

Nature & Society

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February - March 2009

Editorial

The New Year was ushered in with the now standard fireworks, millions of dollars going up in smoke in city after city. It was also ushered in with millions more going up in smoke over the Israeli/Gaza Strip border, costing hundreds of lives and great suffering.

The twentieth century was noted for some of the bloodiest wars in history. This century is seeing continuing warfare, especially in Africa and Asia. The future will bring more of the same, triggered by old and new animosities, allied with greed over resources and need for water and food. There will be floods of refugees from war, and from environmental causes including climate change and sea level rise.

Wars have always been with us. They are spurred on by jealousy, ambition and prejudice. Their purpose may be to acquire land, mineral resources, living room. Motives are usually mixed, but they are also usually dressed up in various colours, such as patriotism, or religious fervour.

War is a disaster for the people involved, the soldiers and civilians, the terrorised, raped and starved local populations. Although it is rarely mentioned, war is also a disaster for the environment.

From the Romans salting their enemies' fields to modern landmines and unexploded ordinance, war has caused serious food shortages but also long term environmental damage. As in everything, our modern advances can cause more harm, poisoning plants, animals, water and soil. Modern warfare is also extremely carbon intensive in the manufacture and use of armaments. Even war games, let alone the real thing, carry a high environmental cost, with tanks, planes and ships rumbling across the area, disrupting land, air and ocean life.

Considering all the costs of war it is obvious that the human propensity to wage war is a disaster. If we stopped expending time, energy and money in fighting we could do so much

more to improve the lot of people in every country, Time, energy and money could be devoted to providing fresh water and sanitation, adequate health care and schooling in all countries, while reducing environmental degradation.

But war is so engrained in our species, how can we hope to go against that grain and develop peaceful societies? So many disputes seem to be resolutely irresolvable; is there any hope?

In NSF's Occasional Paper No 6 (1998), John Burton wrote about the History of Conflict Resolution, having previously talked to us at a meeting on the topic. The meeting had provided one of those flashes of light that makes you sit up and exclaim 'Of course, how silly not to have realised that!'

Burton described a test case in the mid-1960s in which Indonesia, Malaysia and Singapore were in dispute. The British Prime Minister Harold Wilson offered to mediate. This public

This edition approaches our fundamental theme of biosensitivity in three main ways:

- The editorial and selected quotations to set us thinking about our screening in February of '*Scarred lands and wounded lives*'
- A celebration of Darwin's life and work for 12 February, Darwin Day
- Further contributions on causes of climate change and what can still be done to reduce its impact.

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offer was publicly rejected. At the time a group of London academics studying international relations had formed a hypothesis *that parties to conflicts would endeavour to avoid the costs of escalation of conflicts and to resolve them if they were placed in an exploratory and analytical framework in which they could explore possible options... This would need to be without publicity so as to avoid charges of weakness by leaders who were willing to negotiate with the enemy, and possibly change perceptions and policies.*

This group, with the knowledge and consent of Wilson, invited the three governments concerned to send nominees to London, for an off-the-record analytical and exploratory dialogue. The invitation was immediately accepted.

The nominees met for ten days in a face-to-face situation controlled by a panel of five scholars. The agenda was an analysis of the situation, with no preliminary proposals. There was no bargaining or negotiation. All three discovered that they shared the same fears and aspirations...After some days they could communicate readily. They returned home. Fighting stopped and diplomatic relations were re-established without any public statements.

It is easy to see why public diplomacy, with news-hungry journalists reporting every move, so often fails in settling disputes. The disputing parties do not want to be seen by their own side as weak. They have to appear strong, resolute and basically aggressive in the light of what their side sees as unfair or outrageous claims from the other side.

Unfortunately it is also easy to see why this method would not be popular with would-be peace brokers. They would have to appear not to be doing anything about the conflict, and put up with being berated in public for their lack of response to the problem. Even if, or when, the conflict was resolved they would not be able to

claim any credit until at least a couple of decades later. This would certainly not be the stuff of political stardom.

It is almost impossible to imagine that such an approach would work in current war zones, where hatred seems so intense, and yet maybe it is our only hope there. If people can be put in a situation where they can recognise the humanity of their adversary, where they can see that each has a need for recognition of their right to exist, a need for safety and other essentials, then maybe fighting could stop.

The approach is certainly something that should be tried in troubled areas before conflicts escalate to open warfare. The same technique has worked well in industrial and community conflict. *Once it was accepted by the parties that there would be no publicity or reporting of any observations made during discussions, at least for many years, changes in attitudes and policies could be made, without any possibility of accusations of being 'weak' or climbing down. The degree to which parties re-perceived the total situation, and the values and motivations of their 'enemy' came as a welcome surprise to those facilitating and observing.*

Practised enough at other levels, such conflict resolution could help humans overcome their lust for war, and develop instead

the side of their nature that relishes cooperation. We have big enough problems to face in the near future without making the problems bigger by fighting each other.

Jenny Wanless

Now a new theory is emerging that challenges the prevailing view that warfare is a product of human culture and thus a relatively recent phenomenon. For the first time, anthropologists, archaeologists, primatologists, psychologists and political scientists are approaching a consensus. Not only is war as ancient as humankind, they say, but it has played an integral role in evolution. The theory helps explain the evolution of familiar aspects of warlike behaviour such as gang warfare. And even suggests the co-operative skills we've had to develop to be effective warriors have turned into the modern ability to work towards a common goal.

Bob Holmes, New Scientist, 15 November 2008

Persuading people to embrace social change

Keynes, when once challenged that his views on some issue were no longer consistent with his previous utterings, replied: "When I am proven wrong, I change my mind. What do you do?"

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Where we are

Room E-319-A in the old building of the John Curtin School of Medical Research at the Australian National University in Canberra.

From the entrance use the intercom phone to call the NSF office on extension 52526.

By car: There is a two-hour car park in Balmain Lane, 300 metres to the south of the office.

By bus: The route 3 bus from Civic drops you off at the foot of Eggleston Road. Walk 250m south up the hill and turn right; from there the entrance to the building is visible.

By bicycle: Plenty of bicycle parking on the ANU campus.

Depression and depression

'An economic collapse is the worst possible time to suffer a nervous breakdown, yet this is so often exactly what happens. Taking an unsentimental look at what is coming up can help put you at the top of your game at a time when everyone around you is reeling in shock and flailing about randomly. This will make you a very useful person, both to yourself and to others, in making the best of a bad situation.'

Dmitry Orlov in *Reinventing collapse*, 2008, p.17. A similar observation was been made in a media release from the Australian NGO 'Beyond Blue' late in January 2009.

Coming NSF meetings

For the latest information visit our website and click on 'What's On'. There you will also find a link to maps to direct you to the venue.

Wednesday 18 February 2009, 7:30pm - Scarred Lands and Wounded Lives

NSF is proud to be hosting a showing of this film about the human and environmental costs of war, at the Optus lecture theatre at CSIRO's Discovery Centre, off Clunies Ross Street, Acton (turn up the hill at the roundabout and follow the signs to the Discovery Centre). This venue will allow us to accommodate a much larger audience than usual.

The film has been produced by Lincoln and Alice Day, NSF members from Washington, DC. It is their contribution to trying to end the stupidity of humanity's repeated recourse to war to 'solve' our problems.

The film deserves a wide audience, so please let other interested people know about the screening. Of course it shows disturbing scenes, that is what it is about. Alice and Lincoln will be present, and they will host a discussion at the end of the film.

The film will start at 7.30, so please be in good time. Its running time is approximately 111 minutes.

Wednesday 18 March 2009 – 7:30 pm – Professor John Sandeman: Can the Murray-Darling Basin be saved from collapse? – Droughts, changing weather patterns due to climate change, unsustainable state and federal government policies, parochial self-interest and blatant diversion of wetland water to agriculture, has brought the major irrigated agricultural region of Australia, the Murray-Darling Basin close to collapse. The present state of the Basin together with the predictions of computer modelling of future climate changes over the next few decades will be discussed in relation to the existing attitudes of vested interests at all levels and the various policies now being undertaken by governments in an attempt to address the major problems. Can the basin be saved? A question closely coupled to our major one: "can the planet be saved?"

The 'What's on' page of our website also includes a summary of NSF events back to 2006 and web links to further information about them.

NSF news

The NSF Office Manager

In the later part of last year the Forum found itself in financial straits that meant we could no longer go on employing Keith as office manager. This was very upsetting for everyone, and many members let us know how concerned they were. After detailed analysis of the financial situation and several meetings, the Board decided that we could employ Keith for about seven or eight hours per week. This arrangement is now in place, so Keith will be in the office for one or two mornings per week. He now has another part time job, and sometimes has to work on call, so his mornings in the NSF office will vary, but will normally be Monday and Wednesday.

Keith himself has tried to keep members up to date by email, but has not had time to contact members who do not have email. On behalf of the Board I apologise to all members who have felt left out during these events. It has been unsettling for all of us.

Jenny Wanless

I will show the world that America believes in its existing commitment under the NPT to work to ultimately eliminate all nuclear weapons.

Barack Obama, September 2008

'You don't let *Nature* and *Science* magazines determine your investment portfolio, so why would you let the *Wall Street Journal* choose your science?'

A biologist friend of Paul Hawkins
AFR Boss, 1 June 2008

Darwin Day is a recently instituted annual celebration intended to celebrate the anniversary of the birth of Charles Darwin on February 12, 1809. 2009 marks the 200th anniversary of Darwin's birth and on 24 November this year it will be the 150th anniversary of the publication of *The origin of species*. The day is also an opportunity to highlight Darwin's contribution to science. For example, we should not overlook Darwin's achievements as a geologist: he worked out how coral atolls formed, and also made important contributions on the elevation of the Andean cordillera, paying close attention to the study of earthquakes and volcanoes.

Events on Darwin Day include a 'phylum feast' — a meal beginning with 'primordial soup' and continuing with foods from as many different phyla as possible, protests with US school boards, workshops and

Meeting report

Evolutionary fitness

Keith Thomas has been exploring and practising the evolutionary health principle for the last five years. Broadly stated this principle says that there has been insufficient time for evolution to equip us to be healthy in an urban or even agricultural society. Our bodies and minds are still essentially the ones developed in our hunter-gatherer ancestors. To be truly healthy we need to eat the same sort of food we ate then, and get similar amounts and types of exercise, otherwise we suffer from the diseases of civilisation.

Because this is not understood, we have nutrition and health sciences that look at parts of the problem and jump to wrong conclusions about what is good for us. A much better approach is to look to evolution as the overarching theory, and ask what we evolved to eat, what lifestyle evolved in those conditions. Zoo keepers know that to keep animals healthy it is essential to provide them with a diet as close as possible to the one they ate in the wild, in conditions that provide for exercise and activity.

The diet of a hunter-gatherer would include variable amounts of meat (from wild animals, fish, shellfish, with relatively little saturated fat, unlike today's farmed animals), many different vegetables, fruit and nuts in season, and almost no grain. All these would have been obtained by means of physical exertion,

symposia, distribution of information by people in ape costumes, lectures and debates, essay and art competitions, concerts, poetry readings, plays, reenactments of the Scopes Trial and of the debate between Thomas H. Huxley and Bishop Samuel Wilberforce, library displays, museum exhibits, travel and educational tours, church sermons and nature hikes. The Darwin Day Celebration Web site is <http://www.darwinday.org> and has information about 253 events listed in 30 countries.

The Perth Mint will produce a 2009 dated commemorative 1oz silver coin depicting Darwin, young and old, HMS Beagle and Darwin's signature.

On the following pages of this edition of *Nature and Society* we have included quotations by and about Charles Darwin as footers to each page

often in a social setting – think a gaggle of girls out gathering berries, or fossicking for roots, or the camaraderie and mutual reliance of a group of hunters.

The question is not what grandma would have recognised as food, but what would your umpteenth great-great-grandmother and grandfather have recognised? The answer provides a definition of a good diet, with a physically active body and an engaged mind, a complete recipe for good health.

If the health sciences want to make progress they need to study evolution; it will be a much better guide than the current approach. It would prevent the nonsense we have sometimes been fed, that you need one type of diet to prevent heart disease, and quite a different one to prevent cancer. In evolutionary terms a healthy diet, a hunter-gatherer diet with appropriate exercise, will provide the best diet for the body and mind.

While determined people can choose to eat something like the hunter-gatherer diet, it is unlikely they can actually get the same mix of exercise and rest, especially if they are working in our conventional workforce. However, Keith points out that we do not have to live 100% as our Palaeolithic ancestors did to get the benefits of evolutionary fitness. All we need to do is identify the key aspects of diet and exercise and apply these. Keith has developed his own style of exercise to do in a gym. Much of it does not involve conventional gym equipment, but if it does, he uses

Nevertheless the doctrine that all nature is at war is most true. The struggle very often falls on the egg and seed, or on the seedling, larva and young; but fall it must sometime in the life of each individual, or more commonly at intervals on successive generations and then with extreme severity.

In 1858, Darwin had written this in his draft of a book not published until 1987

Charles Darwin begins the first edition of *The origin of species* thus:

When on board H.M.S. ‘Beagle,’ as naturalist, I was much struck with certain facts in the distribution of the inhabitants of South America, and in the geological relations of the present to the past inhabitants of that continent. These facts seemed to me to throw some light on the origin of species—that mystery of mysteries, as it has been called by one of our greatest philosophers. On my return home, it occurred to me, in 1837, that something might perhaps be made out on this question by patiently accumulating and reflecting on all sorts of facts which could possibly have any bearing on it. After five years’ work I allowed myself to speculate on the subject, and drew up some short notes;

the equipment in unconventional ways to mimic typical physical activity in the Palaeolithic. At our December workshop on Evolutionary Fitness, Keith entertained us by wrestling sandbags of various weights (a substitute for a bear?), by hoisting heavy weights (carrying the prey home?), making sure that exercises were done for both sides of the body. Carry the kangaroo on your left side, swap it to the right, etc, to maintain strength and flexibility on both sides.

Keith had suggested that I should end the evening with a demonstration of Scottish Country Dancing, but one person cannot demonstrate social dancing. In the situation I realised there was no point in spending half an hour trying to teach even the simplest SC dance. So we concluded the evening with just a few minutes of music and movement. Just getting up and moving to music makes people smile and interact, and it certainly did at our meeting.

In Stephen Boyden’s list of postulated intangible health needs of the human species he includes the experience of conviviality, co-operative small group interaction, and active involvement in recreational activities such as music and dancing. Different people will find a different activity or a range of activities to fulfil these needs.

For me, the answer has been Scottish country dancing. It provides physical activity to music in a social setting. It also demands a high level of mental

these I enlarged in 1844 into a sketch of the conclusions, which then seemed to me probable: from that period to the present day I have steadily pursued the same object....

My work is now nearly finished; but as it will take me two or three more years to complete it, and as my health is far from strong, I have been urged to publish this Abstract. I have more especially been induced to do this, as Mr. Wallace, who is now studying the natural history of the Malay archipelago, has arrived at almost exactly the same general conclusions that I have on the origin of species. Last year he sent to me a memoir on this subject, ...

Evolutionary fitness, continued

concentration to follow the intricate patterns of the dances. Surprisingly, it is often taken up by people like me who feel incompetent on the dance floor, who 'have two left feet'. It has enabled me to experience the joy and elation in physical movement mentioned in Forencich's *Play as if your life depends on it* (reviewed by Keith in the Dec-Jan journal).

This brings me to another point. Although I thoroughly agree with Keith and Stephen that the evolutionary health principle is our best guide to acquiring and keeping good health, we must remember that indeed there have been some small evolutionary changes in humanity since the stone ages. One of the most notable is the ability of adult Northern Europeans to metabolise lactose, something other adult humans and mammals generally cannot do. Civilisation has also enabled a large number of deleterious genes to survive in our populations, partly because we protect the weak from predators and accidents, and now also because medical science has the capacity to keep people with these genes alive, and even helps them to reproduce.

Because of this care, a far greater proportion of people survive to old age than they used to. As zoo keepers are finding out, old animals need different care, and different food from younger animals. In the wild old animals rarely exist: they have fallen prey to physical injuries and predators. As the native residents of Canada knew, the wolf kept the caribou healthy, by culling the weak, the sick, the injured and old. The caribou likewise kept the wolf healthy, by providing food (and exercise).

So while the evolutionary health principle provides an excellent guide for good health, indeed the essential

guide at any age or in any condition, we must remember that nature makes no guarantee about good health in old age. There is some evidence of debilitating diseases such as arthritis occurring in both dinosaur and early human bones. Bodies must wear out, if they are not culled by predators.

For anyone interested in evolutionary fitness, Keith has prepared three papers covering diet and exercise. These are available from him through the NSF office.

Jenny Wanless

Meeting report

Climate change, 21 January 2009
Walter Jehne

Rather than a report of the meeting (which can be found on our website), we present here notes from Walter. They cover material which he did not get around to at our meeting. A copy of Walter's full document will be published on our website.

Evolutionary biology suggests that much of our behaviour is instinctive or learned during our formative years. The implication is that parents and other role models need to provide children with clear values and guidelines for behaviour. If we fail to teach children the values of a compassionate, sustainable, peaceful global community then, in their confusion, they will turn to other sources of values available in modern society. These sources include television, with its diet of violence, greed, self-interest and exploitation. They include the messages of the Far Right, fundamentalist religions, cult leaders and the growing masses of gambling operatives who exploit the vulnerable.
John Ward, The Ethics of Peace, NSF Occasional Paper No.5, 1997

We can address the climate crises only by understanding the science underpinning its cause and solution. If we do, it is inescapable that, due to the past 25 years of political denial and delay:

1. Since 1750 (not 1975) we have so impaired the earth's natural bio-sequestration capacity due to deforestation that it can not fix enough CO₂ to maintain former balances.
2. We have since emitted so much additional CO₂ from the combustion of fossil fuels that CO₂e levels will now inevitably rise to above 500 ppm by 2020-30.

Darwin's *Origin* is the high point of [evolutionary] literature in fact. Darwin wrote well because he read well. In a single summer, his diary records, he enjoyed *Hamlet*, *Othello*, *Mansfield Park*, *Sense and Sensibility*, Boswell's *Tour of the Hebrides*, the *Arabian Nights* and *Robinson Crusoe*. His own prose is like a Victorian country house. It radiates

confidence from whatever direction it is viewed, as literature, as autobiography or as brilliant science.

Steve Jones in *Almost like a whale* (1999), his rewrite of *The origin of species* drawing on information and knowledge that has become available in the 140 years since its publication.

3. This inescapable increase in CO₂ levels will inevitably increase mean global temperatures by some 4-5°C by 2030 via its greenhouse warming effects.
4. This mean global temperature increase will inevitably further accelerate up to twenty dangerous climate feedback processes that will collapse many of our bio-systems.
5. No level of future CO₂ emission reductions or targets can now avoid CO₂ levels and global temperatures rising, nor prevent the resultant dangerous feedback processes from inducing climatic and bio-system crises by 2030.

It is too late for any CO₂ emission reduction to be effective. Similarly, due to the long residence time of CO₂ in the atmosphere and the ocean lag effect, the removal of CO₂ from the atmosphere to reduce levels to 350 ppm, even if practical, could not now prevent this CO₂ increase, its resultant warming effect or its dangerous positive feedback effects and their consequences.

Based on this we have no option but to:

1. Urgently **cool** regional and global climates to offset the CO₂-induced warming.
2. Avoid temperatures rising above the 2°C needed to trigger dangerous feedbacks.
3. Prevent the widespread collapse of the bio-systems on which human life depends.

Fortunately we may be able to cool regional and global climates through restoring the safe natural hydrological processes that have governed over 90% of the earth's heat dynamics and balance for the past four billion years.

In any attempt to analyse the causes of human violence, it is vital to realise that much of modern human behaviour reflects our evolutionary history. We now know that human violence is not an aberrant behaviour but a manifestation of our nature that has evolved over the last four million years. Chimpanzees, our closest species, demonstrate the same intraspecies violence, with death as a goal rather than an unfortunate consequence as it seems to be in other less closely related species. Chimpanzee violence towards neighbouring groups is different from that of other primates in that the aim is to kill, whereas other primates are content to see the other group flee. It is clearly not a coincidence that humans and chimpanzees seem to be the only two species who fight to kill.

John Ward, The Ethics of Peace, NSF Occasional Paper No. 5, 1997

Collectively these processes have the capacity to safely and rapidly moderate regional heat balances by up to 200 watts per square metre (w/m²), and more than offset the 1.6 w/m² mean global warming attributed to the human induced CO₂ greenhouse effect to date.

Details of the science and safe management of these regional and global cooling options have been outlined previously in this journal (December 2006) and include practical options to achieve the necessary cooling and associated rainfall restoration. For example, to cool regions and offset the 1.6w/m² CO₂ based warming we need to rapidly:

1. Establish restoration shelterwoods to shade and cool land surfaces by up to 20°C.
2. Enhance the cooling of the land surface by the transfer of latent heat to the upper troposphere as evaporated water.
3. Insulate land surfaces with vegetation to reduce heat absorption and infra red re-radiation.
4. Reduce dust and aerosols so as to limit the micro-nuclei for humid haze formation (humid hazes are the primary particles by which solar and infra red radiation is absorbed by the lower atmosphere to contribute to the observed warming and aridification).
5. Enhance the level of dense clouds with high reflective albedos by increasing the the production of biological precipitation nuclei able to coalesce the humid hazes, through targeted reforestation.
6. Using all the above, enhance rainfalls to remove the warming humid hazes and increase plant

Darwin - "Multiply, vary, let the strongest live and the weakest die." is Darwin's ten word synopsis of the theory of natural selection, quoted in Robert Wright's *The moral animal*. In Wright's fine discussion of current theories of evolutionary psychology, he cautions that "here strongest, as [Darwin] well knew, means not just brawniest, but

best adapted to the environment, whether through camouflage, cleverness, or anything else that aids survival and reproduction. ... The word fittest," Wright warns, "is typically used in place of strongest, signifying this broader conception — an organism's fitness to the task of transmitting its genes to the next generation, within its particular environment."

Walter Jehne on climate change - continued

growth, shelter and latent heat transfers from the earth's surface.

7. Using all the above re-establish the night time radiation windows that previously enabled much of the day time solar heat to be re-radiated as infra red radiation back out to space but are now blocked by the persistent hazes of water micro-droplets.
8. Induce combinations of these processes by strategic plantings and shelterwood restoration to safely provide up to a 100 w/m² local cooling assumed to be due to greenhouse warming.

Similarly, to reinforce the natural resilience of bio-systems to climate stress we can:

1. Establish restoration shelterwoods to decrease water losses from desiccation. This will require the use of simple, yet available technologies to ensure the survival and successful establishment of seedlings.
2. Enhance soil organic matter and structures so as to enhance their infiltration, retention and capacity to supply water to plants over extended dryer periods.
3. Restore natural riparian vegetation and processes for retaining and spreading flood flows to recharge valley sediments for use during dryer periods.
4. Encourage the growth and predominance of perennial deep-rooted plants over the landscape to enhance soil structures and the sustained water availabilities.
5. Encourage the protection of surface soils by vegetation to avoid desiccation, insulate soil surfaces, reduce dust erosion and humid hazes

I believe that there may be biological reasons for our inability to translate our knowledge of our predicament into sensible behavioural change. I have argued that our position on the evolutionary tree is not as we have come to believe it to be. We perceive humanity as a highly evolved species with a highly developed cognitive capacity. The real position, however, is that our primitive brains, the seat of our emotions such as fear and hate which have provided survival value throughout evolution, continue to influence our behaviour, often overcoming rational decisions. The relative sizes of the limbic system (the source of the emotions) and the neocortex are the same for apes, monkeys and humans. No differences in cellular architecture or neural connections have been observed between humans, Old World monkeys and apes.

John Ward, The Ethics of Peace, NSF Occasional Paper No.5, 1997

and the heating and re-radiation of infra red from the earth's surface which drives the greenhouse effect.

6. Restore the natural solubilisation and cycling of nutrients by soil fungi to aid plant growth through higher *in situ* landscape-scale bio-degradation and cycling which will also reduce bushfire risk.
7. Restore and enhance the continued natural capture and re-condensation of up to 50% of the transpired water within the canopy to retain moisture for that bio-system.
8. Restore and enhance the production of the microbial precipitation nuclei by bio-systems responsible for coalescing and removing the increase in warming humid hazes and re-establishing the historic cooling rainfalls and growth potential.

To secure critical water supplies for ecological, rural and urban use we can:

1. Establish restoration shelterwoods to decrease the current desiccation and loss of most of the 452 mm of mean rainfall by 2500 mm of mean potential evaporation.
2. Enhance the natural within-canopy harvesting and cycling of dew water by plants to extend moisture supplies and plant growth per unit of original rainfall.
3. Enhance the carbon content and thus structure, natural infiltration, retention and availability of water in our in-soil reservoirs. As soils naturally receive and potentially store 98% of our rainfall relative to the 2% that can be stored in man-made structures, this in-soil storage potential is critical to our water security.

Darwin - Modern humanism is the faith that through science humankind can know the truth – and so be free. But if Darwin's theory of natural selection is true this is impossible. The human mind serves

evolutionary success, not truth. To think otherwise is to resurrect the pre-Darwinian error that humans are different from all other animals.

John Gray in *Straw dogs*, 2002

4. Enhance the development of deep-rooted perennial plant systems able to grow and survive with minimal irrigation inputs due to their access to deep soil water.
5. Restore the capacity of riparian systems including their micro-topography and ecologies to retain and spread flood waters for sustained use in subsequent dryer periods without the need for irrigation.
6. Enhance the continued safe treatment and re-use of urban and industrial water via local autonomous water systems to provide virtually endless safe recycled water.
7. Harvest some of the 13,000 km³ of water that flows naturally, often over dry land, as humid air and humid hazes but can not precipitate until it has been coalesced by hygroscopic precipitation nuclei to be able to fall as rain.
8. Restore former natural rainfall systems such as the Australian Monsoon through the wise use of traditional and scientific knowledge of these rainfall dynamics.

In the end, we will conserve only what we love. We will love only what we understand. And we will understand only what we are taught.

Baba Dioum, African ecologist

Although these cooling and resilience enhancement options are urgent and essential to prevent further accelerating the dangerous climate feedbacks and the collapse of biosystems, they are an interim triage response

They do not remove the need to restore the forests and their associated carbon bio-sequestration and hydrological heat balances that have governed and buffered the climate for aeons. However, it is now too late to rely solely on CO₂ emission reductions to prevent dangerous climate change and bio-system collapse without also embracing these safe, natural and effective cooling options.

Walter Jehne



Darwin - The appearance of dejection in young orangs and chimpanzees, when out of health, is as plain and almost pathetic as in the case of our own children. This state of mind and body is shown by

Some rambling thoughts following Walter Jehne's talk

Walter's talk on Wednesday stirred up some lively discussion.

While there were some quite strong differences of opinion, nobody challenged the point with which Walter started his presentation. Everyone agreed about the extreme seriousness of human-induced climate change and the urgent need for immediate action on a massive scale. It is very worrying that the leading politicians in the two major political parties in our country today have no conception of this reality.

I would like to say at the outset that I am interested in Walter's ideas and I am especially supportive of his work on restoring the biological integrity of soils.

While the technical details of his arguments are beyond my grasp, it seems to me that his view that deforestation has been a major contributing factor contributing to the enhanced greenhouse effect needs to be taken seriously, as do his ideas

on how forests influence local water dynamics and the role of nucleating particles from trees in bringing about rainfall.

However, Walter has simply not convinced me that the reduction of carbon dioxide emissions is relatively unimportant. On this point I find myself in agreement with Andrew Glikson who commented at some length during the meeting.

Going back to basics

As I wrote in a previous response in this Journal to a talk by Walter, there seems to be no disagreement among climate scientists about the following facts:

- 1 The average temperature on this planet would be 34 °C colder than it is were it not for the 'natural' greenhouse effect (i.e. the situation before humans began burning fossil fuels with the industrial revolution).
- 2 Part of this natural greenhouse effect is due to carbon dioxide in the atmosphere. Estimates of the contribution of this gas to the total effect range from 9 to 26 per cent. For the purposes of

their listless movements, fallen countenances, dull eyes, and changed complexion.

Darwin, *The expression of the emotions in man and animals*, 1872

this discussion let us take the CSIRO figure of **15 per cent** which I believe to be reasonable.

- 3 This is to say that 'natural' carbon dioxide is responsible for about **5°C** of the 34 °C
- 4 As a consequence of human activities the concentration has increased from the preindustrial level of 271 parts per million to 385 parts per million. It will not be long before the concentration is **double** the preindustrial level.

All this being so, if we double the CO₂ concentration we can surely anticipate a substantial increase in global temperature – although perhaps not precisely another 5°C because of the complexity of the situation and a range of feed-back processes.

Looking back at Wednesday's discussion, it seems to me that there is urgent need for action on three fronts:

1 Reducing carbon emissions.

Given the above facts, it is surely absolutely crazy to continue to pour massive amounts of carbon dioxide into the atmosphere. The present rate is about 29 billion tonnes per year – or 8 billion tonnes of carbon.

I think IPCC is right to put emphasis on reducing carbon dioxide emissions. Walter describes the IPCC interpretation and recommendations as simplistic – but I believe we ignore them at our peril.

I agree with Barney Foran when, in his recent public lecture 'A low carbon economy based on renewable energy - the only way to go' at the Academy of Science, he called for 'a massive shift to renewables'.

Of course there are those, including some prominent scientists, who advocate replacing fossil fuels with nuclear power. It is indeed a dismal situation if we humans have become so addicted to high levels of extrasomatic energy use that we are forced to

Darwin - We no longer have to resort to superstition when faced with the deep problems: Is there meaning to life? What are we for? What is man? ... "The point I want to make is that all attempts to

replace one polluting source of energy with another polluting source – and one that undoubtedly holds extremely high risks for humankind.

A significant decrease in carbon emissions can also be achieved by reducing our *per capita* use of energy, which is now twice what it was some 40 years ago and still increasing steadily. This will require big changes in the economic system and in the structure of the work force – so that human needs can be satisfied without ever-increasing consumption of material goods and energy.

Politicians tell us that what matters most is 'jobs, jobs, jobs' (Turnbull) and they exhort us to 'spend, spend, spend' (Rudd). Are jobs really more important than the life-support systems that underpin our very existence and that of our children and grand children?

Look again at that dot. That's here. That's home. That's us. On it everyone you love, everyone you know, everyone you ever heard of, every human being who ever was, lived out their lives. Our posturing, our imagined self-importance, the delusion that we have some privileged position in the universe, are challenged by this point of light. Our planet is a lonely speck in the great enveloping cosmic dark. In our obscurity, in all this vastness, there is no hint that help will come from elsewhere to save us from ourselves.

Carl Sagan, 1996, on looking at the picture of Earth taken by Voyager 1 from six billion kilometres out in space

The challenge for government is not to safeguard or create eco-destructive jobs – but rather to develop strategies for providing alternative employment for members of the work force whose present occupations are inconsistent with the goal of ecological health and sustainability.

The current global economic 'crisis' should be seen as a golden opportunity to begin the transition to a new kind of society in which human welfare does not depend on ever increasing *per capita* consumption of material goods

and energy.

2 Cessation of deforestation and widespread afforestation and reforestation.

Recognising that big reductions in CO₂ emissions will not alone be sufficient to prevent dangerous climate change, what are the chances of removing some of this gas from the atmosphere?

Bryan Furnass reminded us at the meeting that photosynthesis is the natural and very effective means of removing carbon dioxide from the

answer that question before 1859 are worthless and that we are better off if we ignore them completely".

Richard Dawkins in *The selfish gene* quoting G G Dawson

atmosphere. The deforestation that is still proceeding apace in Australia as well as in many other regions of the world is ecologically insane.

As I read the situation, both Walter's and the IPCC's interpretation of climate change call for immediate and widespread reforestation, afforestation and bio-enrichment of soil.

Of course an interfering factor is the need for land to produce food for still growing human populations. According to Dawson and Spannagle, the maximum potential for bioquestration from afforestation and reforestation globally is about 17 billion tonnes of CO₂ per year (4.7 billion tonnes of carbon) – enough, they say, to offset about one third of all anthropogenic greenhouse gas emissions at current rates (I make it just over half the current CO₂ emissions). But these authors then write: 'Unfortunately, for various reasons, nothing like this

level of bioquestration is likely to be achieved'. (B. Dawson and M. Spannagle – *The complete guide to climate change*. p.50).

I understand that CSIRO is at present engaged in a project on the potential role of forests in mitigating greenhouse gas emissions.

I note that, in his submission to the Garnaut Climate Change Review, Walter Jehne suggests that, given sufficient rainfall, partial reforestation of the 500 million Ha of inland and northern Australia could sequester 2 billion tonnes of carbon per annum (at the rate of 10 tonnes per hectare per annum). This would be 25 per cent of the current global emissions!

It is possible that other approaches to biosequestration (e.g. involving algae) could also make a significant contribution.

3 Preparing for climate change

The view was expressed at the meeting that it is useless to talk about preventing climate change – it

is too late. We must put all our effort into working out ways of adapting to climate change.

Certainly it is too late to prevent some serious climate change, and it is indeed imperative that strategies are in place for coping with the worst. But surely for the sake of future generations we should make every effort to curb the practices that are causing climate change and to sequester atmospheric carbon as rapidly and effectively as possible.

So, in sum – we must: (1) drastically reduce our greenhouse gas emissions, (2) immediately put immense effort into reforestation and afforestation and soil improvement, and (3) plan for climate change.

I will not comment on the various proposals for different geo-engineering measures for mitigating climate change, some of which were mentioned at

the meeting. This is partly because I don't properly understand them – and partly because they are antidotal rather than corrective and therefore quite likely to have undesirable side effects. However, it may well be that society will be forced to take such measures.

Australia's role

Finally, several people drew attention to the obvious fact that this is a global problem – not just an Australian one, and that anyway Australia is responsible for only about 1.4 percent of global emissions of carbon dioxide.

But these facts should not be interpreted to mean that we have

no part to play and that we need take no action. On the contrary, for several reasons our country is in a favoured position to play a leading role internationally in the shift to ecological sustainability – by showing the world how it can be done. It is noteworthy that this viewpoint is never expressed in the political arena.

Continued p 13, top of column 2

Darwin - Nature is prodigal of time, and can act on thousands of thousands generations: she is prodigal of the forms of life, if the right variation does not occur under changing conditions so as to be

selected and profit any one being, that form will be utterly exterminated as myriads have been.

Written by Darwin in 1858 in a larger book for which *The origin of species* was to be the abstract. The larger book was not published till 1987.

ISES/ANZSES conference 2008

The 46th Australian and New Zealand Solar Energy Society (ANZSES) Annual Conference was held in conjunction with the 3rd International Solar Energy Society (ISES) Conference, Asia Pacific Region, late last year. I attended for one day.

As many NSF members are already aware, ANZSES, 'The Australian and New Zealand Solar Energy Society is a non-profit organization of renewable energy professionals and supporters that promotes energy sourced from the sun. This is interpreted broadly to encompass all true renewable energy technologies. In promoting renewable energy technology, the society is committed to solutions that are truly ecologically sustainable and not simply opportunistic'.

The majority of the presentations I attended were focussed on renewable energies and the latest developments. A not insignificant number of the speakers had been or were still researchers.

Sessions at the conference included:

- Photovoltaics
- Solar thermal
- Wind
- Biomass
- Emerging renewable energies
- Energy efficiency
- Developing countries
- Grid connection and integration
- Sustainable buildings and design
- Policy issues including local government initiatives, financial risks and opportunities in the renewable energy sector.

We associate truth with convenience, with what most closely accords with self-interest and personal well-being or promises best to avoid awkward effort or unwelcome dislocation of life. We also find highly acceptable what contributes most to self-esteem. Economic and social behaviour are complex and to comprehend their character is mentally tiring. Therefore we adhere, as though to a raft, to those ideas which represent our understanding.

*John Kenneth Galbraith
The Affluent Society*

Some points noted included:

- Progress is being made rapidly in a variety of areas e.g. a solar thermal plant being completed in a few months in California, with solar thermal steam production now being competitive with fossil fuel production (including natural gas) and the storage systems allowing base load supply progressing well.
- It seems the ACT feed-in tariff could accept large-scale projects.
- Reducing embodied ("grey") energy in houses with the use of prefabricated sections. Some new buildings and urban planning in Dubai and Abu Dhabi are reducing energy and water use!
- Feed-in tariffs in various countries often have very different characteristics.
- 'Accelerated depreciation' may be superior to feed-in tariffs in some circumstances.
- 2.4 billion humans could reduce their use of wood using relatively inexpensive solar steam cookers.
- Rich communities have much to learn about sustainability from poor communities around the world.
- Gas should be considered a scarce resource.
- A government minister with responsibilities in the area emphasised that we need a comprehensive response to climate change including encouraging a 'green collar' economy.

Darwin's methodology - Darwin began thinking and writing about the theory of evolution by natural selection years before he published *The origin of species*. Although he had stumbled upon an idea that would forever change biology and the life sciences, he did not have sufficient evidence to support his iconoclastic views. He needed some provisional evidence for his grand theory.

Testing the theory of evolution by natural selection was no small task, so Darwin used several different methods for this purpose. For example, Darwin spoke with animal breeders to learn about artificial selection. He eventually discerned that heritable

variation in domesticated traits was shaped by the preferences of breeders and likened this process to the natural selection of traits. He also surveyed the existing scientific literature on species in their natural environments, describing and cataloguing the vast amount of variation that existed within and between species. Additionally, he spent many hours experimenting with seeds to determine whether they germinated after being exposed to various conditions. Armed with information from his observations, field studies and experiments, Darwin was able to provide initial support for the basic

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- The premiere screening of the film *'The future makers'* emphasised the contribution of Australians "leading the way on the world stage in renewable energy".

ANZSES has a solid membership base and new members are always welcome. Please see the website at: <http://www.anzsos.org/>

A comment: Most of us appreciate that technology alone cannot 'solve' our global climatic dilemma, and, as was recently demonstrated at a NSF talk, there are clear disagreements on what, and how quickly, the "right" things are that should be done. It may seem naïve to ask that we all attempt to find some agreement to allow real progress... After all, can we afford to wait until everyone agrees?

The presentations I attended indicated to me that there are many intelligent, motivated people attempting to develop useful technologies as quickly as possible. It is all too often the prerogative of those in positions of influence to support ideas that are blatantly unrealistic with a time scale that precludes any genuine hope of producing solutions. When one sees the snail's pace of larger scale responses to global environmental menace, will we be confronted in the not too distant future with a global scale technological choice which could bring respite or simply severely compromise the very existence of many species, including ours.

Gilles Rohan

Stephen Boyden's response to Walter Jehne's talk - continued from page 11

This would, of course, be to our advantage in the long term, because it would hasten necessary change across the globe – to the advantage of all of humankind, including Australians.

However, at this moment the most pressing need is surely to educate our politicians and to convince them of the overriding importance and extreme urgency of the climate change issue. We have to admire Andrew Glikson for his tireless efforts in this regard.

Stephen Boyden



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premises underlying the theory of evolution by natural selection. Indeed it was Darwin's relentless perseverance gathering data from multiple sources that permitted his theory ultimately to be embraced by the wider scientific community.

Simpson and Campbell, *Methods of evolutionary sciences*, 2005

Darwin considered that his own success was chiefly due to "the love of science, unbounded patience in long reflecting over any subject, industry in observing and collecting facts, and a fair share of invention as

well as of common sense". He also says: "I have steadily endeavoured to keep my mind free so as to give up any hypothesis, however much beloved (and I cannot resist forming one on every subject), as soon as facts are shown to be opposed to it". The essential causes of his success are to be found in this latter sentence, the creative genius ever inspired by existing knowledge to build, hypotheses by whose aid further knowledge could be won, the calm unbiased mind, the transparent honesty and love of truth which enabled him to abandon or to modify his own creations when they ceased to be supported by observation.

From the archives of the UNESCO Australian Capital Territory biosphere reserve

Skye Hope's story - Written and published in 2035

A work of fiction written in 2008

Skye Hope was born in Canberra, the National Capital of Australia, in 2010. His parents told him when he was growing up that they called him Skye for several reasons. One was the proud acknowledgment of some Scottish heritage in his parents' past. Another was the reference among the sayings of the ancient Chinese teacher and sage, Confucius, to Sky as some kind of ethereal power overseeing the process of development of Manhood-at-its best. A third was the sky as a symbol of the natural world. His parents also said they called his sister, two years younger than him, Arbor (the Latin word for tree) in honour of trees and their importance for the environment.

Skye's parents died five years ago in an accident on the coast when they were caught in an extreme weather event, a deep cyclonic depression that produced huge waves and overturned their boat.

Their parents left Skye and Arbor their rural block close to Canberra in their will. They had called it "Kangaroo Cottage". Recently, Skye was sitting on the front porch of the cottage. Arbor was below him, inspecting the Australian "bush tucker" plants in the food orchard there, originally established by their parents. The kurrajongs had produced well in 2035 and they both knew they needed to gather the fallen seeds soon and crush them in preparation for cooking and eating. Some edible Australian wattle seed were also almost ready for collecting for food. As far as possible Skye and Arbor grew tree crops in

their orchard. The trees did not need cultivation and required little if any irrigation. The tubers of planted yam daisies, Murnong, once a staple food of Aboriginal people in Southeastern Australia, were also ready for harvesting. They too had yielded well without any irrigation despite a relatively dry season.

It had been the overriding aim of Skye and Arbor's generation of people to re-establish respect and care for the natural world and cease any unsustainable exploitation. In hindsight it had been foolish to allow greed to dominate human development to such an extent that the industrial revolution increasingly wrought immense and unsustainable damage on the natural systems on which we all depend for our survival. We were duped into becoming extreme consumers in a society which pandered to our wants rather than our needs.

A world that offers no future, but shows no signs of admitting this fact, imperils its own future along with the life, health and freedom of all beings on the planet. Civilisation's rulers have always squandered whatever remote chances they had to prepare for the end of life as they knew it, by choosing to ride the crest of domination, in all its forms.

John Zerzan, Twilight of the Machines (2008) p 114

Skye had learned that even before he was born in 2010, concern was mounting about the sustainability of the current lifestyle in Western countries. There was acknowledgement even from the heads of the global petroleum industry at that time, that oil supplies were finite and about to peak or may even have peaked, just when newly emerging industrializing nations such as China and India were putting even more unsustainable

demands on oil supplies. There was convincing evidence at the same time that the earth's climate was already being irreversibly changed in extremely damaging ways by increasing pollution. All this was occurring against a background of proliferating weapons of mass destruction. The future looked grim indeed and perhaps short term for the human species and much of life on earth.

Yet Skye and Arbor have survived until 2035 and had a fulfilling life so far. They have lots to look forward to in the future. How did this happen?

Darwin - And here's the final paragraph of *The origin of species* (first edition)

It is interesting to contemplate an entangled bank, clothed with many plants of many kinds, with birds singing on the bushes, with various insects flitting about, and with worms crawling through the damp earth, and to reflect that these elaborately constructed forms, so different from each other, and

dependent on each other in so complex a manner, have all been produced by laws acting around us. These laws, taken in the largest sense, being Growth with Reproduction; Inheritance which is almost implied by reproduction; Variability from the indirect and direct action of the external conditions of life, and from use and disuse; a Ratio of Increase

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The Australian Capital Territory, which includes the national capital, Canberra, became a UNESCO biosphere reserve in 2010. It joined more than 500 other biospheres reserves around the globe, all devoted to promoting ecologically sustainable development. These biosphere reserves became increasingly active nodes for promoting such development and monitoring and ameliorating the influence of climate change around the world.

Skye remembered from his history studies that a rejuvenated United Nations had gradually taken more of a world government role through the decade 2010-2020. The people of the world had recognized that the threat to their survival posed by human-induced climate change was global and required a solution at the global level. The ambitions of individual nations had to be subsumed within the global approach required to reduce such climate change. People everywhere around the globe insisted on working together for the common survival of all. Those who did not received little sympathy.

The UN was changed to UPANO (United People and Nations Organisation). The General Assembly remained similar in structure to the old UN General Assembly, consisting of government representatives of all Member States. The new Security Council however had no permanent Member States, based on the premise that all citizens of the world are created equal and therefore those in one nation should have no more influence on world affairs than those in another. Half of its membership of 20 consisted of representatives of elected States. The other half consisted of the world's citizen representatives, 10 eminent global citizens who had made outstanding contributions to fields such as world peace, sustainable development, science for the good of humanity, preservation of the environment, medicine, humanitarian assistance or philanthropy. They were appointed for a maximum of two three year terms and elected by the people of

Modernity is always trying to go beyond itself to a different state, lurching forward as if to recover the equilibrium lost long ago. It is bent on changing the future – even its own – because it always destroys the present. More modernity is needed to heal the wounds modernity inflicts!

John Zerzan, Twilight of the Machines (2008) p 119

the world every three years, voting electronically in support of their preferred 10 candidates, with each Member State eligible to nominate one eminent citizen per election, stating qualifications. Details of all candidates were available on global television and the internet well before the election. The citizen's group is the equivalent of a jury in a legal system. The power to directly elect representatives gave citizens of the world a greater sense of ownership in the activities of UPANO than had been the case with the United Nations. Australia, during its term on the Security Council after 2012, was influential in bringing about these changes in the structure and name of the United Nations.

One other result of this increased cooperation among the world's citizens was that the nations agreed to pass control of all weapons of mass destruction over to the amended United Nations.

As Skye and Arbor were growing up they were educated more and more from home using electronic equipment. Schools still existed though, as much for social interaction as for learning.

Use of solar energy to provide an increasing proportion of the earth's energy needs had continued to grow. The breakthrough in which solar receptive material could be

painted on metal roofs of buildings led to a significant increase in collection of solar energy. Ways were also found to exploit differences in sea temperature at different depths and use the currents produced by these temperature differences to drive large turbines, producing more electricity.

There had been a resurgence in public transport while Skye and Arbor were growing up, especially that powered by electricity. Electric trains of various kinds became much more common. Private motor vehicles changed significantly. Cars driven by hydrogen power became more common. Bicycles

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so high as to lead to a Struggle for Life, and as a consequence to Natural Selection, entailing Divergence of Character and the Extinction of less-improved forms. Thus, from the war of nature, from famine and death, the most exalted object which we are capable of conceiving, namely, the production of

the higher animals, directly follows. There is grandeur in this view of life, with its several powers, having been originally breathed into a few forms or into one; and that, whilst this planet has gone cycling on according to the fixed law of gravity, from so simple a beginning endless forms most beautiful and most wonderful have been, and are being, evolved.

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continued to develop, increasingly using auxiliary electric power as electric storage in batteries improved and they became lighter.

Changes occurred in the ACT biosphere reserve in food production. There was a significant shift away from animal products towards more vegetarian diets which used land more efficiently, produced fewer greenhouse gases and used less water. More food was grown locally, on house blocks and commercially. Sometimes food was grown on city roofs. Hydroponic production of vegetables increased dramatically, saving significant amounts of water. Organic farming and gardening also continued to increase in popularity.

Out in the bushland of the ACT biosphere reserve and surrounding areas, much had been done to retain the flora and fauna of the region. Reserves had been set aside and volunteers played a key role in looking after them. The lower Cotter catchment had returned to good quality bushland after the bushfires in 2003, as a result of the efforts of Greening Australia and the volunteers who helped plant back the native vegetation in the years immediately before Skye was born.

The ACT biosphere reserve promoted international exchanges of information and personnel with other biosphere reserves in Australia and overseas, to promote ecologically sustainable development at a global scale. For example the exchange of climate data among different biosphere reserves was most valuable in enabling the ACT to continue to function sustainably within the limits of existing natural resources.

Water continued to remain a problem for Canberra, an inland city, as rainfall became more erratic and

decreased somewhat due to increasing climate change. The enlarged Cotter Dam and the weir across the Murrumbidgee River at Angle Crossing near Canberra, built around the time Skye was born, significantly added to Canberra's water storage capacity. Measures taken later to reduce the rate of evaporation of stored water also helped.

Perhaps the most significant change of all as Skye and Arbor were growing up was to note the shift in society values in the ACT and elsewhere as the threats posed by climate change became more apparent. Thrift rather than extravagance became the norm. Small became beautiful. Cooperation was stressed more than competition. Manhood (and Womanhood) At It's Best in the Confucian sense became society values.

*Since Suharto, political power has been decentralised, and decision-making about natural resources has become more localised. Unfortunately, too often the result has been what one conservationist calls 'the democratisation of corruption'.
National Geographic Magazine
November 2008
Reminding us that devolution of decision-making is not always in the interests of either human equity or environmental sustainability*

Where once Skye and Arbor saw bare spaces as a child, there are now trees growing, even if they are not always the original species.

Ian Anderson

Ian is a member of the board of the Nature and Society Forum.

Tuatara

New Zealand's famous Tuatara looks like a lizard, but is in fact

the only member of the *Sphenodontia* family to survive the great extinction event that did in the dinosaurs sixty-fivemillion years ago.

After rats arrived on the main islands of New Zealand, the tuatara survived only on some of the offshore islands. Tuataras have been released in the Karori Wildlife Sanctuary (now called Zealandia), in Wellington. A tuatara nest has now been found in the sanctuary, and the hatching is eagerly awaited. It is hoped that the tuatara population will establish itself.

Australasian Science, January-February 2009

And here's the final paragraph of *The origin of species* (first edition)

It is interesting to contemplate an entangled bank, clothed with many plants of many kinds, with birds singing on the bushes, with various insects flitting about, and with worms crawling through the damp earth, and to reflect that these elaborately constructed forms, so different from each other, and

dependent on each other in so complex a manner, have all been produced by laws acting around us. These laws, taken in the largest sense, being Growth with Reproduction; Inheritance which is almost implied by reproduction; Variability from the indirect and direct action of the external conditions of life, and from use and disuse; a Ratio of Increase

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Climate change - irreversible?

Walter Jehne sent us this story shortly after his talk to us on 21 January:

Climate change is essentially irreversible, according to a sobering new scientific study reported on the US's National Public Radio late January.

As carbon dioxide emissions continue to rise, the world will experience more and more long-term environmental disruption. The damage will persist even when, and if, emissions are brought under control, says study author Susan Solomon, a scientist with the US National Oceanic and Atmospheric Administration.

"We're used to thinking about pollution problems as things that we can fix," Solomon says. "Smog, we just cut back and everything will be better later. Or haze, you know, it'll go away pretty quickly."

Turning off the carbon dioxide emissions won't stop global warming. It's essentially an irreversible change that will last for more than a thousand years," Solomon says.

This is because the oceans are currently soaking up a lot of the planet's excess heat — and a lot of the carbon dioxide put into the air. The carbon dioxide and heat will eventually start coming out of the ocean. And that will take place for many hundreds of years.

Setting acceptable limits for carbon dioxide is a judgment call. "That's really a political decision because there's more at issue than just the science. It's the issue of what the science says, plus what's feasible politically, plus what those who set economic priorities regard as reasonable economically to do,"

But despite this grim prognosis, Solomon says this is not time to declare the problem hopeless and give up.

How extremely stupid not to have thought of that!

*T H Huxley, on reading
The origin of species*

"I guess if it's irreversible, to me it seems all the more reason you might want to do something about it," she says. "Because committing to something that you can't back out of seems to me like a step that you'd want to take even more carefully than something you thought you could reverse."

Warfare and conflict resolution

Those engaged in conflict resolution analysis were persuaded, by the behaviours and responses revealed in a conflict situation, to conclude that traditional concepts of law and order, of the common good, of majority decision making, of the right to rule and to expect obedience, were probably at the root of a great deal of social conflict. Clearly this was the case in situations where there was an absence of political legitimisation. The attempt to impose

structures that denied to people their identity and their development in all aspects, and the attempt to impose the norms of the powerful, were dysfunctional and a source of conflict.

The theory of needs led logically to the development of a process that would enable parties to conflicts to ascertain the hidden data of their motivations and intentions, and to explore means by which human-societal needs held in common could be satisfied. As these needs were universal, and as they related to security, identity and other developmental requirements that are not in short supply, the process soon revealed that conflict resolution with win-win outcomes is possible.

John Burton, *History of conflict resolution*, NSF Occasional Paper No 6, 1998

Social change

There is nothing more difficult to plan, more doubtful of success, nor more dangerous to manage than the creation of a new system. For the initiator has the enmity of all who would profit by the preservation of the old system and merely lukewarm defenders in those who would gain by the new one.

Niccolo Machiavelli, *The Prince*, 1513

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so high as to lead to a Struggle for Life, and as a consequence to Natural Selection, entailing Divergence of Character and the Extinction of less-improved forms. Thus, from the war of nature, from famine and death, the most exalted object which we are capable of conceiving, namely, the production of

the higher animals, directly follows. There is grandeur in this view of life, with its several powers, having been originally breathed into a few forms or into one; and that, whilst this planet has gone cycling on according to the fixed law of gravity, from so simple a beginning endless forms most beautiful and most wonderful have been, and are being, evolved.

Farrago

War in Congo

According to an article from the *Independent*, reprinted in *The Canberra Times*, 1st November 2008, the war in Congo has little to do with tribal conflict and a lot to do with making a profit from mining. The Rwandan genocide has provided a handy cover for a mining rush. The official story is that the Rwandan government chased the Hutu killers when they fled across the border into Congo. According to a UN report, the Rwandans did not follow the Hutus after they crossed the border, instead the Rwandans diverted to the mines, and pillaged them. Other countries joined in.

Congo is the richest country in the world for gold, diamonds, cassiterite and coltan. The latter is a metallic ore, the source of tantalum, and is found mainly in Congo. Tantalum is used for the capacitors used in electronic devices such as mobile phones and laptop computers.

These resources were not stolen for African use, but to be sold to the West. The more electronic goods sold in the West, the more Congolese were slaughtered. A UN report named more than a hundred western companies involved in the trade, but Western governments did nothing about them, instead telling the UN to stop criticising the companies.

By this stage nearly five and a half million Congolese have died in this war led by 'armies of business'.

[Focus on the biophysical reality, not the cultural notions.] All the 'wondrous tools', including the ubiquitous and very toxic cell phone, are more related to eco-disastrous industrialisation in China and India, for example, than to the clean, slick pages of Wired magazine. The salvationist claims of Wired are incredible in their disconnected, infantile fantasies. Its adherents can maintain their delusions only by means of deliberate blindness not only to technology's systematic destruction of nature, but to the global human cost involved: lives filled with toxicity, drudgery and industrial accidents.

John Zerzan, Twilight of the Machines (2008) p 120

Spoiling Mountain Tops

It is common practice in the Appalachian Mountains in the USA to blast layers of rock off the top of a mountain to expose coal seams for easy mining. The Bank of America has decided to refuse loans to companies that pursue this extremely damaging form of mining. It is hoped other banks will follow suit.

This would go some way to counter the fact that a law, passed in November, allows companies to dump waste in rivers.

New Scientist, 13 December 2008

Oil Sands

Thick tarry Athabasca oil sand deposits in Canada's northern Alberta Province are considered the world's second largest oil resource after Saudi Arabia, but separating usable oil from the deposit takes three times as much energy as it would take to pump the equivalent amount of conventional oil. This makes it one of the dirtiest oil sources in the world.

The US Government has banned its agencies from buying fuel obtained from the sands. The Alberta Provincial Government is tightening its environmental oversight, and is planning to invest two billion Canadian dollars in capturing carbon dioxide emitted by the oil sands industry.

Now a report by the US Natural Resources Defense Council says that continued development of the area could kill a hundred million migratory birds over the next fifty years, mainly through destruction of habitat.

New Scientist, 6 Dec 2008

Crocodiles and cane toads

A survey on the Victoria River, in the Northern Territory, showed that in a one year period as many as 77% of the crocodiles in the area died from eating cane toads. Data from a second year also showed a high level of mortality. No species can survive such a high death rate if it continues.

The question now is whether crocodiles will learn to avoid cane toads. The two species coexist in north Queensland, but no one was around

monitoring the situation when cane toads first moved through the area, so we do not know what happened then.

Australasian Science, January-February 2009

GBS

George Bernard Shaw, considering the propensity of elderly politicians to send young men off to war, suggested that it would be a good idea to send the elderly to fight instead. He envisaged an army of old men tottering along the road, waving their walking sticks in the air, uttering imprecations against the enemy.

This would certainly reduce the intensity and duration of war!

My Turn!

Do animals other than primates have a sense of fair play? Researchers at the University of Vienna, Austria, asked 43 trained dogs to extend their paw to a human in various situations.

The dogs performed the trick at almost every request, whether they were given a reward or not, or whether they were alone or alongside another dog. The situation changed, however, when they saw another dog get a food reward but they got nothing themselves.

Dogs so slighted extended their paw on average a third less often than in all other circumstances. This may explain why some dogs show 'new baby envy' when their owners have a child.

This sense of fair play may have evolved before domestication. Wolf packs really rely on all animals pulling their weight. The research team is now testing for envy in wolves.

New Scientist, 13 December 2008

All for ourselves and nothing for other people seems, in every age of the world, to have been the vile maxim of the masters of mankind.

*Adam Smith,
The Wealth of Nations, 1776*

I'm a beekeeper

I'm a beekeeper and teach classes in bee stewardship. One thing folks can do to help, even if you aren't a beekeeper, is to make your yard bee friendly. Plant a flowering herb garden. Bees use herbs medicinally and your plants can help make a difference. I suggest borage and thyme, also rosemary, sage, marjoram, chives, basil, all the mints and other herbs with flowers. Bees will find them. To do more, plant native flowering bushes, too. In our area (Washington State) spirea and goldenrod are bee magnets. Try to have flowers in bloom through into fall. Put out a big shallow dish of water with sticks or moss in it (so they don't fall in) and keep it moist. If you can get seaweed, bees are particularly fond of the minerals so I keep a little pile of seaweed in the "bee pond." All these small actions add up and make it a little easier on your local bees.

Honey Gal at Organic Consumers' Association (US) web forum:
<http://organicconsumers.org/forum>

Off the grid

There are approximately 200,000 off-grid households in the USA. Another 30,000 grid-connected households generate at least part of their energy. In the UK there are about 40,000 off-grid homes.

For people who live off-grid, self-sufficiency means guilt-free consumption and peace of mind. The first step in living off-grid is to reduce consumption by properly insulating the building. Using an energy monitor the householder can see a live display of total energy consumption and find out just what different appliances are consuming. With a bit of effort and investment electricity consumption can be cut to a point where it is feasible to generate sufficient from renewable sources, while maintaining comfort and convenience.

New Scientist, 6 December 2008

Spinners spinning

Doubt is our product, since it is the best means of competing with the 'body of fact' that exists in the minds of the general public. It is also the means of establishing a controversy.

Tobacco industry memo, 1966

Darwin on group selection

Now if some one man in a tribe, more sagacious than the others, invented a new snare or weapon, or other means of attack or defence, the plainest self-interest, without the assistance of much reasoning power, would prompt the other members to imitate him, and all would thus profit. The habitual practice of each new art must likewise in some slight degree strengthen the intellect. If the invention were an important one, the tribe would increase in number, spread and supplant other tribes. In a tribe thus rendered more numerous there would always be a greater chance of the birth of other superior and inventive members. If such men left children to inherit their mental superiority, the chance of the birth of still more ingenious members would be somewhat better, and in a very small tribe decidedly better. Even if they left no children, the tribe would still include their blood-relations, and it has been ascertained by agriculturalists that by preserving and breeding from the family of an animal, which when slaughtered was found to be valuable, the desired character has been obtained.

Charles Darwin, *The descent of man*, proposing a model that foreshadowed many elements of modern group-selection theory.



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 25 March 2009.

Contributions may be sent on paper or electronically. This journal was prepared using Microsoft Word and PageMaker 7.0.2.

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.

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

Nature and Society Forum's major projects

ANSI: The Australian National Sustainability Initiative is endeavouring to establish a working display site in Canberra that addresses all aspects of sustainable building and lifestyle. Contact Wendy Rainbird

Biosphere Reserve Nomination: supporting the nomination of the ACT as a UNESCO Biosphere Reserve, part of UNESCO's Man and the Biosphere program. Contact Ian Anderson

Biosensitive Futures: interactive website launched this year provides authoritative information on social and environmental issues for public discussion. Also kits on the same lines for use in discussion groups. Contact Stephen Boyden. Visit www.biosensitivefutures.org

SEE-Change: community-based discussion and action groups to encourage local involvement in sustainability activities. Contact Bob Douglas

Social learning workshops for sustainability: a number of groups focusing on different aspects of local sustainability, including art and transport, youth film makers, local communities. Contact Valerie Brown

Solar Planning and Housing: extending knowledge of how to build or retrofit houses to use less water and fossil fuel energy while enhancing liveability. Contact Derek Wrigley

All contacts can be reached through the NSF office.

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