of lack of medicine in Iraq), are countered by equally criminal suicide bombing by insurgents, and thus the world is hijacked between opposing fundamentalisms, each aspiring for total dominance. In a world which continues, despite false promises, to be overshadowed by the nuclear mushroom – the greatest terror of them all – in a truly Orwellian Newspeak a war-on-terror has become a motto. War and terror are equally murder, on different scales, one under national flags the second under some religious or other banners.

> *The fundamental argument for redistribution of income is that an extra pound makes more difference to a poor person than to a rich person. Therefore the average happiness goes up when we take it from the rich and give it to the poor. That is something we can do.*
>
> *Professor Richard Layard interviewed at the London School of Economics March 2005*

Recent developments aim at a science fiction world wired to listening devices, video surveillance and missile fleets targeting any point on the globe from submarine or space stations. Instead of strengthening international institutions such as the United Nations and negotiating the root causes of misery, hunger and injustice, emphasis is placed on recipes for open ended conflicts. This would not have been possible had not the information channels been taken over by vested interests. An example of a totally fraudulent kind of war is the war on drugs, an almost purely medical problem which through legislation has been translated into a source of billions of dollars for drug smuggling mafias and security forces. There is little difference between the war on drugs and the, now conveniently forgotten, US prohibition on alcohol earlier last century. The health risks posed by alcohol, tobacco and other drugs are best mitigated through medical clinics, education and job opportunities – costing so much less than those which find their way to mafias and cops.

An example of a media-propagated fetish is the space cult. In the recent 'Entertainment and Design' Conference in Oxford, Peter Diamandis proclaimed:

> Humans have a moral imperative to open up space as a new frontier … If you think about space, everything we hold of value on this planet is in infinite supply there … Earth is a crumb in a supermarket full of resources … The cost of getting into orbit is the key to human survival, wealth and prosperity.

Which is in the tradition of theologies which see Earth as merely a corridor to heaven, the Eldorado myth and the wild west mentality. Quite apart from taking the resources needed for space travel from the mouths of hungry children under the pretext of the search for life, space ideologues never answer the question as to what is going to happen to the 'Indians' of an invaded planet? Attempts at 'playing God' by a species driven by age-old yearnings for immortality and omnipotence, fed by an overgrown neo-cortex, are belied by the poor credentials of predatory *Homo Sapiens* as a planetary gardener.

Is the growth-at-all-cost imperative a deterministic Darwinian reality, all the way from the DNA to the GNP, or can ethical human choices intervene in this process? Should not the trillions of dollars misused for the military and space colonisation projects be better used to repair the damage the species has already inflicted on the terrestrial biosphere, for example through the planting of trees, solar-energized desalination, drip farming and sustainable marine farming, instead of creating extra-terrestrial havens for a privileged few fleeing a devastated planet? Can human destructiveness be arrested through the abolition of tribal conflicts, through education and the enhancement of social justice, or are such ideals only pipe dreams?

A philosophy of ethics which, in principle at least, would allow for human survival through the achievement of peace and harmony with nature is expounded by George Ellis – the physicist and cosmologist. According to this philosophy, rather than being an essentially empty and occasionally violent void, the cosmos

is inherently life-giving and life-enhancing. In a bio-friendly universe, while stars explode in supernova, volcanoes erupt and comets impact, life is forever regenerated in a myriad forms, springing from the cosmic design itself. As in Hindu mythology, Vishnu, Brahma and Shiva follow each other in infinite cycles of creation, preservation and destruction. In this sense life is sacred since the universe itself can only be observed through intelligent eyes, namely 'we can observe the universe only from places and times where intelligent beings exist and can have evolved', or by a strong anthropic (human) principle where 'intelligent life must exist in the universe – it is a necessity' (Murphy, N. and Ellis, G., 1996. *On the Moral Nature of the Universe*).

Murphy and Ellis see the relations between the natural sciences, social sciences, ethics and theology as intrinsically related in a hierarchically ordered world. Here morality is inherent in objective natural realities. In a moral universe ideally the onus is on individuals to self-renunciate and self-sacrifice their right of self defence, since only ultimate pacifism accords with God's original design. Only such behaviour will guarantee survival for a species which has mastered the electromagnetic spectrum, discovered the strong (nuclear) force, and undertaken genetic engineering.

Whereas Murphy's and Ellis' philosophy is hugely attractive to humanists, essential question marks remain. Given the affinity of *Homo sapiens* to the natural world (98.6 per cent of genes shared with the great apes, Diamond, 1991), the question arises how can the conflict between the 'food chain' (so-called) and universal ethics be reconciled? The predatory, even cannibalistic, behaviour of a myriad species of insects, fish, birds and mammals – with whom *Homo sapiens* is intrinsically linked – presents a challenge to the concept of a 'moral universe'.

Are these issues subject for resolution by a single truth or manifold truths? Are objective scientific truths indifferent to human aspirations, or is there a subjective human truth on which our emotional survival depends in an otherwise hostile 'food chain' dominated world? Are our life-enhancing aspirations, myths and illusions – including that of a merciful God or a moral universe – essential for survival in otherwise humanly impossible situations?

Personally, the form of truth to which I am inclined, consistent with Sartre's and Camus' existentialist philosophy, hinges on thankfulness for the moment, the day or year of awareness of the world around, not depending on a loving God or a bio-friendly universe. Inherent in this ethic is a sense of gratitude for the privilege of gaining a glimpse into the wonders and horrors, the beauty and the cruelty, of this planet and of creation, as symbolized by Sisyphus rolling the stone up the mountain all day long, to be rewarded only by momentary awareness of the setting sun. In Camus' words: 'We must assume Sisyphus happy'. The gift of transient life, not to be sacrificed, has a meaning and a purpose. As the universe's intelligent eyes, as expressed by Paul Davies: 'We are meant to be here'.

Andrew Glikson

I know I've been called a totalitarian by one former Chancellor yesterday, and one conservative journalist the day before. And what I said to them is, Well, do you agree that the best society is the happiest? They say Yes. Do you agree that we should try and find out what makes people happy? They say Yes. So I say, Therefore, do you not think that if we really knew what made people happy, we should use it as a basis for policy? They say No. This is opening the door, this is the foot in the door of the totalitarian State.

Professor Richard Layard interviewed at the London School of Economics March 2005

Making Canberra Sustainable

Following the successful May conference on Science and Ethics (See above), Manning Clark House is arranging a public forum entitled Making Canberra Sustainable, to be held at Old Canberra House, ANU, on 17-18 October 2005.

The forum will comprise a series of presentations followed by workshop discussions in the general areas of Place, Human Health and Wellbeing and the Built Environment, seeking to open a co-operative dialogue between government, business and the community in the direction of a sustainable future for Canberra.

Program and registration details may be obtained from Manning Clark House (Ph 6295 9433).

Bryan Furnass
Forum Co-convenor

African adventures

Steve Burroughs, our July speaker, told us a story unlike any other we have heard at our meetings. Over a ten year period he worked in a large number of African countries. During that time he has been threatened with death by knife and gun, knocked to the ground and savagely kicked. He has experienced conditions that most of us cannot begin to understand.

Through it all he has been learning how differently things have to be done. Overseas-trained experts, even when they are locals, have to unlearn some of their western training and learn what is needed and what will work

We hope to have an article on Steve's work in the next edition of Nature and Society.

Farrago

Elevated levels of atmospheric carbon dioxide, while increasing crop yield, decrease the nutritional value of plants ... when CO_2 builds up in plant tissues, nitrogen, trace elements (such as zinc and iron) go down, potentially malnourishing all those that subsist on the plants ... At least a third of the world is already lacking in some chemical element ... due in part to a steady diet of micronutrient-deficient green-revolution plants ... Plant nutrient deficiencies might destabilize the world's wild ecosystems in unexpected ways ... Added CO_2 tends to drive up the production of many plant non-nutrients such as tannins and other phenolics ... The obvious way to reduce the risk of declining food quality is to cut fossil fuel emissions.

Glen Scherer
Grist Magazine, 25 July 2005

> *We've been able to show a biologically plausible reason whereby wherever humans go, with whatever level of technology they can get their hands on, there will be a corresponding inevitable extinction of animals because humans change the environment more quickly that the animals can adapt.*
>
> *Prof David Bowman, field ecologist and Dr Barry Brook, population modelling*

Smoking disorder

In Brisbane in June this year medical students were told of young women in that city smoking during pregnancy specifically to avoid having 'fat babies'.

Salt-tolerant wheat

Sea barley grass is a wheat-relative that has an ability to aerate its roots in waterlogged soil. It is also salt-tolerant.

In an effort to breed these desirable traits into wheat, the Grains Research and Development Corporation is supporting research aimed a crossing sea barley grass with common wheat. If they can get a hybrid with these traits and with edible grains, then it would greatly expand the arable areas of Australia.

Australasian Science May 2005

Jamming cholera

It was reported some years ago that research into compounds called furanones was finding a successful method to prevent films of slime forming in catheters and other medical devices. Seaweeds produce furanones as an anti-fouling device; they block the signalling system by which bacteria communicate with their fellows to form colonies on surfaces.

Now a furanone produced by *Delisea pulchra*, an Australian seaweed, has been found to block the signalling system used by cholera bacteria. The bacteria apparently seek safety in numbers as, if only a few bacteria released toxins, the host's immune system would overwhelm them. Instead the bacteria wait until there is a critical mass, hundreds of thousands of their fellows, before releasing their toxin. Blocking their signalling system would prevent this build-up.

Golden staph and tuberculosis bacteria rely on similar communications systems, so there is hope that furanones will be effective against these diseases, too.

As the bacteria are not harmed in any way there is no selection pressure for the development of resistance. Indeed, through a million years of evolution no bacteria have developed resistance to furanones in the natural environment.

Australasian Science May 2005

Integrated systems

Aquaculture is booming around the world, growing ten per cent per year and expected to provide a quarter of total fisheries production by 2010. But much aquaculture relies on fishmeal for feed; fishmeal is expensive and will be in short supply. The Environmental Biotechnology Cooperative Research Centre thinks it can help.

Researchers at the CRC are working on emulating nature by developing closed systems in which waste from one agricultural process is used as a resource in another one.

The prototype model will use piggery waste, recycling nutrients for fish and plant production in aquaculture systems. Nutrients from these will then go on as soil fertilisers and enhancers. Carbon wastes would be used in biofuels and good quality water would be available for reuse.

Integrated systems of this kind could produce enough power for their own use and even feed electricity back into the grid.

Australasian Science, July 2005

Advertising

Ever notice how advertisers have a laser-like ability to home in on anything that has credibility, and then become a parasite that slowly eats away its host's insides? The latest example of this dynamic is McGraw-Hill's idea of putting advertising in university textbooks. Promoting their idea they write: *'Reach a hard to get target group where they spend all their parents' money. Do you really think 18-24 year olds could miss an ad that is placed in a very well-respected textbook?'* The company plans initially to charge as much as $1.40 per book, and the ads would be inserts, instead of being placed permanently alongside text.

I can hardly wait until Microsoft starts advertising in computer science textbooks; Ford pitches its SUVs in forestry school books; and professors start wearing corporate logos on their tweed jackets like tennis stars and football players.

From: http://onthecommons.org/node/595

Phyto-fuels

What are the requirements for a really satisfactory fuel? To replace oil it needs to be liquid at normal temperatures and easily transported and used. It should have high energy density and be suitable for aviation.

There is only one candidate on the horizon and that is scum. This would be bioengineered plants, probably algae, that produce a very high proportion of oil. These could be grown in tanks or water bodies that are not useful for other purposes. A range of algae could be engineered to thrive in fresh, brackish or salt water, to suit different conditions. All would need plentiful sunlight.

At a later stage it should be possible to learn how the algae do it and produce phyto-fuel directly by photosynthesis without the intermediate plants.

Ockham's Razor, Radio National 19 June 2005

We discovered there are 101 different ways to extinction. It can be by overhunting, destroying habitats with fire, fixating on big animals as trophies, and there may have been some environmental disturbance – climate change, drought and so on. But humans were always in the mix. It remains an inescapable fact that the extinction of the megafauna wouldn't have unfolded without humans being there.

Prof David Bowman, field ecologist and Dr Barry Brook, population modelling

The Take

A new film called *The Take* is being released in August. It is about the occupied factories movement in 2001 in Argentina. Argentina had suffered run-away inflation, the economy collapsed, factories were shut down. The former workers decided that their factories were sitting there, unused, waiting for the workers to return and run them.

The workers reopened about 200 factories. They had a deep lack of faith in bosses and politicians. Instead of the usual pyramidal structure they organised themselves on democratic lines: one worker, one vote. These factories are still operating and running well. They are employing more people and the country's economy is doing much better.

ABC, Radio National, 16 July 2005

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,
6 Millen St, Hughes ACT 2605, ph 02 6281 3892, by 15 September 2005.

Contributions may be sent electronically - no formatting, plain text only. This journal was prepared using Office XP and PageMaker 7.0.2 (Windows). Contributions may also be sent on paper.

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.

This issue was prepared by Jenny Wanless, Gosta Lynga and Keith Thomas.

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