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EDITORIAL

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Editor, the Ecologist

ECOLOGIST

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Printed in the UK by MPG Impressions Tel: 020 8974 0300

SUBSCRIPTIONS/RENEWALS
www.theecologist.org; 01371 851879

DISTRIBUTION
Retail Distribution: Central Books
Tel +44 (0)20 8986 4854;
sasha@centralbooks.com
Ink Distribution
Tel +44 (0)1227 749 991;
inkdistribution@btconnect.com
Newsstand COMAG Specialist
Tel +44 (0)1895 433 800;
Fax +44 (0) 1895 433 801
North America only:
DISTICOR Newsstand Services
Tel 905-619-6565,
Fax 905-619-2903

Ecologist is published 10 times a year, monthly except January & August. International Serial Number: ISSN 0261-3131. North America: Periodicals Postage Paid at Rahway, NJ. Postmaster: Send address corrections to: *Ecologist*, c/o Mercury Airfreight International Ltd., 365 Blair Road, Avenel NJ 07001.

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Sore losers

Environmental affairs are a lot like love affairs. There's a lot of difficult territory to negotiate. A lot going on under the surface. On a nearly daily basis your emotions can range from bright, brilliant optimism to deepest, darkest despair.

So it has been with campaigner Georgina Downs' landmark High Court victory against the UK government for its fundamental failure to protect citizens from pesticide exposure. Georgina has fought for seven years to prove that exposure to pesticides via crop spraying causes health problems ranging from rashes and sore throats to cancers, asthma, reproductive damage and neurological conditions (see comment page 84).

When the ruling was announced it, along with the proposed EU ban on hazardous pesticides, made us all feel like we were finally getting somewhere. The opposition will whinge that there are no viable alternatives and its bottom line is threatened but, in the end, tighter regulation of crop spraying is a 'greater good' decision. Eventually we all win.

Barely a month went by before Defra lodged its appeal. The stated reason is that tighter regulation would make it impossible to authorise pesticides governed by the European Directive for use in the UK and this, in turn, would have a negative impact on farming and food production. But really, this is not about food, it is about finance. The government regulators, the Pesticides Safety Directorate, comprised of key officials advising Ministers on pesticides, receives around 60 per cent of its funding from the agro-chemical industry in the form of levies and fees for pesticide applications. The very structure of the PSD means it will always veer towards protecting industry instead of human health.

In launching its appeal, what we are witnessing is a government whose best defence is to cynically use people's fears of a food crisis to maintain a corrupt and harmful status quo.

Even before Defra announced its plans, Britain's National Farmers' Union was claiming that the proposed EU ban on hazardous pesticides would mean that 80 per cent of the pesticides currently in use would be banned (and if they are hazardous isn't that actually a good thing?). The pesticide industry argues that 'hazard' doesn't equate to 'risk', and that the European Parliament's environment committee members were ideologically driven and not paying attention to what the science says.

Nevertheless, the EU's latest food monitoring report showed a record level of pesticides in European foods, with almost half of all fruit, vegetables and cereals containing residues - five per cent of them at concentrations above maximum legal limits. The EU has likewise spent hundreds of thousands of pounds evaluating pesticides. Much of this data is freely available. So, when campaigners say some pesticides are causing cancer or are linked with reproductive problems, this is based on rigorous scientific analysis.

By the time you read this, assuming the agro-chemical industry does not manage to buy its way out of trouble, the EU proposals will already have been voted in. The ban will not happen overnight. It includes a grace period, which allows farmers and industry to find safer alternatives to the harmful chemicals they have been using for decades. In its insane allegiance to chemical farming, Britain lags behind nearly every other country in the EU. I suggest this time period would be most productively spent getting with the programme, rather than trying to undermine sound judicial and legislative decisions.

The NFU isn't happy. Big agriculture isn't happy. Defra isn't happy. But the time has come to admit it: our love affair with chemical farming is over.



Tighter regulation of crop spraying is a 'greater good' decision. Eventually we all win

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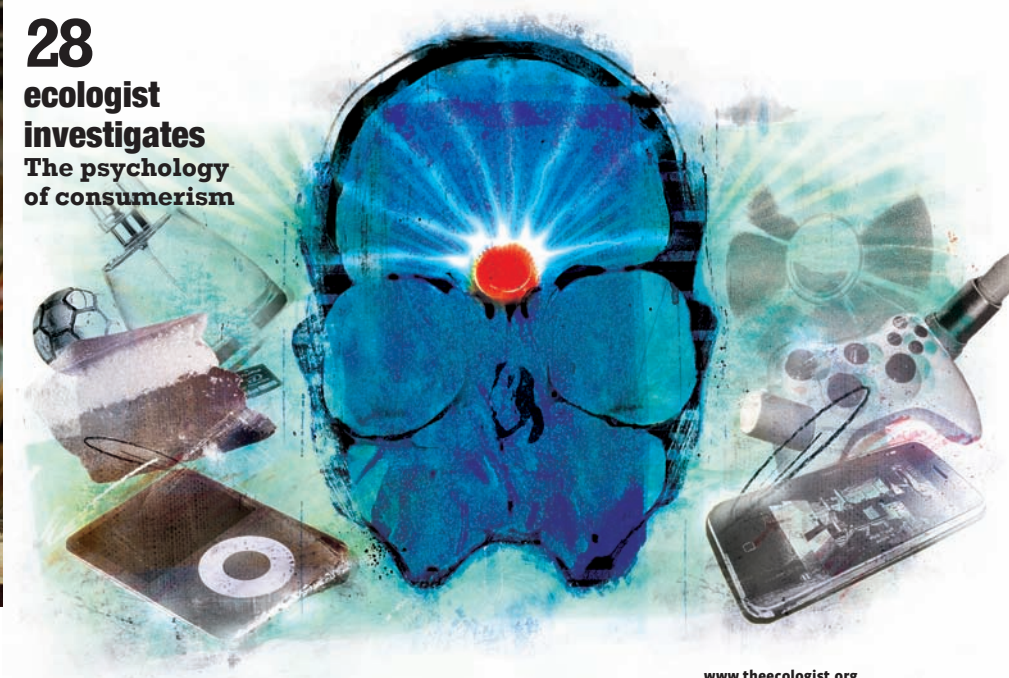
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COVER PHOTOGRAPH GETTY IMAGES



An insatiable appetite

Agricultural expansion on a massive scale in Latin America has directly paralleled the West's greed for meat. A new report follows the food chain and assesses the damage

Even if your steak was reared in the UK, there's a good chance it was fed on food grown on land that was once rainforest.

That's the take-home message of a new campaign launched by Friends of the Earth, which aims to draw attention to the connection between meat and dairy consumption in Europe and hugely destructive monoculture soya farming in South America – seen here in Mato Grosso State, Brazil.

In an accompanying report, 'What's feeding our food?', the environmental group reveals that the area of land needed to produce the soya for Europe's livestock farming industry since 1996 is roughly equal to the amount of rainforest that has been cut down in Brazil to make way for plantations since then.

Soya, which accounts for 65 per cent of all animal protein feed in Europe and 40 per cent in the UK, became the feedstock of choice after

the BSE crisis of the 1990s banned the use of abattoir wastes in feedlots.

Incentivised by arrangements made through Europe's Common Agricultural Policy, which reduced import tariffs for animal feed, and by international restrictions on European oilseed farming, soya production rocketed.

Production in Brazil alone – which supplies 78 per cent of the UK's soybeans – has increased by 170 per cent in the last 15 years.

The huge plantations – most of which are now planted with genetically modified plant varieties – have substantial impacts on climate change, employment and the health of local communities. Not only does the change in land use, from forest or savannah to farmland, release carbon dioxide, but soya plantations also reduce levels of rural employment, requiring on average only one employee per 200 hectares (494 acres).

The report also includes stories from Paraguay and Argentina of crop damage, livestock poisoning and human ill-health (everything from headaches to reproductive abnormalities) or even death from the frequent applications of agrochemicals by tractors or low-flying aircraft.

Friends of the Earth has set out an eight-point plan, calling on government, business and consumers to bring about changes to both agricultural policy and diet. In particular, the report calls for the removal of the subsidies that underpin intensive livestock farming, a switch to livestock breeds which require less protein-rich diets and an immediate review of Europe's trade strategy to take account of its substantial social and environmental impacts.

For more information, visit <http://tinyurl.com/9g7lo3>



NEWS ROUNDUP

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- How green is green tech? p9
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ON THE WEB

Some of the key environmental stories from the past month that you may have missed. Visit www.theecologist.org/news to read and follow-up...

» New report by engineering firm Atkins supports RSPB plan for tidal reef in the Severn estuary

» Californian Marine Protection Council calls for a state-wide ban on Styrofoam packaging

» World Bank is unfit to manage new global climate adaptation funds, say 142 organisations

» Oxfordshire beauty spot is finally saved from becoming a waste coal ash dump for Didcot power station

» Rural depopulation isn't just a social problem, say researchers: it affects wildlife too

» Peak coal? Government may be over-estimating global coal reserves, says US geologist

» Inflation, stagflation... ecoflation? Making goods may cost more in a warming world, warns the WRI

» Certain worms can develop resistance to pesticides in just 80 days, scientists discover

» New studies further disprove 'cosmic ray' and 'solar influence' theories of global warming

NEWSLETTER

See www.theecologist.org

» Weekly news, exclusive web articles, images, videos, podcasts and previews of content from the magazine, our weekly e-newsletter is vital reading for those who can't wait for the next edition...

PHOTOGRAPH: CORBIS

Don't mention the war

If the UK is ever going to have a sustainable food policy we have to stop looking backwards and think about the future instead

Those who see our need to grow more of our own food in the future as harking back to the Dig For Victory campaign need to buck their ideas up, say food policy experts.

'I get very pissed off when people say "oh, it'll be just like the war"', says Rosie Boycott, former editor of the *Independent* and now supporting the 'Capital Growth' project – a campaign to develop 2,012 new growing spaces in London by 2012. 'In those days we had loads of orchards, we had loads of farmers, we did grow loads of stuff. At the moment, 70 per cent of the wheat we grow goes to feed cattle which then feed us. And we have no fruit – the fact that Tesco's and Sainsbury's stock apples from New Zealand in September is a scandal, and that has to stop.'

Alan Knight, a commissioner at the Government's Sustainable Development Commission (SDC), echoed Boycott's call to drop the war mentality:

'Dig For Victory sits uncomfortably with me,' he told a seminar convened by research charity, Garden Organic. 'Dig For Victory was,



Stop 'digging for victory' and start growing food for life, say sustainability experts

"we're in a crisis, the Germans are coming – stop everything, dig up your gardens, dig up your roundabouts – we'll beat the Germans... and then it's back to business-as-usual". We're not digging for victory, we're creating a new form of lifestyle. So don't dig for victory, because when victory is over you go back to

the lifestyle you wanted to protect from the Germans.'

But despite the backlash against nostalgia, gathered experts agree that gardening has a serious and substantial role to play in contributing towards the UK's food security.

Margi Lennartsson, Policy Director at Garden Organic said that gardening was a rational response to peak oil and food shortages.

'We firmly believe that gardens should play a key part in securing the future of our food and this must be recognised by Government,' she said. 'Gardens are an undervalued and underused resource, and with over 82 per cent of the nation's households having access to a garden or green space, their potential is huge.'

Boycott said that growing your own would bring other social benefits.

'The very act of growing starts to breed within you a kind of a resilience, and a sense of your own way of surviving, instead of being in total dependence on the fact that money will always come out of the hole in the wall and that there will always be food in Tesco's, because I think the day will come when things will not be quite as clear as that,' she said.

Giving kids a damn good snacking

When is eating a packet of crisps healthier for you than eating an apple? When you're a child learning from curriculum materials provided by European Snack Association (ESA), a lobby group for the likes of Pringles, KP and Walkers.

The extraordinary claim, which is exposed in a new report by the Children's Food Campaign, is followed by a table in which the ESA compared a 30g packet of crisps with an apple, arguing that the former was nutritionally superior because it contained 'from twice to thirty times as much of all the vitamins and minerals, three times as much energy, more fibre and complex carbohydrate', whilst neglecting to mention that



crisps are often laden with salt, saturated fat and artificial flavourings. ESA has subsequently amended its web page.

The claim is just one among several made by manufacturers attempting to market unhealthy products to children. Others include warnings not to 'restrict fat intake' or 'reduce food intake to lose weight' by the UK Food and Drink Federation, and a justification by the British

Soft Drinks Association says that artificial colours – some of which have been linked to childhood hyperactivity – merely 'restore the colour lost from food during processing', and warns green-minded kids not to refill plastic bottles in case they become 'unsafe'.

In its report, 'Through the Back Door', the Children's Food

Campaign argues that such materials function as adverts within the classroom, and include 'some blatant promotion of unhealthy products and brands dressed up as impartial advice'. It says the teaching aids contain messages which could not be presented through adult media sources.

Whilst the companies behind the claims are keen to stress their altruistic motives, the PR agencies that produce the materials are less circumspect:

'Why should we (i.e. businesses) be talking to schools?' asks Magenta Project Management on its website. 'The most obvious answer is that by talking to schools you will have the opportunity to reach a captive audience of some 7.5 million young people, their teachers, school managers, governors, parents and the wider community...these people represent your current and future customers.'

The Children's Food Campaign is calling for statutory measures and sanctions on companies which flout established guidelines on using commercial materials in schools.

43 per cent of respondents in a world-wide survey of 12,000 people said they were more concerned about climate change than the state of the global economy

THINK BEYOND CO₂: HOW GREEN ARE OUR NEW ENVIRONMENTAL TECHNOLOGIES?

TECHNOLOGY	HOW GREEN IS IT?	WHAT ARE THE SHORTCOMINGS?
Wind turbines, charging battery electric vehicles	1 (greenest)	Wind doesn't blow all the time; space needed by turbines
Wind turbines, powering hydrogen fuel cell vehicles	2	As above, but water needed for hydrogen production
Concentrated solar power plants, charging battery electric vehicles	3	Needs lots of space and water, and needs to vent waste heat
Geothermal energy, charging battery electric vehicles	4	Few suitable sites. Centralised, so vulnerable to disruption
Tidal energy, charging battery electric vehicles	5	Impact on marine environment; intermittent generation
Solar photovoltaic panels, charging battery electric vehicles	6	Lots of space needed for panel; sun doesn't always shine
Wave energy, charging battery electric vehicles	7	Impact on marine environment; waves not always present
Hydro power, charging battery electric vehicles	8	Huge footprint and environmental impact; vulnerable to disruption
Coal with carbon capture and storage, charging battery electric vehicles	9	Still relatively CO ₂ intensive, large impacts on wildlife and high thermal and air pollution
Nuclear power plants, charging battery electric vehicles	10	Risk of death from nuclear proliferation, significant thermal and radioactive pollution
Vehicles running on ethanol made from maize	11	High CO ₂ emissions; high water consumption; chemical pollution
Vehicles running on ethanol made from cellulose	12 (least)	As above, but with added space needed for crops; air pollution

Source: Jacobson, M (2008), 'Review of solutions to global warming, air pollution, and energy security', available: <http://tinyurl.com/8pumpz>

Quick carbon accounting

'Relatively quick and easy'. That's the official conclusion from a groundbreaking trial of personal carbon accounting, on how difficult it would be to automatically capture and report personal carbon emissions for all UK citizens.

In an experiment conducted by the RSA and IT company Atos Origin, 100 volunteers agreed for each purchase of fuel they made at any BP forecourt to be logged and transferred to the RSA's existing personal carbon trading platform. Once the data was collected, information about the quantity and type of fuel purchased was used to calculate the ensuing carbon dioxide emissions. This amount was then deducted from participants' running 'carbon balance', simulating the prospect of full personal carbon trading, seen by some environmentalists as the most

democratic way of reducing emissions.

Atos Origin believes that the systems are already in place to allow for a large amount of data, ranging from utility billing systems to supermarket loyalty cards that are handed over when fuel is purchased, to be collected, and then used to track carbon emissions.

The experiment's conclusion flies in the face of Government scepticism of personal carbon trading. Despite initial enthusiasm under David Miliband's stewardship of Defra, the Department announced in May 2008 that it was shelving its own feasibility assessment of the concept.

Michael King, a consultant at Atos Origin, said that the experiment would help the company to implement similar schemes for organisations that wanted to track their emissions more closely.

IN BRIEF

Ban the banks

A Peoples' Tribunal in Bangladesh has branded the World Bank, IMF and Asian Development Bank as being 'anti-people' and 'evil' and has called for them to pay compensatory damages or be banned from the country.

The ruling came after a day of depositions about economics, health, business and education, both for and against the international agencies.

The two-page judgement highlights how these institutions have undermined food and energy security, destroyed indigenous industry and driven up the cost of basic essentials.

The non-statutory tribunal has broad support from the country's politicians, economists, NGOs and judiciary.

For more information visit: <http://tinyurl.com/ecol-bang-imf>

The cattle grid

A landmark court ruling in France has seen the country's electricity grid operator, RTE, fined €390,000 for harm caused to livestock on a farm underneath one of its high voltage power lines.

The livestock, owned by a family in Latronche, near Bourges, suffered ulcers, bleeding, muscular paralysis and death. The family were eventually forced to move out of the farmhouse to a nearby caravan to escape their own worsening health problems which they blamed on the power line, including respiratory problems and deafness.

'Even if this wasn't proved scientifically and with certainty, the judge considered there was no other possibility,' the court prosecutor told Reuters news agency. RTE plans to appeal the judgment.

Car free, care free

India's first car-free urban zone has been unveiled in the town of Falzilka in Punjab, on the Indo-Pakistan border.

All motorised transport has been banned from the town centre for 12 hours each day, allowing pedestrians and cyclists to move about freely in what is already India's safest urban area.

In a study of the trial, published by the Institute of Transport Planning and Traffic Engineering at the University of Vienna, Austria, over 60 per cent of respondents found an improvement in air quality and over 95 per cent reported a reduction in street crime.

The study also found that social understanding increases when motorised vehicles are removed because of the direct contact between passersby and traders.

Is Fairtrade still fair?

Just one week after coffee giant Starbucks announced that 100 per cent of its espresso coffee would be Fairtrade certified, the founder of an Indian Fairtrade cooperative said publicly that the growth of Fairtrade certification has 'diluted' the marque's commitment to trade justice.

In a speech to a conference hosted by Cooperatives UK, Tomy Mathews, founder of Fair Trade Alliance of Kerala and a proponent of organic farming in India, said that whilst the desire to expand Fairtrade was legitimate it needed to be done in a way that put a central emphasis on trade justice and nurtured the smallholder farmers who were most at risk of fallout from the global economic downturn.

Mathews warned that the need to supply larger volumes of commodities such as coffee and tea meant that plantations, as opposed to individual farmers, were now receiving Fairtrade status. In some cases, he said, awarding plantations the Fairtrade certificate

could simply be requiring owners to implement working conditions which may already be enforced under national law.

'The FLO [Fairtrade Labelling Organisation] inspection regime has to be much more vigilant over welfare of plantation workers,' he said. 'It should stretch the legal minimums for working conditions to a level where benefits really come to the workers.'

His warning was supported by Kathini Maloba, General Secretary of the Kenya Women Workers' Organisation. Maloba said that some plantation owners who received Fairtrade certification seemed more keen to aspire to the publicised successes of the scheme – such as building local clinics or buying ambulances – rather than simply passing on the financial premium to workers in their wages. Because workers were frequently migrants, she argued, they often failed to see any benefits from the community projects on which the premiums were spent.



Mathews also said that consumers should beware of 'Fairwashing' – the use of Fairtrade certification by as a marketing or PR tool.

He advised consumers to look beyond Fairtrade products to Fairtrade businesses, where all of their stock was procured in accordance with the guidelines – a principal he calls 'Fairtrade Plus'. But he also acknowledge that Fairtrade was only one weapon in the fight for fairness in global commodity trade.

'The larger battle for trade justice cannot be won with shopping bag politics,' he said. 'Changing the world one tea-cup at a time is not enough. We should feel good about drinking it, but to assume that it will help in the larger battle for trade justice is way off the mark.'

Bring GM research out into the open

The former chair of the European Food Safety Authority – the body responsible for assessing the environmental and public health risks of GM crops in Europe – has called for more publicly-funded research into GM crops to avoid issues of bias with studies submitted by biotechnology firms.

In an interview with campaign group GM-Free Ireland, Professor Patrick Wall said that an increase in public spending on biotech research would 'give people more confidence' in the risk assessment process:

'There is a huge issue with consumer confidence,' he acknowledged. 'So if consumers would be more confident if we had more publicly-funded research where the researchers had no vested interests in getting their products over the line, that's one thing [we could change].'

Wall also called for biotechnology companies to disclose the complete set of raw data from their crop trials, rather than omit 'commercially sensitive' information:

'There's a dilemma in that when companies submit dossiers they maintain that this is confidential commercial information... [but] it is in the interest of consumer confidence that as much data as possible is in the public domain.'

Notably, Wall was unequivocal that if EU countries believed that it was in their

interest to remain GM-free – even if this was for image purposes, such as preserving a reputation for eco-tourism – then they should be free to do so.

'We cannot force-feed European citizens products that they don't want,' he said. 'We live in a democracy – people have a right to have objections, and if people don't want the technology they've a right not to have it. The idea of marginalising some member states who are anti-the technology is wrong.'

Meanwhile, a report from the US Government Accountability Office (GAO) has criticised those responsible for monitoring the spread of GM crops. The GAO said of the Department of Agriculture (USDA), the Environmental Protection Agency (EPA) and the Food and Drugs Administration: 'The three agencies do not have a coordinated program for monitoring the use of marketed GE crops to determine whether the spread of genetic traits is causing undesirable effects on the environment, non-GE segments of agriculture, or food safety.'

The report came just days after the UK was exposed as lobbying against strict safeguards on the unauthorised spread of GM seed at a high-level EU meeting. The action, which Defra justified as 'pragmatic and proportionate', was seen off by other EU member states.

Down the mines

It wasn't quite a visit from the Ghost of Christmas Past, but it may have made the chairman of British mining giant Vedanta Resources, Anil Agarwal, sit up and pay attention.

On 19th December, angered by an 'Indian Entrepreneur of the Year' award given to Agarwal by UK consultants Ernst and Young, Survival International paid him a visit at his Mayfair home to deliver a gift-wrapped copy of an official complaint made against his company to the Organisation for Economic Organisation and Development (OECD).

Vedanta is planning to turn the sacred homeland of India's Dongria Kondh tribe into an open cast bauxite mine, destroying untouched forest and polluting watercourses in the process. Numerous appeals by the tribespeople to the company have fallen on deaf ears.

In November 2007, the Norwegian government withdrew its investment from Vedanta because of increasing concern over the company's human rights record.



Stick this in your stocking, Anil, says Santa

'This is the critical moment: the next 20 years are absolute crunch time. It's going to be up to people like us to argue about what is a good food system. And it's going to be much more complex and much more messy.' Professor Tim Lang, City University

Pesticide link to bee deaths

A former Washington scientific adviser has called for a worldwide ban on neonicotinoid pesticides that have been implicated in the decline of the honeybee population.

Dr Charles Benbrook, Chief Scientist at the US Organic Center and former Executive Director of the National Academy of Science's Agriculture Board, told an audience at the annual Rachel Carson Memorial Lecture in London that the degree of pesticide contamination within bee hives is 'shocking' and warned that farmers would have to 'do things very differently' if they wanted to keep bees within the agricultural system.

Benbrook said that the honeybee acted as canary in our agricultural coalmine, and that the species' rapid decline should be taken very seriously.

'Neonicotinoid pesticides are the most toxic pesticides ever discovered for bees,' he said. 'Regulators around the world now know this, and yet we are still using them as sprays and seed treatments.'

At the lecture, Benbrook offered a new explanation for how the pesticides might affect the immune systems of bees. He points

to the use of high fructose corn syrup (HFCS) as a feed given to the bees over winter to replace honey taken out of the hive for human use. Benbrook believes that the corn syrup may contain minute traces of neonicotinoid pesticides which were originally used on the maize from which the syrup is extracted.

'High fructose corn syrup is not ideal for bees nutritionally, and if it did contain neonicotinoids, it could be the straw that breaks the camel's back,' he said.

Benbrook has tested a number of samples of HFCS for the pesticide but, whilst some did contain the chemical, he admits that his results are not yet conclusive.

He added that monoculture farming was part of the problem, and said that it was 'impossible' to farm in such a way without being reliant on heavy doses of toxins.

But Benbrook said he believed such farming systems were becoming unsustainable.

'I think agriculture has entered into a phase of dramatic change,' he said. 'We'll see changes in the next 20 years comparable to changes we've seen since we invented agriculture.'

Life beneath the waves is deafening

Our oceans are becoming an 'acoustic fog' of noise, created by shipping, sonar and seismic survey equipment, and the impact on wildlife is serious, according to the Whale and Dolphin Conservation Society (WDCS).

Speaking at the UN Environment Programme (UNEP) Convention on Migratory Species, Mark Simmonds, science director of the WDCS, described the effect for marine animals as living in 'a cacophony of sound'.

'There is now evidence linking underwater noises with some major stranding of marine mammals, especially deep diving beaked whales,' he said. 'However, it also appears that other species may also be affected.'

Low frequency underwater noise has doubled every 10 years since 1950, and the global shipping fleet is expected to double in size by 2025. New sonar equipment generates sound levels well in excess of those created on land by a jet aircraft taking off, and some seismic survey equipment can be heard 3,000 km from its point of origin.

But in an added twist, the situation is set to worsen as a result of climate change. As CO₂ levels rise and the ocean becomes increasingly acidic, the change in sea water chemistry means that low frequency noise may travel even further. Scientists at the Monterey Bay Aquarium Research Institute in the US believe that the ocean may have already becoming 10 per cent less absorbent of low frequency sound waves than it was before the industrial revolution.

If acidity increases in line with climate models, underwater noise pollution could travel 70 per cent further in 2050 than it does today.

The International Fund for Animal Welfare (IFAW) is calling for sonar manufacturers, ship builders, governments and the military to install and use quieter marine technologies and make other efforts to reduce ocean noise levels.

For more, visit <http://tinyurl.com/7apq2a>

THIS MONTH

30 years ago

Although discarded as an economic doctrine, laissez-faire remains alive and well in the field of technology. In the food sector, technological innovation has sparked off a major departure from traditional forms of human nourishment.

The new technology reduces the fundamental biological structure of food, subtracts its important nutrients and alters its molecular architecture. Because this new technology evolved without any input from the biological sciences it has greatly distorted the smooth biological relationship that should exist between humans and the food they eat.

Human health and well-being is inextricably bound up in the quality of nourishment, and the fact that the food revolution has taken place without proper reference to the organic nature of humans has immense implications for the state of the nation's health.

The food technologists have in effect interposed a vast and complex industry between the naturalness of food as provided by nature and the human organism.

With only economic objectives as a guide to the evolution of food technology, it was inevitable that the exacting relationship between humans and nature as expressed through nourishment would become grossly distorted.

Ross Hume Hall, 'What's in a Pizza?', *The New Ecologist*, Jan-Feb 1979.



A heartening recovery?

Does the Aral Sea, the biggest environmental disaster of the 90s, offer us cause for hope? **Paul Miles** reports, and sees parallels with a bigger man-made disaster – climate change

It was often called 'the worst man-made ecological disaster on the planet.' The shrinking of the Aral Sea, once the world's fourth largest lake, resulted in the surreal image of rusting ships stranded on what had become an inhospitable, poisonous desert.

The cause was Soviet irrigation schemes that diverted water from two major rivers, Syr Darya and Amu Darya, to irrigate land, mostly for cotton. Between 1960 and 2004, the sea shrank by 70%. Water levels dropped by 20m and ports, such as Aralsk in Kazakhstan, became stranded 100km from shore. Fisheries collapsed, salinity and pollution levels rose, dust and salt storms affected people's health and even the climate changed, with hotter, drier summers. It was indeed a disaster. The sea split into separate lakes, the smaller Northern Aral Sea (NAS) and the larger, Lower Aral Sea (LAS). Some predicted that it would disappear altogether. The only boom was in the tourist industry. Foreigners, many of them 'experts' would visit to witness the disaster first-hand. The local population used to joke that if each of them had brought a bucket of water, the sea could have been refilled.

Now, with no need for buckets, the Northern Aral Sea at least is recovering with some remarkable results. In 2004, the fish catch was just 52 tons, mostly salt-tolerant flounder. In 2007, the catch was 2,000 tons including many of the original freshwater species, such as sturgeon and pike perch. For

the first time in many years, fisheries in the port of Aralsk are functioning again and fish is being exported to Georgia and Russia. The sea has crept back and is now just 25km away from the harbour. Residents are hopeful that, one day, fishing boats will bob by the docks once more and seagulls will mew overhead, just like the scenes in flaking murals inside the town hall.

'Even the climate is changing for the better. It's true,' says Aralsk's mayor, Nazhmedin Musabaev. 'In April, May and June we now have rain! There is more grass for livestock. Summers are a little cooler. Dust storms are fewer... in a few years, I hope we will be sitting on the harbourside beside the water and enjoying ourselves.'

Two countries border the Aral Sea – Kazakhstan in the north and Uzbekistan in the south. Uzbekistan continues to drain much of the Amu Darya river for irrigation and is the second largest exporter of cotton in the world. There are plans to drill for oil in the dry seabed desert of the LAS. But Kazakhstan has shown how, with determination, a human-made environmental disaster can be reversed.

How did it happen? The words 'dam' and 'World Bank' are like red rags to a bull for many environmentalists. World Bank funded dams such as Nam Theun 2 in Laos, where 70,000 people will have to be relocated, which provoked the wrath of NGOs such as

International Rivers Network. Yet it was a World Bank funded dam that has played a major part in repairing the damage to the Aral Sea. After Kazakh attempts in the late 90s proved that a dam to stop the remaining puddle of the NAS draining away completely, could be successful, Kazakhstan approached the World Bank for funds. In 2001, a US\$86m project was approved for infrastructure developments: a 13km dam (or, as they call it,

perhaps less controversially, on the World Bank website, a dyke) that was completed in 2005 and importantly, improved 'hydraulic structures' along the Syr Darya river that empties into the NAS.

One of the main problems with the use of the river for irrigation was not the amount of water diverted to crops but the much greater amounts that were wasted. In winter and spring, millions of cubic metres of water, unable to pass through the irrigation system, caused floods and then evaporated. New and improved hydraulic structures were completed at the end of last year.

The increased river capacity has helped fill the NAS. The dam's full capacity was reached in 2006 and 2007 with estimated inflow into the NAS during both years about seven billion cubic metres. The surface area of the water reached about 3,300km², 50 per cent more than its lowest level. The next stage of the project, due to start in 2010, will involve the construction of another dam, nearer to Aralsk, to create a two-tier NAS. The sea will lap at the port once more.

Does this story offer us hope? Could humanity work together to reverse what is a far more serious man-made ecological disaster, namely, climate change? 'A combination of technical and institutional interventions in a holistic manner can solve most problems that are either caused by nature or by humans when they are underpinned by good analytical work,' says Joop Stoutjesdijk, project manager, optimistically. 'It also requires commitment from governments.' It will also require far more than just \$86million. Fighting climate change should be how we spend our way out of recession.

Sadly, the story of the Aral Sea is like that of a tricky operation to separate conjoined twins. Although the process of saving the NAS has not caused the much larger LAS to suffer any more than it already was, the chance of the LAS ever recovering is virtually zero. The only hope would be if no water were taken from the Amu Darya for irrigation in Uzbekistan, which is extremely unlikely given the country's dependence on cotton and its fast population growth, says Moscow-based Sergei Roy, author of *Solo on the Aral*.

So while we give thanks for the recovery of the smallest twin, the other one is left to die. Let's hope humanity's response to tackling climate change is more successful.

Paul Miles is a freelance photojournalist



A maritime graveyard in Kazakhstan caused by water loss

PHOTOGRAPH: GETTY IMAGES

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A new generation of biofuels is poised to come into the market. They are greener, say proponents because they can be grown on unused, 'marginal' land and won't compete for our food crops. But just where exactly is all this marginal land, and whose backyard might it be? **Helena Paul** reports

Biofuels

Recent months have seen intense debate over agrofuels – biofuels made from crops. At first they were described as a panacea, a means of addressing climate change and regenerating agriculture and rural regions in Europe and around the world, particularly in Africa. The drive to exploit the global south for production of fuels from food crops such as corn and soya was presented as a development opportunity. However, many questions have since arisen about their true value for reducing greenhouse gas emissions and their impact on food production and prices. The indirect impacts of agrofuel production, such as land-use change, water depletion, waste, the displacement of people, other crops and animals and the human and environmental costs entailed, have become major concerns.

In response, policy-makers have been offered 'second generation' agrofuels. These, we are told, will not affect food production because they will use non-food crops. Technologies will convert the whole plant or tree to fuel, not just the

fruit or seed... (see box page 17). At least that is the vision. However, large plantations will still be required to provide the raw materials and thus, although agrofuels might not compete for food crops, they will certainly compete for land and water. Moreover the technologies may not be commercially viable for 10-20 years.

All this has caused confusion among political decision-makers. The European Union, having decided early in 2007 on a 10 per cent target for agrofuel use by 2020, has been strongly urged to reconsider, by a wide range of organisations and scientists profoundly concerned about the impacts. But the EU has resisted doing so to date. In February 2008, in response to the growing outcry about food prices and the indirect impacts of agrofuels, especially changes in land use, the UK government invited its newly established Renewable Fuels Agency (RFA) to undertake a review of such impacts. However, it continued with its plans to introduce mandatory blending of two and a half per cent of 'renewable' fuels in petrol in April 2008, rising to five per cent by 2010.



2.0



In July 2008, the RFA published the *Gallagher Review* into the indirect effects of biofuel production. The review acknowledges the multiple problems of agrofuel production. But while expressing caution about the 10 per cent agrofuel target, it claims that focusing on ‘marginal and idle lands’ and developing next generation agrofuels may be a solution. Such a claim involves two major assumptions: first, that second generation agrofuels will actually work, and secondly that there is enough ‘marginal’ land in the world to meet these ambitious targets without negative impacts. Unfortunately, neither of these pair of assumptions manages to stand up to scrutiny.

For a start, where is this marginal land that is now presented to us as a solution to current agrofuel problems and the need to expand agricultural production in general? How is it defined? This is a key question, because, as well as marginal, it is variously described as degraded, under-used, abandoned, sleeping, wasteland. These pejorative terms are being widely used to suggest that millions of hectares would benefit from being converted to agrofuel plantations. For example, the Brazilian government asserts that sugar cane in Brazil is mainly planted on ‘degraded’ land, of which it claims there are millions of hectares.

‘Marginal lands support a multitude of livelihoods but also have a critical ecological role’

There is a resounding response to such assertions in *Mausam*, a new Indian magazine on climate change on The Corner House website, which says: ‘Rural and forest communities [...] say that there is no such thing as wastelands. Most of these lands are grazing lands, common pastures, degraded forests and also lands of small and marginal communities. They not only support a multitude of livelihoods but also have a critical ecological role. This is where the government and corporations are pushing for their fuels, displacing thousands of peoples [...]’

‘Pastures and grazing lands in India are often de facto village commons and CPRs (common property resources), many of which form part of the larger forest landscapes and contribute to the forest communities’ economy and livelihoods.’ (see: www.thecornerhouse.org.uk). According to *Mausam* there are millions of hectares of such land in India, vital to local people.

A woman’s place

As soon as one looks at marginal land in this way, it becomes clear that the pattern is repeated worldwide: untitled, common land exists in Africa, South America and across Asia. People may farm a plot individually, but also depend upon the shared resources of the commons. Indeed such land was a vital resource in the UK until the great waves of enclosure that reached a climax in the 19th Century dispossessed and uprooted ordinary people, concentrating land in the hands of a few, driving the majority into cities.

Genuinely marginal land, land that is not vital to local



A willow crop being grown as fuel for power stations as part of a Government trial in Clanfield, Hampshire. In the future, fast-growing, woody crops like this could be turned into liquid transport fuels via second generation biofuel technology.



Old dog; new tricks

First generation agrofuels were made just from the fruit, seed or sap of the plant. Second generation agrofuels are derived from whole plants or trees, including material often classified as waste such as bark, stalks and stubble. The processes for creating fuels from algae, sewage or slurry are not included here (though see *Ecologist* April 2008 for more). See 'What about chip fat?', page 20, for more on deriving fuels from waste oils.

There are two different methods of producing second generation agrofuels: biochemical (including ligno-cellulosic and biobutanol) and thermal (including biomass gasification).

Biochemical methods deconstruct vital constituents of plant cells, cellulose and lignin, using heat, pressure, acid or a combination of all three. Cellulose is broken down into fermentable sugars by enzymes and then fermented into fuel by micro-organisms. Lignin can be used directly as fuel or as a potential source of chemicals currently derived from oil. However, there are many 'biological barriers' to be overcome before these processes are viable.

Thermal methods involve controlled combustion (pyrolysis) to break biomass into bio-oil, bio-char and synthesis gas. Bio-char is currently touted as a 'soil improver' for long-term carbon storage, but this is not wholly proven. Bio-oil and syngas can be used for heat and power or as pre-cursors to transport fuel. Additionally, bio-oil can be used as shipping fuel. A process known as the Fischer-Tropsch catalytic chemical process may be used to convert syngas into transport fuel.

Micro-organisms are being collected, studied and genetically engineered with the aim of reducing energy inputs and streamlining the process of converting biomass into agrofuel. GM research also aims to make plants grow faster, reduce their amount of lignin, or alter their metabolism to increase yield.

Some advocates envision 'biorefineries' producing all current petroleum products from biomass. But even they admit that it will be some several years (if ever) before second generation agrofuels achieve positive energy balance and commercial viability. Moreover, there are serious risks including GM contamination, global land-use conflicts, biodiversity loss and accelerated climate change.

communities, does not exist in the amounts assumed. There are therefore highly damaging assumptions being made, about the true extent of marginal lands available.

Jonathan Davies, global co-ordinator of the World Initiative for Sustainable Pastoralism, Nairobi, Kenya, says: 'In Africa, most of the lands in question are actively managed by pastoralists, hunter-gatherers and sometimes dryland farmers [...] There may be wastelands lying around to be put under the plough, but I doubt that they are very extensive.' In many parts of the world, women still have no property or inheritance rights. So-called marginal land may be the only land they can access. Widows, for instance, are

'Agrofuels production might cause the partial or total displacement of women's agricultural activities'

sometimes given degraded land on which to grow food.

For them, it can make the difference between life and death in hard years because they know how to produce and gather food from it. Thus, according to the UN's Food and Agriculture Organisation 2008 report, *Gender and Equity Issues in Liquid Biofuels Production – Minimising the Risks to Maximise the Opportunities*: 'The conversion of these lands to plantations for agrofuels production might therefore cause the partial or total displacement of women's agricultural activities towards increasingly marginal lands,' which would apply even greater pressure on women and land alike. Female labour on plantations is often exploitative and insecure while men usually benefit the most from cash crops for export.

Label of convenience

Another group regularly marginalised in discussions about development are cattle herders and pastoralists, especially in Africa. They travel across wide areas following the seasonal rains and fresh grass with their animals. External observers often assume that their lives would be improved if they were settled in one place and provided with the means to grow crops. However, the pastoralist way of life, evolved over many generations, often embodies vital knowledge about how to sustain these fragile resources.

At the 11th session (2005) of the working group on Minorities from the Higher Commission On Human Rights, an Ethiopian representative said: 'The pastoral groups of the region traditionally depend on the common property resources consisting of pasture, water and mineral licks. Each has management rules that regulate access and responsibilities. Customarily, land is the collective property of the pastoralists and managed according to specific rules.' Pastoralist communities in particular use highly effective systems of traditional ecological governance to manage their environments, but these are rarely acknowledged in modern development thinking.

Such collective management of land is often invisible to outsiders – whether government or private capital. The convenient concept of terra nullius – empty land –

continues to thrive. The briefing: *Agrofuels and the Myth of the Marginal Lands*, published in September 2008 by the Gaia Foundation and others, reports: 'Icin, an indigenous Dayak from West Kalimantan, Indonesia points at a map of the proposed [agrofuel] plantations, on supposedly unproductive "sleeping" land. "Actually there should be seven villages marked in this area. But they are not mentioned. Does this mean, for the outside world, we do not exist any more?"'

Where convenient, the presence of people may be recognised by agrofuel proponents. Smallholder farmers are often cited as the likely beneficiaries of agrofuel developments, especially oil palm and jatropha, because these require labour, but according to Olivier De Schutter, United Nations Special Rapporteur on the right to food, in his report to the UN General Assembly: 'there is a real risk that export-led agricultural development will further marginalise the position of smallholders, worsening their food insecurity instead of improving it.'

Thus land that might appear 'marginal' to one person can be a vital resource to another. It may seem idle, degraded or underused, yet can provide vital food, fuel, medicine and building materials to local communities. It may be collective or common land used by such communities for generations, without the security of formal title to it.

Yet, as De Schutter notes: 'No governmental delegation present at the High-Level Conference on World Food Security [held in June 2008 as the food crisis increased] mentioned agrarian reform or the need to protect the security of land tenure.' Land reform is constantly sidelined by governments, but becomes ever more urgent in the context of agrofuels. This is because, while there is a natural limit to the demand for food crops, demand for agrofuel crops is potentially inexhaustible, because of the energy dependence of industrialised countries and the fact that



Jatropha, a one-time weed now being planted and grown for biofuel



Jatropha: myth or reality?

The oilseed bush *Jatropha curcas* is often cited as an ideal fuel crop that can be grown on marginal land with poor soils and little water in developing countries.

It is claimed that vast amounts of such land are available, thereby avoiding competition with food production on good, well-watered land. *Jatropha* plantations already exist in Africa, Asia and South America.

However, there is no previous experience of growing *jatropha* on a large scale and little is known about it, except that, although it may survive drought and poor soil, it is unlikely to produce a worthwhile crop under such conditions.

Jatropha growing requires labour and thousands are being promised jobs and income, but there is no guarantee that it will be viable.

At an expert meeting in Brussels in 2007, the Dutch research institute Plant Research International found that 'any claims of low nutrient requirements, low water use, low labour inputs, the non-existence of

competition with food production, and tolerance to pests and diseases are definitely not true in combination with high oil yield production.'

Fuels from Agriculture in Commercial Technology (FACT), an expert group based in the Netherlands, warned in a position paper (2007) against large-scale plantations of *Jatropha* for at least four or five years, until sufficient experimental data is available: 'At this stage, it is important to distinguish between "reality", "promises" and "dangerous extrapolations",' it said.

FACT's research suggests that optimal oil production from *jatropha* requires significant annual rainfall of up to 1000-1500 mm/hectare, considerably larger amounts than generally fall on what is usually considered 'marginal land.'

Evidence suggests that many agrofuel investors know this already, and are therefore choosing to develop their *jatropha* plantations on well-watered, fertile lands, and not on 'marginal' lands.

fossil fuel is far more energy-dense than biomass. Even if agrofuel growers benefit. 'Food security might suffer, for instance as a result of the increased price of land or a diminished availability of food.'

De Schutter warns against trying to shape development through export crops, yet this is exactly how the agrofuel agenda is promoted in many regions.

People and their land

The interaction between people and marginal land may be subtle and complex. Dr Melaku Worede, a renowned Ethiopian geneticist, one of the founders of Seeds of Survival and a specialist in uncultivated biodiversity, says that marginal land with poor soils can be home to a highly biodiverse population of plants and animals in dynamic interaction. In parts of Ethiopia, these lands are not actively managed, and small farmers frequently leave areas undisturbed alongside the fields they cultivate. Although little studied, such marginal areas may prove to be important reserves. Because plants on marginal land must continuously adapt to harsh, often rapidly changing conditions, such land could be a vital source of genetic diversity for resistance to stresses such as drought, disease and pests in the future, especially as climate change threatens the viability even of locally adapted crops.

It is deeply ironic that climate change, already a serious threat to biodiversity and food production, may be accelerated by the conversion of marginal land to crops for biofuels – ostensibly to tackle climate change. Yet, while there is some discussion about how changes in land use increase global greenhouse gas emissions, for example when forests are cleared for crop production, we hear less about localised climate change caused by land-use change. Projections indicate that changing from grazing to crop production in East Africa would make some areas wetter

What about chip fat?

So, is there such a thing as a sustainable biofuel? In a word, yes, but probably not in the kind of quantities of which governments and industry dream.

The greenest way to produce biofuel is to make it from waste products destined either for incineration or landfill.

The best known process is to refine it from waste cooking oil. In 2003, the UK produced some 100,000 tonnes of waste vegetable oil, which could yield roughly 110 million litres of biodiesel. That may sound like a lot, but bear in mind that in 2007, the UK burnt its way through more than 26 billion litres of road diesel fuel alone. In other words, the proportion of mineral diesel that could be replaced by waste chip oil is roughly 0.4 per cent of our current demand.

Environment Agency estimates suggest that there is perhaps another 100,000 tonnes of waste oil available which is currently simply being dumped or flushed down drains and Thames Water believes that 100 tonnes of fats, grease and oils enter the capitals sewers every day. If this proved true for the rest of the UK, then there might be an extra 200,000 tonnes of potential biodiesel to be had. Some are already trying – in Brazil, state-owned oil company Petrobras is developing a technique to skim the fat off ponds of sewage and convert it to biodiesel. But even if the Thames Water estimate proved correct, the UK would struggle to supply 1.5 per cent of its current diesel demand from waste fats.

What about other forms of waste? There are plenty of old car tyres – some 18.4 million of them after some are used in engineering or surfacing projects – that end up in landfill each year but which could be turned into diesel using a technique known as pyrolysis. But, according to work by the University of Strathclyde, even converting all the available tyres to fuel would only produce 0.09 per cent of the country's diesel requirement. One established



Cattle herders and pastoralists in Africa especially are increasingly left out of the debate over marginalised land

and others drier, with more extreme floods and droughts and greater temperature differentials. The website of the International Livestock Research Institute reports that a joint African/US initiative, the Climate Land Interaction Project: 'provides evidence of the complex connection between regional changes in climate and changes in land cover and land use. New study results are warning that the conversion of huge areas of pasturelands to croplands in east Africa will be a major contributor to global warming in the region.' And this for the continent already projected to suffer some of the worst impacts of global climate change.

Yet the pressure for a 'green revolution' for Africa and the perception that it is the 'new agricultural frontier' could lead to the rapid and violent conversion of pasture and other 'marginal' lands to crops. It also provides a good pretext for land-grabbing, as prices are set to rise. The market is certainly taking an interest. Mark Twain once quipped: 'Buy Land: they're not making it any more'. Recognising that agriculture may be entering a period of scarcity and hence high prices, and also fleeing the property downturn, speculators and corporations have moved into land and crop commodities. Indeed speculation and hoarding were at least partly to blame for high food prices in recent months. Hedge funds and corporations have also recognised the opportunity for profits. Emergent Asset Management, based in the UK, recently launched its African Agricultural Land Fund, inviting investors to participate in 'the growing Sub-Saharan agricultural sector'. In its 2007 report, *Agrofuels in*

PHOTOGRAPHS: GETTY IMAGES

technology that could give us sustainable automotive fuel is anaerobic digestion, where organic wastes such as manures and food waste are heated in the absence of air to produce carbon dioxide and methane. This 'biogas' can then be used to power cars, buses or trains. Sweden already runs nearly 800 biogas buses, as well as a specially modified train and some private vehicles.

In the UK, we throw away 6.7 million tonnes of food waste every year, according to the Government's 'Love Food, Hate Waste' campaign. So how much of this could be used to fuel our cars?

Let's assume that we managed to collect half of that waste from people's homes. Putting that into biogas digesters, taking some energy out to run the process, clean the gas and compress it for vehicle use would give us about 209 million cubic metres of fuel. In 2007, we drew just shy of 24 billion litres of petrol from the pumps. One cubic metre of biogas displaces about 1.1 litres of petrol, which means that even this large quantity of gas would only fulfil just under one per cent of current demand, or perhaps up to two per cent if we managed to collect every last scrap of food waste.

Do these depressing percentages mean that we should give up on truly sustainable biofuels? Only if we remain wedded to the notion of private car ownership, powered by hydrocarbon fuels. In 2006, the UK's bus fleet burned through 1.8 billion litres of diesel. Add together the fuel we could produce from waste cooking oil, waste tyres and biogas (roughly 337 million litres), and we could run one fifth of our bus services on carbon-neutral, sustainable biofuel – that's a target that is really worth aiming for. **Mark Anslow**



‘Such land can be vital for local people, yet they may be invisible to policy makers, conveniently so for corporate agendas’

Africa: the impacts on land, food and forests, the African Biodiversity Network found that cases of 'land grabbing' had accelerated with the new influx of agrofuel developments.

Marginal land in the US and the EU

Even the US and the EU are not immune to the 'marginal land' issue. In some cases, land set-aside in the EU and conservation reserve land in the US may be 'marginal' because it is dry, has poor soils or steep gradients – yet may have a vital function within the ecosystem. For example, the US Conservation Reserve Program has been extremely successful in protecting biodiversity and water, reducing soil erosion and providing natural flood control. According to US government figures, it prevents 408 million tonnes of soil erosion and sequesters nearly 21 million tonnes of carbon a year. Yet across the US and EU, millions of hectares of previously set-aside land (approximately 10 per cent of the cropland in each region) are now being planted,

following pressure from the agroenergy lobby and high commodity prices, which agrofuels have helped to push up.

To focus on 'marginal' land for agrofuels is extremely risky. Such land can be a vital resource for local people, who are often its most effective managers, yet they may be invisible to corporations and policy-makers, conveniently so for corporate agendas. Marginal land often plays a key role in protecting biodiversity, water and soil. That there are interactions between land-use change and climate change is clear but the dynamics are little understood. One thing is certain: they go far beyond the facile and deceptive emission counting beloved of bureaucrats and carbon traders. We already face an unpredictable future with increased extremes of temperature, rainfall, winds, droughts and violent weather events. Biodiverse ecosystems have a critical role to play in stabilising climate. And as far as plant genetic resources are concerned (a dry term for something our lives depend on!), so-called marginal land could be crucial. It must not be recklessly drenched in fertilisers and chemicals and planted with crops for unproven fuels in an attempt to avoid genuine adaptation to the end of the fossil fuel age and energy dense consumption patterns. If we do not act responsibly, we could further marginalise our survival. This is no idle threat.

Helena Paul is an author and ecological campaigner who has specialised in indigenous people's land rights, biodiversity and corporate responsibility

The Big Fix

Somebody somewhere has to have a cunning plan to fix our environmental problems and save the world – right? **Jim Thomas** sorts through the big tech ideas you'll be reading about this year



Almost every day sees new technologies being proposed to fix old problems. 2008 witnessed global technology fights over the rapid development of biofuels, protests against 'clean coal technology' and GM crops staging a come-back of sorts. In all three cases, 'solving climate change' was presented as the excuse for gambling on high-risk technologies. That theme is likely to continue. Here are a selection of technological controversies on the drawing

board. See if you can sort through the silver bullets, technofixes and false solutions that are sure to keep cropping up this year...

Geo-engineering

Three years ago, the idea of re-engineering the Earth's climate was considered politically unacceptable. In 2009 though, geo-engineering, intentional large-scale manipulation of the climate, is poised to enter mainstream climate policy discussions. High-risk projects are now gaining a shocking respectability as panic rises

over climate change. They include polluting the upper atmosphere with sulphur nanoparticles to reflect sunlight back to space or changing the chemistry of the ocean to absorb more carbon dioxide. Former climate change sceptics such as Newt Gingrich and several right wing think tanks have started to promote geo-engineering as a painless quick-fix which would bypass the need for emission reductions. This summer, the UK Royal Society will publish a report purporting to weed out the good geo-engineering schemes from the bad.



Unfortunately, it will be written mainly by geo-engineering enthusiasts. Despite a global moratorium on one ocean geo-engineering technique, fertilising the ocean to grow CO₂-gobbling plankton, India may launch a pilot scheme this year and private geo-engineering company Climos threatens to take to the seas in 2009 or early 2010.

GM insects

If the thought of GM pollen spreading on the breeze worries you, then watch out – the

latest GM products have wings! In 2009, Oxford based Oxitec intends to become the first company to sell genetically modified insects for large scale release. Oxitec has developed a GM pink bollworm (moth larvae) that it claims will mate with natural bollworms (a cotton pest) and render them sterile. However, Oxitec's plans don't stop there. This also looks to be the year when it will proceed with a large scale trial release of genetically modified mosquitos also intended to spread sterility in wild populations. Oxitec,

which received a \$5m grant from the Bill and Melinda Gates Foundation, claims the technology will help wipe out dengue fever which is on the rise as climate change bites. The 'terminator mosquitos' were due to be released on Pulau Ketam island, which lies off the coast of Malaysia, but local Chinese fishermen raised concerns that they are being used as a test bed. Further experiments of this type have been planned for Mexico and India. Biosafety experts warn that the genes may spread, the sterility plan may fail and the

ILLUSTRATION: GETTY IMAGES

product may contravene a global moratorium on terminator (sterility) technology.

Synthetic biology

Every few years a technology platform upgrades itself – handguns become machine guns and VHS becomes DVDs. Right now genetic engineering is in the process of reinventing itself as synthetic biology – an extreme form of genetic engineering that allows the genetic code of organisms to be built entirely from scratch. With more than a dozen synthetic biology companies aiming to put products on the market in the next couple of years and major investment by the likes of BP, Du Pont, Chevron and Goodyear, 2009 may be the year the public notices a multibillion artificial life industry is now well established. In particular, expect front page headlines this year if genome tycoon J Craig Venter succeeds in bringing to life the world's first entirely synthetic bacterial species, dubbed Synthia. He has already applied for patents on a method that he claims will make millions of such synthetic species every day – a prospect that dwarfs the current trickle of GM organisms and may overwhelm our inadequate GMO laws.

Nano-regulation

If you received new socks or cosmetics this Christmas, there is a good chance you might already be wearing nanoparticles – tiny engineered lumps of matter with unusual industrial properties. Although nanoparticles have been used unlabelled and untested in hundreds of consumer products for several years now, governments and consumer watchdogs are now finally cottoning on to the new toxicity problems that these novel materials may pose. In September, 70 governments, 12 intergovernmental organizations, and 39 nongovernmental organizations participated in the Intergovernmental Forum on Chemical Safety in Dakar, Senegal. They agreed producers should label nanomaterials in consumer products and that countries should have the right to refuse imports of nanoproducts. In November, the UK's Royal Commission on Environmental Pollution joined the growing chorus of concern about the lack of nanoregulation and the Austrian government called for a moratorium on food uses of nanotechnology. The coming year is likely to see increased efforts by trade unions and consumer groups to get some oversight of nano-risks. In May, the issue will go to the UN's International Conference on Chemicals Management. The European Commission already accepts new labelling laws may be needed for nanotechnology products.

Cellulosic biofuels

After last year's food price crisis you would be hard pressed to find anyone still arguing the

case for turning food crops into ethanol. Instead the new orthodoxy among biofuel advocates is that a 'second generation' of bio-based fuels (see this month's cover story) will soon power our cars without affecting food. Using modified microbes or heat, companies such as Mascoma and Koskata are this year commercialising 'cellulosic biofuels', turning cellulose sugars (found in the woody part of plants and trees) into vehicle fuel. By switching from food crops towards wood and 'agricultural waste' (such as corn stalks) they hope to sidestep the 'food vs fuel' debate. If it works, expect to see a massive corporate grab on plant matter and a new debate over biomass. Forest communities will oppose the increased forest destruction associated with cellulose production for fuels. Sustainable agriculture advocates will argue that removing corn stalks from fields will deplete soils and increase fertiliser use and GM campaigners will express alarm at the threat of powerful modified microbes escaping.

Biochar

Take wood, turn it into charcoal and then bury it in the soil – that's the basic technique behind

biochar, sometimes referred to as agrichar. Its promoters claim this technology can deliver a triple whammy of removing carbon dioxide from the atmosphere, improving soil fertility and increasing crop yields. In the last three years, a rash of biochar start-up companies has emerged – led by eco businessmen such as organic pioneer Craig Sams of Green & Blacks or carbon offsetting pioneer Dan Morrell of Future Forests. Advocates talk of planting a billion hectares of fast growing plantations to suck carbon dioxide out of the atmosphere and bury it in soils, speeding up the carbon cycle and maybe earning carbon credits in the process. Look for opposition from forest activists. They wonder where the research is that shows biochar does actually improve all the different kinds of soils there are, as opposed to the most arid ones, and see the biochar associated rapid expansion of monoculture plantations as a threat to stressed forest ecosystems and to communities.

Spaceflight

Expect to hear a lot about spacecraft in 2009 – not from the boffins at NASA but from the brand new space tourism industry. In early

'He has applied for patents on a method he claims will make millions of synthetic species every day.'



PHOTOGRAPH: EQUINOX GRAPHICS / SCIENCE PHOTO LIBRARY



Opposite: Synthetic biology is set to be the scary new genetic engineering caption. It will allow the genetic code of organisms to be built entirely from scratch

Left: Climate campaigners are uncertain about the impact of space travel, but companies like Virgin Galactic claim space travel is 'eco friendly'

PHOTOGRAPH: VICTOR HABBICK VISIONS / SCIENCE PHOTO LIBRARY

2010, Virgin Galactic hopes to start the first regular commercial flights to outer space and will be running tests of its Spaceship Two rocket throughout 2009 with celebrity passengers on board. Billionaire Virgin boss Richard Branson is locked in competition with at least two other commercial companies – SpaceX and Rocketplane Global which hope to kick off a multi-billion pound commercial space industry. As publicity ramps up, Virgin Galactic is preparing itself for criticism from the same climate campaigners opposing regular air travel. Virgin Galactic public relations folks claim that a trip to the edge of space is less carbon-intensive than a London-New York air flight and they are offering to run atmospheric experiments from their spacecraft to help understand climate change better. An early passenger will be controversial ecologist James Lovelock who sees no problem in blessing the new spaceflight industry just as he has given his approval to the nuclear industry and to geo-engineering. The first flights will run out of the Mojave desert and later Spaceport America in New Mexico but Virgin Galactic is also considering building a Spaceport Scotland at RAF Lossiemouth for flights from 2013. After recent UK campaigns against airport expansion, maybe we'll soon see spaceport campaigners locked on to launchpads too?

Data centres

If you think reaching outer space increases carbon emissions, consider the climate costs of accessing virtual space. According to one set of calculations, every search query carried

out on the internet uses 11 watt hours of energy – the equivalent of releasing seven grams of carbon. Behind the seemingly weightless world of websites and social networking, huge data processing warehouses suck up energy to run rows of computer servers and whirring cooling fans. Such datacentres are proliferating fast. Management consultancy McKinsey estimates that by 2050, data centres will be responsible for more greenhouse gas emissions than the airline industry, as the digitalisation of medical records, libraries and genomic databases swells the global need for switched on servers. Some data centre users are stepping up to the energy challenge. Google aims to be powering their so-called 'google-farms' with renewable energy and is investing accordingly but there may be other problems to tackle. Like e-waste.

As the global data centre boom gets underway, the need for cheap, upgradable server equipment – chips, boards and plastic casings – will become a major new source of electronic waste, releasing toxic chemicals in both assembly and disposal. In the past three years, environmental groups such as Greenpeace and Silicon Valley Toxics Coalition have had major successes forcing home PC makers to green their products. In 2009 it may be time to take on Google, Amazon, Ebay, Yahoo and Facebook too.

Obama's chief technology officer

With the advent of a new commander in chief, the United States is also being promised a new czar for all matters technological – a 'chief

technology officer'. Who the geek-in-chief might be has set the technology press alight with speculation. Will it be Eric Schmidt, the CEO of Google? (Apparently not.) Might it be Bill Gates recently retired from Microsoft? (We certainly hope not.) How about software hero Bill Joy, famous for raising concerns about nanotech, genetic engineering and robotics? (That would be interesting).

Why this matters is that it signals that Obama intends to put the interests of the technology sector at the heart of his new administration complete with a corporate-inspired job title. For those hoping this administration might bring back the much-missed Office of Technology Assessment or bring some participatory democracy to technology policy, there is likely to be disappointment. The new chief geek may carry out some socially useful tasks such as fending off the monopolisation of the internet and reforming patent law to make room for open source systems.

On the fundamentals of who controls and assesses new technologies however, all signs are that corporations and the military will hand over none of that power. Expect howls of protest when whoever it is cashes in their personal technology stock options tax-free under a little-known loophole and further howls when the fearless new geek leader turns out to hold patents, maintains corporate ties or other conflicts of interest.

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10

THINGS YOU DIDN'T KNOW ABOUT BIRD FLU



3 The deadliest outbreak in human history was caused by a bird flu virus

The 1918 flu pandemic killed more people in 25 weeks than AIDS has killed in 25 years. Half the world's population was infected and 50 to 100 million people – about 2.5 per cent of the population most in the prime of life – died within a few months' period. No war, plague, or famine has ever killed so many people so quickly. Brilliant medical detective work, which included digging up corpses of the pandemic's victims found frozen in the Alaskan permafrost for tissue samples, revealed that humanity's greatest killer appeared to come from bird flu.

A dose of flu in winter is as inevitable as a broken boiler – and usually as harmless. But as public health expert **Dr Michael Greger** explains, intensive farming of animals around the globe may mean we are hatching out an influenza timebomb

1 Their bugs are worse than their bite

The biblical concept of 'dominion over the fish of the sea and over the birds of heaven; and every living thing that moved upon the earth' has populated a veritable Pandora's box full of human-kind's greatest killers. Scourges such as smallpox and measles, which have claimed hundreds of millions of lives in recent centuries, were birthed in the barnyard about 10,000 years ago. Smallpox likely came from camelpox and measles from the rinderpest virus of cattle.

Before the domestication of ducks, there was likely no such thing as the human flu or influenza pandemics. Domesticated pigs probably gave us whooping cough, and water buffalo, leprosy. Horses likely gave us the common cold. How often did horses have chance to sneeze into humanity's collective face until they were broken and bridled? Before then, the common cold was presumably only common to them.

2 All avian influenza viruses start out harmless to both birds and people

All bird flu viruses seem to arise innocuously out of the perpetual, benign reservoir of waterfowl influenza. Though they begin as so-called low pathogenicity [disease-causing] viruses, under extreme circumstances, some strains can mutate into a deadly, highly pathogenic form.

Evolutionary biologists blame overcrowded, stressful, unhygienic environments for this transformation, such as the trench warfare conditions in World War I that may have led to the pandemic of 1918. In more recent decades, intensive animal production practices, such as the overcrowded confinement of billions of farmed birds in filthy, football field-sized sheds that are forced to lie beak-to-beak in their own waste, likely led to the emergence of avian flu, H5N1.

4 The way we treat animals can have serious global public health implications

To support the tropical logging industry, the bushmeat trade shoots, butchers, smokes and sells as food dozens of species of primates, including thousands of gorillas, chimpanzees, and other endangered great apes. HIV/AIDS is considered to be a result of this trade. Someone butchered a chimp a few decades ago and now 20 million people are dead. At live markets, shoppers can not only pick up wild animals that are often confined in cramped, stressful, unhygienic conditions, but also SARS, the deadly disease traced back to these storefront and street-side shops.

The spread of monkeypox was a direct result of the exotic pet trade, a multibillion-pound industry in which hundreds of thousands of different species of live animals are transported across national lines. And, the increasing industrialisation of animal agriculture has been blamed for a long list of deadly new pathogens, including the Nipah virus, E. coli O15:H7, antibiotic-resistant 'superbugs,' mad cow disease and the newest disease to threaten our global community, the hypervirulent strain of avian influenza, H5N1. Never before have so many diseases appeared in so short a time. According to the US Institute of Medicine of the National Academies, we may soon be facing a 'catastrophic storm of microbial threats.'

5 H5N1 has 10 times the mortality rate than the deadliest flu virus on record

Millions of people come down with the flu every year. What if it suddenly turned deadly? The mortality rate of the seasonal flu is 0.1 per cent. The 1918 pandemic was 25 times deadlier (2.5 per cent), and the Asian H5N1 strain appears 25 times deadlier still, having killed approximately 60 per cent of its known human victims. That means an H5N1 pandemic may have the potential to make the 1918 pandemic seem like the regular flu in comparison. For instance, if H5N1 were to trigger a pandemic today, without losing any of its virulence, 50 per cent of the world could theoretically be infected but 60 per cent of those could die. No one knows when or how bad the next flu pandemic will be, but if a virus like H5N1 pulls the trigger, it could be like combining one of the most contagious diseases – flu – with one of the deadliest, akin to crossing Ebola with the common cold.

6 The next pandemic may be triggered by a virus of our own hatching

All three of the world's leading authorities – the World Health Organization (WHO), the Food and Agriculture Organization of the United Nations (FAO), and the World Organization for Animal Health (OIE) – blame in part the intensification of the global poultry industry for the emergence of H5N1. The United Nations specifically calls on governments to fight the role of 'factory farming' which, combined with live bird markets, provides what it refers to as 'ideal conditions for the virus to spread and mutate into a more dangerous form.'

7 A quirk of nature makes chickens potential human pandemic stepping stones

The respiratory tracts of chickens bear a number of similarities on a molecular level to our own primate respiratory tracts, allowing chickens to bind human influenza viruses and vice versa. This could mean that as influenza viruses like H5N1 mutate to get better and better at infecting and killing chickens, they may be getting better and better at killing us. Chickens would seem the most threatening possible species to be exhibiting human virus binding attributes, as they are the one animal in the world we raise by the tens of billions every year. Spread wing-to-wing, the number of chickens killed every day for human consumption would wrap more than twice around the world's equator.

8 A handful of breeding corporations controls the global genetic poultry stock

Because of selective breeding (and, to a lesser extent, growth-promoting drugs), the overwhelming majority of chickens raised for meat have been manipulated to grow so fast to reach slaughter weight in the shortest possible time that their cardiovascular and skeletal systems can collapse under their unnaturally heavy weight. Their abnormally rapid growth also outpaces their immune systems, leaving them susceptible to disease, particularly when raised in industrialized sheds, lying in their own excrement without the sanitising benefits of sunshine (the UV rays in sunlight have been shown to effectively destroy H5N1 in 30 minutes).

Combined with an array of virulent chicken immunodeficiency viruses, the emergence of which has also been blamed on intensive confinement systems, the industry's continued focus on breeding for the fattest rather than fittest has resulted in a global monoculture of chickens with built-in immune dysfunction, convenient viral fodder for the initiation and spread of bird flu viruses with human pandemic potential.

9 An outbreak of bird flu in Europe in 2003 infected more than 1,000 people

In the 2003 Netherlands outbreak of a highly pathogenic bird flu virus, H7N7, symptomatic poultry workers passed the disease to 59 per cent of household family members, a human-to-human transmission efficiency comparable with seasonal flu. Thankfully, the virus only killed one person – one of the attending veterinarians. We learned from this outbreak that bird flu viruses are capable of evolving directly to jump from person to person, while H5N1 has shown us that the virus can evolve into an efficient human killer.

Since the global industrialisation of the poultry industry, highly pathogenic avian influenza has gone from an extremely rare disease to one that now crops up every year. The number of avian outbreaks in the first few years of the 21st century already exceeds the total number of outbreaks recorded for the entire 20th century. If this trend is allowed to continue, a pandemic strain could potentially arise that presents the worst of both worlds – contagious and deadly.

Michael Greger, MD, is director of public health and animal agriculture at The Humane Society of the United States. His latest book, *Bird Flu: A Virus of Our Own Hatching*, is now available free at: www.BirdFluBook.org. Article references at: <http://tinyurl.com/BirdFluScience>.

10 There have been calls from scientific authorities to deintensify animal agriculture

University of Hong Kong Professor Emeritus Kennedy Shortridge, credited for having first discovered the H5N1 virus in Asia, was among the first to blame the 'crux of the problem' on the emergence of chicken factories in China, some of which now confine 10 million birds at a single operation. Measures as simple as providing straw bedding for pigs so they don't have the immunosuppressive stress of lying on bare concrete their whole lives can decrease swine influenza infection risk.

A 2007 editorial in the *American Journal of Public Health* entitled 'Chickens Come Home to Roost' went further, questioning the prudence of raising so many chickens in the first place: 'It is curious... that changing the way humans treat animals... at the very least, radically limiting the quantity of them that are eaten, is largely off the radar as a significant preventive measure.'

'Such a change, if sufficiently adopted or imposed, could still reduce the chances of the much-feared influenza epidemic. It would be even more likely to prevent unknown future diseases that, in the absence of this change, may result from farming animals intensively... Yet humanity does not consider this option...'

The editorial concludes: 'Those who consume animals not only harm those animals and endanger themselves, but they also threaten the well-being of [future generations]... To switch avian images, it is time for humans to remove their heads from the sand and recognize the risk to themselves that can arise from their maltreatment of other species.'

FREE Pandemic Prevention DVD

The *Ecologist* and Sheepdrove Organic Farm bring you an exclusive offer. Peter and Juliet Kindersley of Sheepdrove Farm were so impressed when they saw Michael Greger speak they wanted to support the Humane Society of America. They fully believe in Michael's views about a pandemic and offered to finance the DVD through The Sheepdrove Trust. The first 500 readers to email (sales@sheepdrove.com) will receive a free copy of Michael Greger's *Pandemic Prevention*, which explains how viruses evolve and how humans 'help'. You only need to supply an SAE. Postage details will be sent via email once you reserve your DVD.

Closing date is 19 February 2009; DVDs will be sent within 28 days of then. All enquiries to Sheepdrove at the above email address; please put 'Free DVD Offer' in the subject header. Offer open to UK readers only. DVD compatible with most UK DVD players and can be played on PCs.





What on earth are we thinking when we go into shops and buy lots of pointless stuff we just don't need? **John Naish** says it's not so much what's on our minds, but which brain we use when we spend

OOPS

WRONG BRAIN!



dered by modern life into feeling beset by famine and poverty, despite the abundant sufficiencies surrounding us. This creates great fodder for consumerism, but it threatens to send us knuckle-dragging into ecological disaster. The alternative is currently taboo: changing tack, from a low-brain culture to one that actively fosters our civilised higher cortex.

This grey-matter crisis results from the way our neocortex, the intelligent brain we evolved in the Pleistocene era, runs alongside far older systems driven by primordial instinct. The American neuroscientist Paul MacLean calls this the 'triune brain', a structure resembling an archaeological site inhabited by successive civilisations. At its core is the reptilian brain, responsible for arousal, basic life functions and sex. The old-mammal brain, which learns, recalls and emotes, surrounds it. The new-mammal neocortex sits on top.

We love to believe (because our neocortex tells us) that our civilised brain makes the decisions. But studies show that the opposite frequently occurs. Many actions are determined bottom-up. Our primitive circuits react and decide first, then we become aware – and consciously rationalise our judgments. The amygdala, the core of our ancient fear and attachment circuits, can react to a threat in less than 100 milliseconds. It takes about 600 milliseconds for our higher brain to process an experience and register it consciously. Research published in April 2008 in *Nature Neuroscience* by Germany's Max Planck Institute says that we may consciously make 'decisions' up to seven seconds after the lower brain has taken the casting vote. This is dangerous because our lower brain is bamboozled in myriad ways by 21st-century culture. Take a simple stimulus such as video screens: our primitive brains have a rotten sense of geography, so when we sit on sofas watching footage of a massacre overseas, our instinctive minds don't think, 'Phew, that was thousands of miles away.' They believe that it must be close by, within the narrow scope of a Neolithic human's wanderings. We feel compelled to learn everything we can about this 'nearby' threat, so stay glued to the news. The constant stimulation can cause continual stress. Some psychologists believe the effect is so strong that we should limit our news-watching to only 30 minutes a day or risk anxiety-related depression.

Even worse, perhaps, our info-drenched culture may ultimately stop our species evolving by killing our desire to switch off the screens and do anything purposeful. The danger lies in the lure of virtual reality, which provides short-cuts that enable our brains to experience exciting biological cues, such as

attractive and willing mates, that they have been built to seek in the real world. As the evolutionary psychologist Geoffrey Miller points out in *What Is Your Dangerous Idea?* (2007), our subconscious brains don't care that these stimuli exist only as cheap pixellated fakery, they still get turned on just as much. This can explain why people increasingly prefer to watch porn rather than pursue sexual intimacy in a complex human relationship, play virtual video sports rather than practise real-world athletics and watch *Friends* rather than spend time with friends.

Celebrity stupor

Celebrity culture itself addles our lower brains, which think that beautiful product-endorsing people they keep seeing are the alpha members of their virtual tribe. Our instincts urge us to imitate the celebs' every habit in the hope of gaining entry to the VIP circle. We are also wired to perpetually fear being snubbed by such alphas. Roy Baumeister, a psychologist at Case Western Reserve University who has conducted tests where individuals are made to feel rejected from attractive groups, says that the ostracism makes their IQ and self-control plummet and their impulsivity rise. 'It strikes a blow that seems to interfere with our ability for complex reasoning,' he reports in *The Journal of Personality and Social Psychology* (Oct 2002). 'You may do stupid things.' Thus our constant sense of exclusion makes us more likely to dumbly, impulsively buy stuff – because it is 'owned' by figures whom we desperately want to love us.

We needn't be slaves to such low-brained drives. Creating a culture that gives our reasoning higher cortexes time and encouragement to intercede can liberate us from much confusion. For example, just pausing between deciding to buy something and taking it to the check-out dramatically increases the chance of a no-sale, says a new study in the December 2008 *Journal of Consumer Research*. The pause gives our higher brains a vital opportunity to restrain a primitive neurochemical response. MRI scans performed at Emory University in 2005 show how the powerful feel-good chemical dopamine is released in waves around shoppers' brains as they first see a tempting product, then ponder buying it. But dopamine is about the hunt, not the trophy: anticipation, rather than buying, releases the chemical. Once you've made a snap purchase, the chemical high dissipates in minutes, often leaving a sense of regret that retailers call 'buyer's remorse'. The new study shows that briefly interrupting the purchasing process can dramatically change a shopper's priorities, from being fixated on the consumer

The past 20 years have given our culture ample chance to understand that spiralling consumption imperils the planet and that earning and consuming above society's median levels brings no greater contentment. But still society strives ever harder. Even in the midst of the credit crunch, there is no popular debate on using our reduced economic activity as an opportunity to build a sustainable future. Mainstream opinion seeks only to return to the 'norm' of perpetual expansion. It's a prime case of what psychologists call cognitive dissonance, believing one thing but doing the opposite: like a 60-a-day smoker, we know our behaviour will kill us, but we can't stop. Why?

Medical-scanning science makes the answer increasingly clear. Our culture over stimulates the wrong parts of the human brain – the primitive areas that are bewil-

'Consumerism conditions us to pin our purpose on the next hit. We lose delight in the abundance around us'

item to taking a higher-brained perspective – do they really want it in the first place? Taking a walk around the block may defuse our acquisitiveness, but our hurried culture often makes us feel too harried.

Indeed, all this low-brained pursuit of consumerist shadows makes our culture accelerate ever faster as our instincts drive us to chase harder. This further inhibits our civilised higher brains' ability to mitigate our primeval instincts, because our higher circuits need time to intervene. Robert Levine, of California State University, has seen this time-starved selfishness in action globally. He has measured the exponential increase in pedestrians' walking speeds in cities around the world, and reports in *Social Research* (July 2005) that as people move faster, they become less socially linked and less likely to help others. We all have selfish knee-jerk impulses, but it's what we do with them that counts. In a Yale University brain-scanning experiment published in *Psychological Science* in 2004, people who are staunchly anti-racist were shown pictures of people from other races. First their amygdalas lit up with primitive suspicion, then their higher regions inhibited this. In racist people, the higher cortex didn't kick in effectively. But in a world that constantly fires our base brain's prejudices with perceived competition and threat, we can be left so blitzed that our higher brains don't get a chance to act.

Lower cortex culture

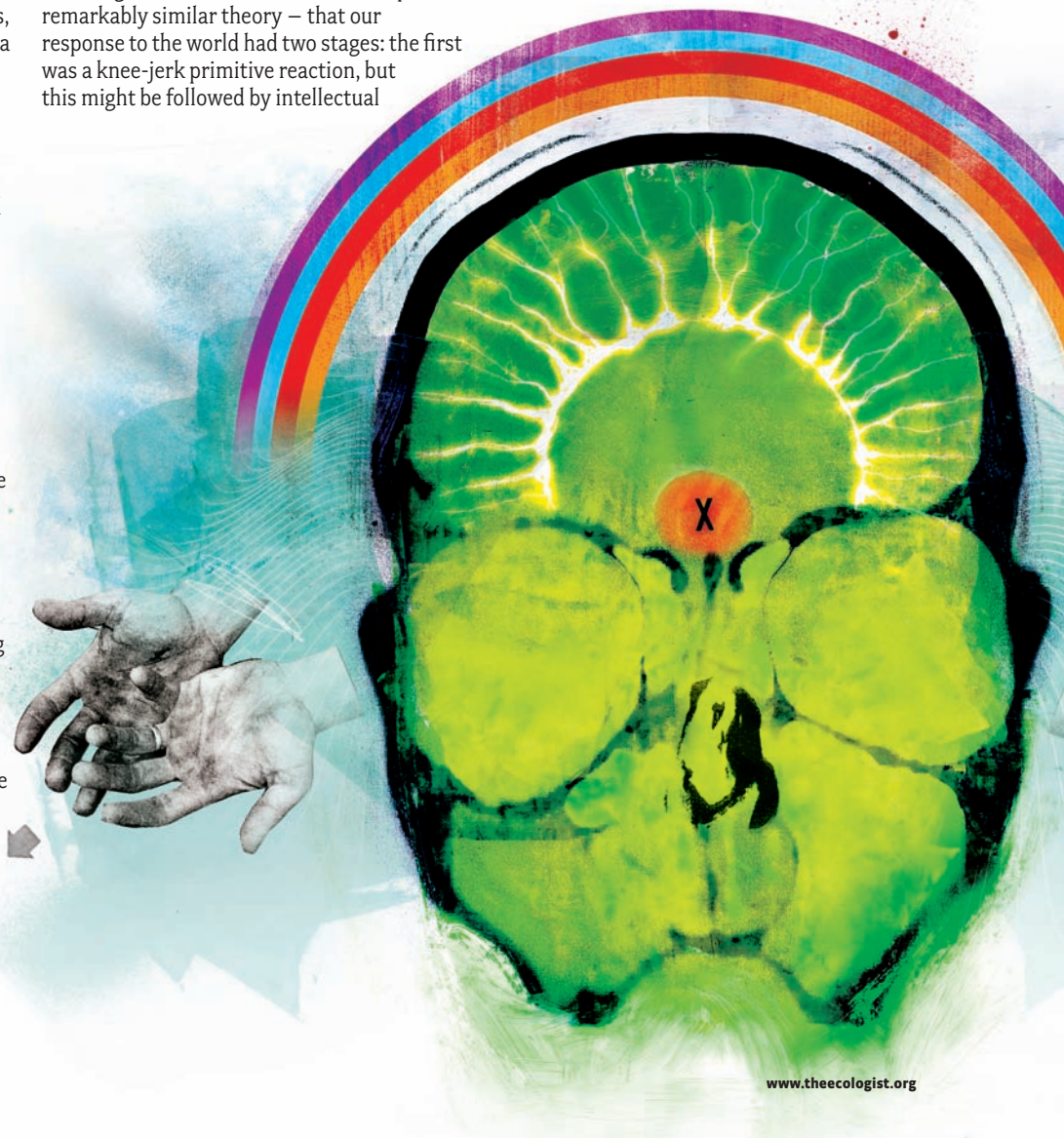
The challenge of giving our civilised brain regions better opportunities to bear influence is made harder by the fact that public debate on the subject has become mired in accusations of snobbery, amid phrases such as 'dumbing down' and 'intellectual elitism'. Hopefully, science may arm us with persuasively objective arguments for understanding how powerfully the culture we create configures the world between our ears. Increasing knowledge about our brains could enable us to become a neuro-literate society. But given the way we currently over stimulate our brain circuits, could we ever be wise enough to use that knowledge responsibly, to shift towards the altruistic, gratification-delayed policies that could make sustainable civilisation a reality?

It's a dizzyingly tall order. But history is punctuated by revolutions in human consciousness, such as the Renaissance, the

Enlightenment, Darwinism, the Industrial Revolution, Freudianism, the car and the internet – all products of our higher brain functions. By inventing the modern mass-consumer society, however, our clever cortexes have unwittingly led us into this low-brained crisis. The hope now is that we can harness our cortexes' potential to evolve our way out of it – not least by using high-tech communications and networking to begin fostering a more neuro-sensitive culture through lobbying, debate and community-building. As well as brain science, we may call upon a more venerable ally – the lessons of ancient culture. This idea of being able to train our minds out of their Stone Age short-term selfishness is thousands of years old. Long before Yale University tried brain-scanning non-racists, the Stoics developed a remarkably similar theory – that our response to the world had two stages: the first was a knee-jerk primitive reaction, but this might be followed by intellectual

reasoning, particularly if people were trained to think in this manner.

Breaking free of lower-cortex culture requires us to revive mental habits that are derided as naff by consumer society. A simple but profound example is the practice of gratitude. Our culture actively makes us habitual ingrates, fixated on all the things that we don't already possess. Consumerism conditions us to pin our sense of purpose on to pursuing the next thing, getting a brief thrill out of its acquisition, then dropping it as 'so yesterday' and chasing the next hit. When our soul's well of thanks is boarded over like this, we lose our delight in the abundance around us. The Roman emperor and Stoic, Marcus Aurelius, cautions in his *Meditations*: 'Do not indulge in dreams of having what you have not, but reckon up the chief of the blessings you possess and thankfully remember how you would crave them if they were not yours.' Modern research shows how fostering gratitude can boost well-being, lower materialism and create social glue. A report in the *Journal of Personality and Social Psychology* (2003) shows that raised levels of



gratitude lower levels of materialism, as people's over stimulated 'want' urges diminish. The study by the University of California, Davis, encouraged hundreds of people to keep a daily record of things for which they felt grateful. It found that they entered a beneficent cycle of kindness: being on alert for other people's good acts made them willing to reciprocate generosity.

This sense of social connection is eroded by consumer society's habit of encouraging a primitive mass-mindset where we see ourselves as alienated competitors in a climate of scarcity. We are thus robbed of the sort of generous human interaction that can nourish our neurons in delightful and surprising ways. Scientists who scanned people's heads as they donated to charities report in the *Proceedings of the National Academy of Sciences* (Oct 2006) that giving money lights up the brain's reward system in the very same way that receiving money does. Another study, in the journal *Science* (June 2007), watched women's brains as they gave \$100 to a food bank. It found that two brain regions – the caudate nucleus and the nucleus accumbens – fired when they saw the charity get the cash. These regions also fire when needs such as food and friendship are satisfied. As far as our higher brains may be concerned, what you give is what you get.

The idea that doing good benefits the doer may be as old as philosophy itself. Plato calculated that the charitable man is 729 times more joyful than the unvirtuous. More scientifically, a 1999 study of 2,500 men, published in the *Journals of Gerontology*, found that those who did no volunteer work were more than twice as likely to die over a 10-year period than men who volunteered their services. The sense of purpose we reap from helping our fellows may promote robust health. There are evolutionary reasons for believing that generous impulses are wired

into our neocortexes: Charles Darwin suggested that we overtook rival species when our higher social brains grew to think beyond survival-of-the-fittest individualism and learnt instead to act for the collective tribal advantage.

Rampant social competition not only denies many Westerners these higher pleasures, it also bars them from attaining the very contentment they think should result from constant material acquisition. Rushing through life quashes our ability to lose our neurotic questing selves amid the eternal now. This ability is a process called flow – a mildly euphoric state that occurs when we are so engrossed in a task that our maundering internal monologue tunes out. Flow, says Mike Csikszentmihalyi, the Chicago University psychologist who pioneered studies of this brain state, results from engaging in slow-burn experiences such as learning to play the piano or reading poetry. Sadly, perhaps, piano-playing and poetry-reading have largely gone the way of spinning tops and shove ha'penny. Although they help to develop our higher-functioning cerebral cortexes, these activities can't be sped up.

Raise the brain game

It takes persistence to pursue the plain old hard-work paths to higher-brained contentment. As soon as the going gets tough, we are nowadays encouraged to switch to something more rapidly gratifying. Our convenience-fixated society sticks up a sign saying 'don't go there', and diverts us to distractions that offer fast, low-brained fun. But if we don't persist, then our heads don't shift, then there's no hope for real cultural change. We have to raise our brain game. Not least because working to create a truly sustainable culture – one where we consciously restrain our material gratification out of concern for future planet-dwellers – demands robust higher-cortex intelligence, as a new study in *Psychological Science* (Sept 2008) shows. Yale University psychologists studied 103 healthy adults' ability to delay self-gratification while their brains were being scanned. Their results show that the best gratification-delayers scored highest on intelligence tests and had the greatest level of activation in the brain's anterior pre-frontal cortex. The research says that greater activity in this area helps people to manage complex problems, which fosters better self-control.

This effect may also make the credit-crunch

particularly challenging for sustainability campaigners. As Daniel Gardner points out in *The Science of Fear* (2008), come crunch time our instincts tend to override our considered thoughts, even when protecting our planet. In August 2007, 15 per cent of Britons polled by Mori put the environment in their top three concerns. A year later, that figure had dropped by a third to 10 per cent. Andrew Cooper, the director of the research company, Populus, says, 'There is a direct correlation between how people perceive the economy and the importance they place on the environment. When times are tough, people resent paying more to salve their consciences.' This is hardly about conscience-salving, but when people believe their immediate interests are threatened, they go into low-brained 'me now' mode, rather than focus on higher-brained sustainable strategies that may address the threat facing their grandchildren.

How do we precipitate change? One way is to co-opt a trick beloved of the marketing men – to play on our low-brained desperation to be one of the in-crowd. As a culture, we need to radically change our icons of the good life, to value different emblems of cool – higher-brained ones such as time, balance and autonomy, rather than trinkets. There are historical precedents: in 18th-century Europe, frugal living was considered a hip lifestyle choice: outside royal courts, luxury goods were often spurned, thanks to the practice of 'worldly asceticism', a Calvinist idea that offered the hope of heavenly salvation through diligent use of God's gifts (aka planet Earth). Puritans and Quakers promoted the ideal of 'Christianity writ plain', where it was considered good to produce, but bad to consume more than necessary. Those who lived luxuriously were criticised for squandering resources that might support society.

In order to make ecological policies sustainably attractive, we have to return to those types of cultural ideal (though this time, with scientific underpinning). In the process, we will have to raise taboos about the future purpose of humankind – not least, the question: how should we materially affluent westerners fill our time meaningfully, if we don't occupy it with getting and spending? Our culture blocks our ears to this quandary pushing us to go out earning and spending ever more. But to change direction radically, we must discuss the alternatives and debate how we can train our brains to promote truly sustainable habits. There is much to address. And the time for discussion grows shorter. But thanks to our lower-brain-driving culture, the debate has not even begun.

John Naish is the author of *Enough, breaking free from the world of more*, (Hodder & Stoughton, £7.99)

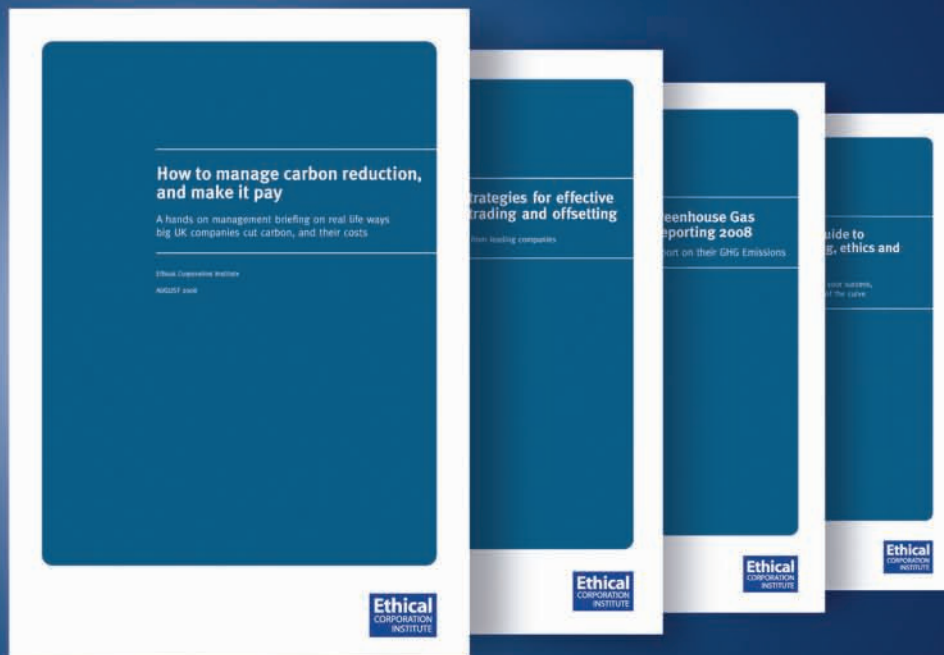


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Want to do something to help? Get involved with these campaigns

>> My Space? Our Space!

The British Trust for Conservation Volunteers' (BTCV) programme 'My Space? Our Space!' has been shortlisted for an award for its work with excluded young people in environmental projects.

The two-year programme has involved groups of teenagers and young asylum seekers revitalising woodlands, growing plants and undertaking permaculture work. One project focussed on removing rhododendron bushes from a woodland to encourage the growth of native oak and hazel.

Its successes have been recognised with nomination for a Young Partners Award, run by the National Council for Voluntary Youth Services.

More at <http://www2.btcv.org.uk/display/space>

FORGOTTEN TECHNOLOGIES

Did you or someone you know work on a worthwhile research project whose funding was suddenly cut short for no good reason? If so, you may have a rare chance to pick up where you left off.

Green consultancy Oakdene Hollins is offering £4,000 in consultancy support for the best 'forgotten' idea that could benefit the environment. Previous results from the Government's Sustainable Technologies Initiative programme have led to the rediscovery of lime mortars for replacing cement in buildings, and fabrics made from nettles – a technique used by Germany during the First World War.

For more information on this scheme, visit <http://www.oakdenehollins.co.uk/sustainability-competition.html>

>> Three Tonne Club

If you ended a new diet tipping the scales at three tonnes, you'd probably feel a little cheated. But not if the weight in question was your carbon footprint, and the diet prescribed by the Women's Environmental Network's new Three Tonne Club.

We've seen plenty of online carbon calculators for working out your footprint, as well as plenty of recommendations as to how you can bring it down. What the WEN does is combine the two. So there's a social, supportive side provided by weekly meetings at which members compare their weight and offer tips and support. And there's also an extremely well-researched and -produced booklet – the *Three Tonne Club Handbook* – which not only guides you through climate change and carbon footprint basics, but also includes simple calculation sheets to fill in to work out your biggest sources of greenhouse gases.

The booklet is far more comprehensive than most web calculators, even calculating the reductions to your footprint arising from a 30 per cent, 50 per cent or 100 per cent organic diet. You won't find that on the Defra website!

Comprehensive, clear, but never patronising, the booklet is packed with tips for how to reduce your footprint which go well beyond the usual lightbulb-swapping platitudes.

It costs £3.50 including postage and packing, but is free to new members joining the worthwhile WEN. See <http://www.wen.org.uk>

ECO MINDS

Do you know of, or work for, an environmental project that involves people with experience of mental distress? If so, they should apply for funding from the Big Lottery Fund's new Ecominds programme.

The programme is based on the well-established finding that physical activity outdoors lifts mood, improves physical and mental well-being and can help people connect with others.

For more information, visit www.ecominds.org.uk

>> Shout it out

Celebrating November's Climate Change Bill isn't just for eco-geeks and policy wonks. Kids can too, especially if they're part of Friends of the Earth's 'Shout About' initiative, which centres around an activity week taking place between 2-5 March.

Participating schools receive information sheets, video and web resources as well curriculum-linked activities and lesson plans. The week will include ideas on how to shrink carbon footprints in line with the 80 per cent cut we've all now signed up to. Visit http://www.foe.co.uk/learning/educators/shout_about

>> **First post** While the Government wrings its hands over the future of the Post Office, six community run shops and two social enterprises have been nominated for a national award. The shops, from Cumbria to Devon, have been shortlisted in the 'Best Village Shop and Post Office' category of the Countryside Alliance Awards. Two social enterprises – a Cumbria bakery and Lancashire farm shop – have been shortlisted in additional categories. Winners will be announced on 18 March 2009. See: <http://www.countrysideallianceawards.co.uk>

Watt a

Everyone knows it's wasteful to leave things on stand-by. So the energy saving campaigns are wasting their breath telling us to switch off, right? So thought **Mark Anslow**, until he was leaving the office one evening and had a light bulb moment

turn off



I don't know about you, but, I'm getting sick of being told to switch things off stand-by.

My irritation is two-fold. First, because the agencies telling you to do so are usually either the Government – which could do much to tackle its own carbon footprint – or the energy companies – which could do even more. And then secondly, and perhaps more importantly, I've been switching things off at the plug at home for years now – and so, I'm sure, have lots of other people.

In fact, the Government's official energy statistics show a slight decline in domestic electricity usage since 2005. This could well be a blip – a product of recent warm weather (meaning less energy used for heating) or a shift towards quick microwave heating of ready meals, rather than full-blown home cooking. And indeed, estimates by the Building Research Establishment suggest that overall, energy use on appliances is still going up. But on the other hand, the fact that we've been busy buying energy-hungry plasma TVs but haven't seen a massive leap in domestic electricity consumption could suggest that the endless messages encouraging us to swap light bulbs, boil less water in the kettle and switch appliances off stand-by might just finally be getting through.

So is it time for the Energy Savings Trust and the energy firms to start doing more productive things with their advertising budgets? Perhaps not quite yet. For while our domestic energy use may be showing the right signs, there's a whole other domain outside our homes where most of us haven't started paying the blindest bit of notice to energy efficiency. Yes, it's the workplace.

Whereas our use of electricity at home has declined by roughly 1.5 per cent since 2005, our use of electricity in offices, for example, has risen by about 14 per cent. A recent report by the consultancy firm McKinsey & Co concluded that the office is becoming a major driver of climate change, with the energy required to power the world's computers and IT infrastructure set to double by 2020. And there's also good research to show that most of us leave our carefully honed eco-credentials firmly at home when we set out to work. A survey published by Government body Envirowise in September last year discovered that one third of UK office workers took no action to reduce the amount of resources they used during the working day, and concluded that if managers showed their staff the utility bills, it might encourage them to think twice.

Until that becomes common practice, however, many of us spend our working days

in a world of over-lit rooms filled with ceaseless screen-savers playing on unblinking monitors, with everything kept at a nice comfortable 21 °C.

A costly realisation

Now you might expect the *Ecologist* offices to be pretty green. And, to be fair, we have made efforts: most of our furniture is recycled or reclaimed; we recycle and compost; we use low-energy light-bulbs and have organic fruit and veg delivered.

We do okay, I thought. But shutting down my computer a few weeks back, a thought occurred to me – what if 'off' didn't actually mean 'off'? Might the computers in the office be drawing some power from the mains even when they were totally shutdown?

There was only one thing for it. Using a wattage meter which has allowed me to bore friends and family with energy statistics for years, I checked how much electricity our Apple iMacs used when switched off. I got a shock: more than 12 watts. Equivalent, in other words, to running a bright energy efficient light bulb.

Looking around the office, I realised that the same must be true of much of the other equipment in the room. We have seven iMacs, drawing more than 85 watts when off. A few PCs and their monitors – another 50 watts. An older Mac – 22 watts. How about the high

powered machine used by our art director? A staggering 50 watts alone. And the printers (which were sometimes switched off, but frequently left to 'sleep')? 44 watts.

All told, an office about which I have previously felt rather smug was drawing nearly 290 watts of power, at a time when most of us had assumed everything was switched off.

To put this number into perspective, I worked out how long the office was unoccupied – about 14 hours a day – and multiplied this by the power demand. We were, I discovered, using just over four kilowatt hours (kWh) of energy every evening, or a vast 1,482 kWh every year.

In reality, it was costing us nearly £240 a year, producing well above half a tonne of CO₂, and was the energy equivalent of boiling our kettle, non-stop for a month.

Something had to be done. The simplest action, of course, would have been to tell people to switch off their computers at the plug every night. But thinking this through, I realised it wasn't going to be that simple. For a start, many members of staff shared plugs or extension boards, making isolating their own machines tricky. More importantly, many of the sockets were pretty inaccessible, even to the more nimble among us.

It was one of those situations, I decided, which justified a gadget. The gadget, in this case, came in the form of the popular Bye Bye Stand-by 'office kit'. This allows you to remotely cut power to several electrical devices that are in stand-by mode. The kit contains four power blocks, which will turn off four sets of devices and one remote control. Plug the power blocks between the appliance and the wall socket and using the remote control, you can switch all the appliances in the office fully off from one central point. In our case, it went by the door, so that people could press it on the way out.

For those who might be worried about introducing another radio signal into the house – don't be. The transmitter unit only emits a signal when you press the button, and does so at an extremely low power level. In fact, those who are sensitive to electromagnetic fields have more to fear from the computer unit itself than from such a device.

The moral of the tale? There are two really. The first is not to make my mistake and leave your energy conscious behaviours at home when you set out to work. And the second? Never believe a computer when it tells you it is off – the chances are it isn't. The stand-by problem hasn't gone away – it has simply shifted ground and become harder to spot.

Mark Anslow is the *Ecologist's* News Editor

It pays to push the button:

CO₂ saved:

637 kg

Money saved:

£240 (approx)

(dependant on electricity price)

Cost of Bye Bye Stand-by

£99.96 (8 units)

Financial payback time: 5 months

What else might be left on stand-by without me realising?

TV

Set-top box

Cooker

Microwave

Washing machine

Broadband modem/router



Local Hero: Richard Simpson

Brighton and Hove Wood Recycling Project

Mel Poluck visits a flagship environmental project that rescues, reuses and recycles tonnes of wood destined for landfills, doing much the same for those it employs

As more of us rightly bow to pressure to reuse, recycle and save energy in our homes, it is worth reminding ourselves that householders account for just nine per cent of the UK's waste. The construction industry, however, accounts for approximately a third. Some 10 million tonnes of waste wood are produced in the UK each year according to the Department for the Environment, Food and Rural Affairs (Defra). Meanwhile, the Brighton and Hove Wood

Recycling Project has for the last decade, been steadily tackling this huge source of waste wood. The not-for-profit initiative collects discarded timber mainly from building sites, receives a fee for collection then it sells on what it collects.

Piled floor to ceiling with timber, 'the wood-yard,' as it is affectionately known, is nestled between Brighton's now defunct fruit and vegetable wholesale market and the art faculty of the University of Brighton, a stone's throw from Brighton beach. Laboratory

tables, telegraph poles, timber from the defunct Brighton pier, stage sets, beams from demolished and renovated Victorian hotels and joists from English Heritage sites all find their way through the project's gates.

On a typical day, the place is abuzz with customers including home improvers searching for that coveted "rustic" shelving, project DIYers, tradesmen, or students enquiring about the timber they need, or poking around timber stockpiles. 'My loyal customers say they love coming here and

having a rummage,' says co-founder and managing director Richard Simpson.

The project has grown from humble beginnings. One day back in 1998, Simpson's friend Richard Mehmed found himself at a packaging company and was shocked to stumble upon heaps of waste wood which, he found out, was going to landfill. As a Green Party member and becoming increasingly dissatisfied with his day job, the prospect of trying something new that would confront this waste problem became increasingly appealing. Mehmed approached Simpson with the idea of starting a community recycling project.

'I was working as a freelance architect. I was bored in my job,' says Simpson, over the sound of drills and electric planers as staff sand down and remove nails and paint from salvaged wood in preparation for its coming incarnations. 'I thought I could use my knowledge of design. When I first started [with the project] I thought, when am I going to get a proper job? Now it is my life,' he says.

Until the day that the duo made the momentous decision to give it a go – with £7,000 of investment from Mehmed's pocket and no experience of setting up a community initiative – there was no service in the country that collected waste wood from building sites for re-use. The pair began networking with voluntary and community groups, construction companies and the council to discover what was being done to tackle excess waste wood locally.

'When you start, you haven't got a clue,' says Simpson. The sustainability team at Brighton and Hove City Council helped them find a rent-free site in a park from which to base the project and with the help of volunteers, they built two polytunnels in which to store wood, running electricity to a shed which served as the rudimentary office. It may not have been much, but the base 'put the project on the map' according to Simpson.

Starting blocks

But scouring Brighton's skips for discarded timber became increasingly difficult, partly because it turned out there was glut of waste wood across the city and partly because they were using a clapped-out camper van to transport their stock. 'We had to start charging companies to take their waste away, otherwise it wasn't a viable business model,' says Simpson. The project began to charge for collection, undercutting skip hire companies, as it continues to do today.

After approaching several local companies for sponsorship, Simpson and Mehmed came to an agreement with a local building firm: in return for the use of a large, efficient van, they would collect the company's waste wood. For the first time, money was coming in.

Simpson looks back on the challenges of those early days. 'One big hurdle was convincing building companies not to chuck everything into a skip, but to separate waste,' he says. Although he would first approach the company director when arranging collections, the trick to salvaging waste wood from construction sites was to 'win over the foreman,' Simpson says. This is an ongoing

'One big hurdle was convincing building companies not to chuck everything into a skip, but to separate waste'



challenge. 'They are commercial and we are a community project. They see us as a bit rough around the edges,' he explains.

To answer the call, the project issues certificates to building companies every quarter declaring how much waste wood they have saved in both weight and financial terms. It is a simple incentive. 'We've started to see a big difference,' he says.

Simpson says they have received relatively little in the way of grants during its lifespan ('Often we didn't fit the criteria'), but a real turning point was when it was awarded a £5,000 grant, promptly spent on buying a decent vehicle and employing two full-time staff. Ten years later, the Brighton and Hove Wood Recycling Project has six full-time staff and up to 10 volunteers.

Although not one of the original objectives of the initiative, creating and providing training and volunteering opportunities for local people has become a key tenet of the project. In particular, it helps those who might find it difficult to enter the jobs market because they lack skills, have a criminal record or mental illness, or have been long-term unemployed. Strong links with schools, the Government's Job Centre Plus, The Prince's Trust and probation offices ensure a steady stream of volunteers and staff. 'A lot of these people have since gone back to education or employment. It's a platform for people to move on in their life,' says Simpson.

While volunteers are a vital cog in the machine, 'an absolute asset,' they can pose their own challenges. Simpson is aware that he is 'relying on the good spirit of local people. Sometimes we've had to drag them out of bed in the morning.'

Last summer, the project certified its first 'graduate' from a pilot 13-week volunteers'



Richard Simpson co-founded the Brighton and Hove Wood Recycling Project, the first venture in the country to collect waste wood from building sites

PHOTOGRAPHY: PHIL FISK

Volunteer Richard Brady was on the project's training scheme for 13 weeks. The project helps many people who might otherwise be excluded from the jobs market to gain basic carpentry skills and improve their prospects



training course designed by Mehmed to instruct on tool handling, Health and Safety, administration and basic carpentry. The student, who was previously homeless, has since gone on to a part-time job and two more trainees joined the scheme in October. 'The course adds another string to our bow. It brings a lot of value – they'll benefit and the quality of work will improve. Everyone's a winner,' Simpson enthuses.

Grass-roots

Regardless of their background, project values are instilled in staff and volunteers from day one. What unites them all is the desire to reduce and re-use waste resources. 'We all feel something has got to be done about saving timber. Generally, it's not seen as a valuable asset like metal and glass,' says Simpson.

The net is cast wide, since local craftspeople also sell their products through the project, so the yard is often scattered with furniture and ornaments made from recycled wood. In addition, through word-of-mouth, it generates business for local tradesmen. Martin Cox, a carpenter who specialises in using reclaimed wood, says the project is an invaluable source of not only materials, but job leads too.

'I buy the majority of my timber from the woodyard,' says Cox. 'My clients love it, because the wood always has more character. There's a strong chance of good quality wood coming up, because the guys there are constantly collecting wood from all over. If one of my clients wants a hardwood kitchen worktop, they don't have to feel guilty that a tree has been chopped down just for them – and nor do I,' he says.

To date, the Brighton and Hove Wood Recycling Project has diverted some 6000 tonnes of waste wood from landfill, the equivalent weight of about 6000 cars. Simpson cites support from the local council as having bolstered the project immensely. 'We're seen as a real asset,' he says. And it's no wonder. It benefits the local authority by

How much wood the UK wastes

- As much as 10 million tonnes of waste wood is produced every year
- 420,000 tonnes of wood is discarded from households or dumped at civic waste amenities
- Up to 670,000 tonnes waste wood is produced from packaging
- Construction and demolition waste accounts for 750,000 tonnes

Source: the Forest Stewardship Council (FSC) www.fsc-uk.org

So you want to recycle or reuse waste wood?

To get hold of reclaimed wood near you, or to get rid of your own household waste wood, go to the National Community Wood Recycling Project website to see if you live near one of the 22 project sites in England, Scotland and Wales.

You can arrange collection of waste wood if you are a householder or a business by calling the local project. Rates vary. All contact details can be found at: www.communitywoodrecycling.org.uk/10therpj.htm

If you do not live near a Wood Recycling Project, try (WRAP – www.wrap.org.uk), the Waste and Resources Action Programme, a government body which helps individuals, businesses and local authorities make more efficient use of resources by reducing waste and recycling more. WRAP raises awareness and provides consultancy for materials including wood recycling and offers a wood recycling location finder as well as a resource for finding recycled goods. See: www.recyclewood.org.uk

enabling local targets for recycling to be met, boosting the local environmental reputation, helping people get off benefits and diverting waste from landfill, which ultimately saves councils money in the form of landfill tax.

In fact, it is likely to be the threat of rising landfill tax, set to peak at £48 per tonne by 2011, that will make construction companies take waste more seriously. Pressure on the construction industry is stepping up a gear. Companies can face high costs if they dispose of their waste as landfill and prosecution if they dispose of it illegally. Introduced last April by the Environment Agency, Site Waste Management Plans are now a requirement for construction projects in England worth more than £300,000. These aim to encourage designers to consider cutting waste as integral to projects and are updated from pre-construction to completion.

Since its humble beginnings a decade ago, the Brighton and Hove Wood Recycling Project has become a model for a community wood recycling network nationwide. Its co-

founder Richard Mehmed has gone on to help establish a remarkable 21 wood recycling projects in Cambridge, Glasgow, Llandudno, London and Manchester among others, using the original Brighton and Hove initiative as a template. These other projects save approximately 2800 tonnes of wood from going to landfill every year.

With some great achievements under its belt, including an award for the best national social enterprise from the former Department of Trade and Industry, the future also looks exciting. Simpson has plans to expand the staff team and start a line in recycled wood gifts and homeware. Organisers of large-scale events such as music festivals increasingly commission them to build furniture and structures from its recycled wood. They even helped create a green-themed garden for this year's Chelsea Flower Show.

Simpson cites a positive change in public perception of waste materials as a major boon. 'People don't see it as crap any more.'

But challenges remain. Since the project's inception, Simpson and his team have battled to find a suitable, permanent site. Today this need remains undiminished – the current base is soon to be sold for redevelopment.

Gathering fuel

In future there will be more demand for recycling initiatives such as the Brighton and Hove Wood Recycling Project, as virgin materials become increasingly scarce and expensive. 'The economic situation has meant we're being more resourceful. It's an opportunity for us to improve our infrastructure,' says Simpson. 'There may be a slowdown in the construction industry, but household waste is still on the increase.'

But anyone considering initiating a scheme would be wise not to take the task lightly. 'Each stage has been part of a massive learning curve,' Simpson reminisces. 'To most people, we were just a bunch of hippies, but we were the first initiative to go to commercial building sites in the country. We started to see the bigger picture,' says Simpson. 'But you have got to be so hungry for it. I've had to commit my life and soul. We've pulled it off with sheer guts and determination.'

www.woodrecycling.org.uk

Mel Poluck is a freelance journalist

'To most people, we were just a bunch of hippies. We've pulled it off with sheer guts and determination'



IT'S A PIG'S LIFE

Tracy Worcester's film *Pig Business* exposes the abuses of factory farming and challenges consumers to make a stand. **Phil Moore** meets a woman on a mission

Checking the labels on supermarket packets of pork at the beginning of her documentary, *Pig Business*, Tracy Worcester is clearly frustrated.

'If shoppers would only look behind the label in ways my documentary describes, they will see that by exercising their consumer power they can protect our independent farmers. Our farmers would then improve their standards to produce human, animal and environmentally friendly pork.'

The recent recalling of contaminated pork from the Irish republic exemplifies the problems of mass produced meat, where one mistake can mean that millions of tonnes of pork has to be thrown away. Such scenes remind us of the dangers of factory farming and the burning of cattle in the BSE crisis.

Tracy Louise Ward, Marchioness of Worcester, has been campaigning on environmental issues since 1989. From her early days of sealing envelopes for Friends of the Earth, to an active role in the environmental movement as a public speaker and associate director of the International Society for Ecology and Culture and trustee of the Gaia foundation, Tracy has most recently been putting her energies into film making.

Pig Business, is a powerful critique of intensive farming; the animal cruelty, environmental degradation and the dangers

posed to human health and livelihood. Focusing her sights on Smithfield Foods of America, the world's largest pork producers, her documentary reveals the dark side of the intensive pig farming regime that puts cheap pork on our tables.

Four years in the making, *Pig Business* brings together important issues in the environmental movement as well as themes

Join the campaign

Pig Business – **More4 February 3, 10pm** – is more than a film, it's a campaign and Tracy Worcester wants everyone to use their consumer power to push for change. Here's how to have an affect:

- AVOID factory farmed pork
 - BUY from farmers markets or buy British – preferably organic – in the supermarket
 - CAMPAIGN against cruel farming methods
 - DEMAND action against imports of pig meat raised below UK welfare standards
 - EAT less meat, but of better quality
- The campaign is supported by the Gaia foundation and many more organisations. After its TV broadcast, the film will be screened in small venues across the country with Tracy attending as many as possible for Q&A sessions.

For more details, log onto the *Pig Business* campaign website at www.pigbusiness.co.uk

central to the campaigner's own life: 'I've been in the ecologist movement for 20 years and if we deal with each separate issue it's like shifting all the chairs on the Titanic. What are the root causes? And I wondered what would appeal to the general public in communicating the work I had been doing.'

Tracy first learnt of Smithfield's invasion of Poland's pork industry in 2002, having met Tom Garret, consultant for rural affairs, for the US based Animal Welfare Institute and long standing campaigner against intensive livestock production.

Smithfield's first acquisition in Poland was the former state-owned farm Animex, followed by 21 other state-owned farms. As Smithfield's operations grow, farmers who use traditional feed and natural rearing methods without the use of additives become uncompetitive and are forced out of farming.

'The story of Smithfield encapsulated so many areas of interest: corporate takeover, EU bureaucracy and subsidies, the threat to small-scale farmers, the dignity of work and the quality of food.'

Smithfield 'processes' 27 million pigs a year, operates in 15 countries and has annual sales of almost \$12bn dollars. The late 1990s saw the introduction of Smithfield into Poland, along with its approach to intensive hog farming.

The dangers of dumped and untreated pig faeces to ecosystems, the hazards to workers' health and those living near to Smithfield's farms are vividly recounted in the film.

Being an advocate of small-scale farming provided a strong motivation for Tracy to follow the story: 'Farming and seeing it being destroyed in every country I go to is so upsetting. I thought here is an extraordinary story, where my taxpaying money, through the European Bank for Reconstruction and Development (EBDR), is going to fund the industrialisation of farming destroying the farmers of Poland and England.'

A powerful indictment of industrial farming, *Pig Business* gives many reasons to get angry, but it won't leave it there. Working with a host of campaigns, NGOs and other groups, *Pig Business* promises to act as the driving force behind those seeking to resist the perils of industrial farming.

Phil Moore is the *Ecologist's* newsletter editor



Tracy Worcester's *Pig Business* tells an 'extraordinary story'

FREE TREE
dedicated in your name when you join

We're creating the largest new forest in England....

You can help by becoming a member of the Woodland Trust

In 12 years time 850 acres of bare land near Sandridge in Hertfordshire will have become Heartwood Forest – the biggest new native woodland created in England since the last Ice Age. Just 12 years – that's the surprisingly short time it takes for newly planted saplings to develop into a flourishing forest supporting a wealth of wildlife.

This country's need for new woodland is urgent. The UK is one of the least wooded places in Europe – our woodland heritage and precious greenbelt can all too easily be lost to development.

By becoming a valued member of the Woodland Trust for just £2.75 a month, you will not only be helping ambitious projects such as Heartwood Forest – you'll also help us add to the 50,000 acres of woodland already under our care and protection, the 9 million trees we have already planted and allow us to fight to protect threatened woods throughout the UK.

For further details of Woodland Trust membership call 0800 026 9650 (quoting ref. ECO) or visit www.woodlandtrustshop.com/jointoday

For most of us a walk in a forest goes by in a kind of green blur, but as **Tom Wessels** reveals, knowing what you are looking at can unravel complex stories etched into our forested landscape, fostering a sense of place that promotes future stewardship

FOREST FORENSICS

As a terrestrial ecologist, I am something of a generalist. My interests lie in forest, desert, and alpine ecosystems, yet people who know of my work would most likely say that reading the landscape is my speciality.

Reading a forested landscape might be more accurately termed 'forest forensics' since it is similar to gleaning evidence from a crime scene to try to piece together exactly what happened in the past.

With careful observation it is possible to separate former pastures from crop fields, from hay fields and wood lots. It can be inferred if trees have been blown down by a storm and the type of storm responsible. Fire and logging leave clear evidence of their former presence. Plus all of these events can be roughly dated solely from the visible evidence left on site. All these features offer wonderful evidence for unravelling detailed forest histories if one knows how to interpret them.

Being able to understand what a landscape is telling you, is important when trying to reconstruct the history of a place, to pin down an archeological or cultural story. But it can also be an engaging mystery-solving activity – one that can help forge a much stronger connection to a place.

I often find that when I am walking through the woods I am in dialogue with the forest. As I walk, I encounter an abrupt change in canopy composition or structure. I immediately ask why and start gleaning the site for evidence. When I find evidence that either supports or rejects my original hypothesis, the forest is answering my question.

It was in this capacity during the spring of

2006, that I was asked to help interpret the agricultural history of a now wooded parcel of land in the Green Mountain National Forest of Vermont in the United States. I was a member of a seven person archeological team that was trying to puzzle out some very unusual stonework found on the site.

Piecing together the jigsaw

I had been told by the archeologists before getting there that this stonework consisted of dozens of large, flat-topped – for lack of a better word – 'cairns' that seemed to have no logical purpose unless they were in some way related to the site's past agricultural use. Since the stonework was unique and on federal lands, the decision had been made not to disturb the area with a standard dig. Had a standard dig revealed an intact soil profile under a cairn, it would prove they predated the cultivation of the site and would have to be assumed to be of Native American origin. Without digging them up there was no way to tell if the cairns were related to the site's past agricultural use and I would need instead to infer the site's history solely from visible evidence (see story, p 44).

To the uninitiated, a walk in a forest can be

'Once we understand the history of our landscape, the stronger and deeper our connection will grow. We see that we are truly a part of it'



like travelling through another dimension – a beautiful background that engages us by its presence. In a way, the experience is similar to meeting someone we're attracted to. We are drawn to that person but have no intimate connection to them.

Reading a forested landscape allows us to develop a deep level of intimacy with our place. Just as we need to know their history, and what experiences have moulded those we love in order to build deeper relationships, so it is with the places we inhabit. Once we come to understand the history of our landscape, the forces that have shaped it through time, the fascinating stories it has to tell if we only know how to see them, the stronger and deeper our connection will grow. This deepening relationship can bring us to a point where we no longer have the false sense that we are somehow apart from the landscape. We start to see that truly we are a part of it.

Evidence suggests that our species, modern *Homo sapiens*, has been on this planet for at least 150,000 years. For more than 95 per cent



Unusual stone work in the Green Mountain National Forest of Vermont fascinated archaeologists, but a decision was made not to do a dig

of that time, all generations of people existed in hunting-gathering cultures. Critical to a fulfilled experience of life for people in those cultures were intimate connections to their community, intimate connections to their place, traditions that further linked a people to its place through stories, rituals, and festivals, and finally ample time for reflective practice provided through the arts, contemplation, even prayer that allowed knowledge to be converted into understanding, and eventually wisdom.

Knowledge and understanding are often used interchangeably, yet they are very different. Knowledge is having mastery of factual information, the stuff that we test for in objective exams. It is strictly a mental phenomenon. Understanding, however, is being able to comprehend the implications of knowledge. It involves not just the mind, but also the body and emotions. It can be pictured as the aha! moment of a light bulb going on over someone's head in a cartoon. Looking closely at the character in the cartoon, you



PHOTOGRAPHY: TOM WESSELS

Watching the detective: forest forensics in action

We walked around the Forest Service gate to a woods road that cut across the slope. I started to examine the ground on both sides of the road. Whenever I am working to interpret a forest's past agricultural history in New England, I always start by looking at the ground. I am not looking at the vegetative cover or the nature of the forest litter, just simply the micro-topography of the ground itself. As I looked uphill from the road, I could see large pits and mounds, or what I prefer to call pillows and cradles. These features told me that live trees had been toppled there in the past by either wind or snow and ice loading.

When a live tree falls in a forest, its roots rip out of the ground excavating a pit, or cradle. The roots, now sticking up into the air, hold the earth removed from the cradle. Through time, as the roots decay, the excavated earth is dropped as a mound or pillow. Once formed, the live roots of surrounding trees invade the pillow and cradle stabilising them. Large pillows and cradles in New England can be visible almost a millennium after a tree-topple. Since the pillows and cradles on this side of the road were quite large and didn't appear to be worn down by the hooves of livestock, I began to think that this area had always been forested and never opened for any agricultural use.

As we proceeded on the woods road, the ground down-slope, where the cairns were, quickly changed. Although sloping moderately, the ground on this side was smooth and even – a clear sign that this area had been ploughed in the past, removing its pillows and cradles. Since there was no stone or wire fencing along the once ploughed side of the road, I had evidence to confirm that the uphill side was always forested and not pastured.

In New England, land was ploughed for two reasons, either to create hay fields or crop fields. In the case of a hay field, it would need to be ploughed – to remove the pillows and cradles that would get in the way of working a scythe – and then seeded. Hay fields were generally ploughed just a few times. Crop fields however were ploughed every year before planting. As I wandered down into the ploughed area, I started moving across the slope to see if I would come to a stone wall, knowing that a wall would hold the evidence to confirm if the site was originally a hay field or crop field.

From deep inside the earth

Most of this region is covered in glacial till – a jumble of material from fist-sized particles all the way up to large boulders. In soils that support perennial plants, the roots of trees, shrubs, even grasses stitch everything in the soil together as a unit so when the ground freezes and expands in the winter and then thaws and settles in the spring, rocks remain fixed in place. However, in cultivated sites that lack perennial roots, rocks can be moved up and out as the soil begins to thaw.

Most people don't know that when the spring thaw begins, it moves from the bottom up, not from the top down. Below the frost zone the ground temperature is 50° F all year

round, creating a large reservoir of heat. As the winter abates and the cold can't get as far into the ground, the thaw moves upward collapsing the pocket where the rock originally resided. When the thaw reaches and releases the rock, it can't return to its original position. In this way, rocks are slowly ferried to the surface through repeated freeze and thaw cycles. When a rock, even the size of a fist, surfaces, it will be removed from the crop field to ease working the soil. Rocks don't surface in hay fields or woodlands because the roots lock them into place.

Eventually I did come to a wall. It was about two meters wide with large rocks framing it outside and small rocks filling the inside. Stonewalls built solely around hay fields in New England are generally not very wide and constructed with only large rocks. The wall in front of me was clear evidence that annual ploughing had occurred here.

Having figured out that the area holding the cairns had once been a crop field, I was ready to examine the stone structures themselves to see if they meshed with the site's cultivated past. I turned from the wall back toward the centre of the site where I encountered a cluster of cairns. I was struck by their size and the quality of stonework.

The largest ones measured about seven by 10 meters in width and length. The external

walls were carefully built and then filled with rock inside to create structures that had horizontal flat tops. The down-slope walls of the cairns were sometimes close to three metres high with the top-slope walls being built to a height of one to two meters. Because of the cairns in this once cultivated site, the sheer amount of rock that they held, plus the nature of their construction made me think that they weren't related to the parcel's past cultivation.

The amount of rock in the cairns and the surrounding walls, however, was far beyond the volume I had ever seen in a New England crop field of this size, suggesting that much of it may have been imported. The construction of the cairns also made little utilitarian sense could imagine that if a crop field generated a large amount of rock that cairns like these might be made to hold those stones, but their top-slope walls would have made getting rid of all that rock much more labour intensive than just dumping it into an expanding cairn.

In this case, reading the forested landscape answered some questions about its history, but also raised a few more. Why were they built? Are they burial mounds? Do they have calendar significance such as the standing stones at Stonehenge? Do they have ritualistic significance? As yet, we don't know.





The purpose of the cairns remains obscure, but one thing that's for sure is that they were labour-intensive to build



would notice that they have a smile on their face, that their eyes have widened, and that their chest is inflated. Understanding can also occur at deeper levels such as epiphany or revelation.

Reading the forested landscape can help forge an understanding of place. It can generate those aha! experiences that open

A walk in the forest...

- Find forests and woods to walk in near you on The Forestry Commission website which has details of walks and trails, how to get there, the grade and length of the trail and what to look out for such as ancient monuments and hill farm ruins. www.forestry.gov.uk
- The Woodland Trust cares for more than 1,000 woods. Access is free; membership includes a directory of their woods www.woodland-trust.org.uk
- Some of Britain's most beautiful locations including forests, woods and nature reserves are managed by the The National Trust. They have a 'Great Walking' section on their website www.nationaltrust.org.uk
- Experience the diverse landscapes of the UK by visiting a National Park – there are 9 in England, 3 in Wales and 2 in Scotland www.nationalparks.gov.uk
- Join The Ramblers Association who have around 500 groups in England, Scotland and Wales, organised into around 50 areas. www.ramblers.org.uk
- Buy ordnance survey maps online at www.ordnancesurvey.co.uk

our eyes and bring us in. I can't comprehend the depth of the connection that hunting-gathering peoples had with their landscapes, but I do know that through reading forests, I continue to deepen mine.

I believe we are hard-wired to need these kinds of connections in order to have a rich and full experience of life. Yet as our human culture has evolved, we have witnessed a continued erosion of strong connections to community, place, and ourselves through reduced time for reflective practice. In the United States, the average individual changes addresses every 3.6 years. How is it possible to make meaningful connections to community or place when people move so frequently?

With the expanding digital age, we are exposed to ever more information with ever less time to process it and to develop understanding – a trend that I believe is not good for personal well-being. Whereas too much unprocessed knowledge can be deadening, understanding always generates a fulfilling experience. Developing understanding is why we like to learn. We need to find ways to re-forge our connections to the land. Reading the forested landscape is one way to begin to reclaim a strong and vibrant connection to place.

Tom Wessels is a terrestrial ecologist and a professor at the Dept of Environmental Studies, Antioch University, New England. He is the author of three books and is an active environmentalist.

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DAILY LIFE

Enjoy the snowdrop season; swap seeds; help birds nest; choose Fairtrade; go guerilla bagging.

By Laura Sevier

FEBRUARY

Spotlight on...

Mend it yourself

Sewing on a button: An activity of times past or a necessary skill set we all should have? Consider this: Clothing prices have dropped a third in 10 years, we are busier than ever before and repair skills may no longer be taught in schools. All of which has led to many of us to consign clothing repair to parents or grandparents – or even worse – just binning clothes that need repair.

Tailors and other clothes mending services can be pricey, but for about £5 you can prolong the life of garments over seasons, or years with a simple sewing kit.

Many of the most common clothing repair activities, such as darning socks and mending rips can be done at home with a few simple sewing tools such as a selection of threads, needles, buttons, pins, a needle threader and scissors.

Spending more of our clothing budgets on fewer, but higher quality clothes that are made to last makes it economical in the long run to mend them yourself or have someone mend or repair them for you...



Don't know how to start?

Watch these quick videos on YouTube:

'How to sew a button' -
http://uk.youtube.com/watch?v=74660I_oQF4
 'How to darn a sock' -
<http://uk.youtube.com/watch?v=4nY1jTVyBE0>

3 THINGS TO DO...

Do Get some fresh air, blow away the winter cobwebs and explore the UK's many woodlands and forests... (see page 45)

Join Edenbee is a green social networking site for people who want to reduce their carbon footprint. Swap ideas, share your experience or read their blog with the latest news. www.edenbee.com

Precycle Precycling (reducing packaging waste) is the new recycling. Now there's a book, *Precycle!*, by Paul Peacock (£7.95, The Good Life Press) that shows you how to make the things you need, rather than buying them pre-packaged – from baked beans to bathroom cleaner. www.precycle-it.co.uk



**MAKE IT HAPPEN
CHOOSE FAIRTRADE**



23 Feb - 8 Mar

Fairtrade Fortnight

Two billion people – a third of humanity – still survive on less than \$2 a day. Unfair trade rules keep them in poverty, but they face the global challenges of food shortages and climate change too. Fairtrade can help tip the balance of trade in favour of poor producers. More than 3,000 products from coffees to flowers are Fairtrade certified.

During Fairtrade Fortnight there are events around the UK including a Fairtrade Mardi Gras in Wiltshire and a banana eating fest in the Bolton football stadium.

Check out www.fairtrade.org.uk click on 'Get involved' and then 'news and events' for information.

this month

By Laura Sevier



Exhibition

29 Jan - 28 Feb Plastic Bag Art

Artist Dodi Reifenberg creates portraits, two and three dimensional objects, 'land-works' and installations in public spaces using recycled plastic bags. See his work, including a newly-finished portrait of Barack Obama at this exhibition at Maddox Arts, 52 Brook's Mews, London W1. He's inviting people to bring their plastic bags to the show to build up a stock-pile for future works.

www.maddoxarts.com

1 Feb Seedy Sunday

Swapping seeds is all about taking control of seed sales and distribution from large corporations and increasing natural diversity. Seedy Sunday is the UK's biggest community seed swap and takes place every year in Hove Town Hall, Brighton and Hove. In return for a donation or in exchange for saved seeds, growers can choose seeds from dozens of traditional varieties of garden vegetables, to take home and grow. See www.seedysunday.org for details and for listings of other seed swap events in the UK.



PICK OF THE MONTH

BRITISH WOOL SCARVES

Classic, hard wearing and woolly, a scarf by Blacker Designs (AKA The Natural Fibre Company) will keep you warm until spring. Wool is sourced from Britain and the yarns are spun in a specialist wool mill in Cornwall and then woven by small scale weavers in Wales. Pure Shetland scarves are priced at £35 and Jacob/mohair yarn at £45. They also do a great range of throws – there are 9 different blends to choose from – and blankets.

➤ www.blackerdesigns.co.uk



Exhibition

Until 26 Apr

Wildlife Photographer of the Year

See the winning images from the 2008 competition at the Natural History Museum in London. The exhibition will tour round the UK in 2009. To find out where and when see www.nhm.ac.uk/wildphoto and click on 'tour.'



FOOD IN SEASON

Vegetables

- Beetroot
- Broccoli (purple sprouting)
- Brussels sprouts
- Cabbage
- Carrot
- Cauliflower
- Celeriac
- Chard
- Chicory and endive
- Garlic
- Jerusalem artichoke
- Kale
- Kohlrabi
- Leek
- Lettuce
- Onion
- Parsnip
- Potato
- Rhubarb (forced)
- Salsify
- Scorzonera
- Spinach
- Squash
- Swede
- Turnip



Salsify is also known as the oyster plant on account of its oyster taste when cooked

➤ How do I cook scorzonera?

This little known, carrot-shaped, black-skinned and white fleshed root vegetable is delicious and versatile. If you're lucky enough to get hold of some at a farmers' market cook it as you would any other root vegetable.

Two easy methods

Top, tail and peel then:

- Boil and mash it OR
- Sauté little chunks of it in oil or butter for 15-20 minutes.



Sensational snowdrops

It's snowdrop season. To find out the best place to see these much loved, hardy plants (the colder the weather, the longer the flowers last, with some flowering into March), see www.ngs.org.uk, www.rhs.org.uk and www.nationaltrust.org.uk

In Scotland, snowdrops even have their own festival. **The Annual Scottish Snowdrop Festival** runs from 1 February - 16 March and has walks and events held in more than 50 locations throughout Scotland from country estates to castles. One main venue is the Royal Botanic Gardens in Edinburgh where there will be a Snowdrop conference on 20 February. See <http://white.visitscotland.com>

this month

MAKE, DO, MAINTAIN...

HELP BIRDS NEST National Nestbox Week, organised by the British Trust for Ornithology, is from 14 - 21 February. UK birds need nest boxes for breeding because natural sites in trees and old buildings are being destroyed. Launched in 1997, the week has led to an estimated 5-6 million nest boxes across the UK. Find out how to make one or where to buy one from www.bto.org

MAKE A MORSBAG You've heard of guerilla gardening – now there's guerilla bagging, thanks to Morsbags, a non-profit organisation based in Richmond, London. The idea is to get together with people in your local community, drink wine and make reusable cloth bags (from old duvet covers, curtains from charity shops etc) and hand them out to the unsuspecting public for free outside supermarkets. More than 31,000 Morsbags have been made worldwide, potentially replacing 16 million plastic bags. See www.morsbags.com

GET ON (WITH) YOUR BIKE Lifecycle, a charity based in Bristol which aims to help people take up cycling is running one day training courses in bike maintenance (Bristol, 14 February) and half-term children's cycling courses (Bristol and Bath, 17 February). See www.lifecycle.org.uk



* OUT NOW: BOOKS AND FILMS

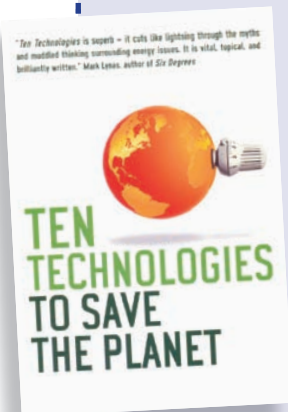
Ten Technologies To Save The Planet Chris Goodall (£9.99, Profile Books)

Chris Goodall, also author of *How to Live a Low Carbon Life*, is a man with a powerful

handle on the science of sustainability. Goodall uses figures and evidence with a fluid ease to lead a reader through complex technologies, exposing the arguments both for and against environmental technologies.

Although much of the book focuses on energy, Goodall

does look at less technological solutions to climate change, such as the production and burial of biochar (charcoal) to sequester CO₂. Thorough and readable, Goodall is nevertheless an incurable technotopian. Those expecting small-scale, bottom-up solutions need not apply.
Mark Anslow



The Carbon Fields Graham Harvey (£9.99, Grass Roots)

Graham Harvey has produced a paean to grass. And by God it's good.

The man is a rare thing in journalism: sporting an agricultural degree and many years of experience in the industry, he actually knows what he's talking about. His central point is that the rise and rise of nitrate fertilisers and chemical pesticides has led us to forget the value of mixed farming systems, especially those underpinned by grass or pasture. Explaining this allows him to paint a picture of all that is wrong with agribusiness, and sketch an outline of a brave new world.

That world, certainly for the UK at least, gives grass a central role – as key nutrient provider to grazing animals, as a carbon store, a flood-prevention device, a soil fertility builder and as a handbrake on an agricultural system set to push us further into the realms of climatic unknowns.

Mark Anslow



The A to Z of Global Warming by Simon J Rosser (£12.99, Schmall World Publishing)

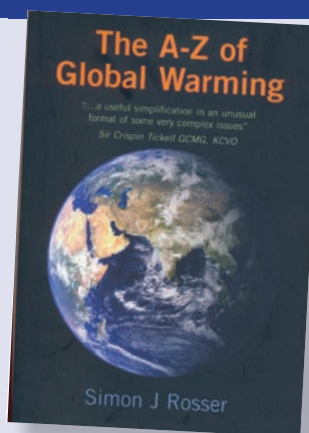
A is for Amazon, B is for Biofuels and C is for CO₂. This handy guide presents both the basics and the most up-to-date scientific knowledge in an unusual but surprisingly handy format. The key points at the end of each chapter are especially helpful.

Kissed by the Grape (DVD), a film by Fred van Dijk (£19.82)

Kissed by the Grape offers a commendably realistic view of contemporary organic/biodynamic wine growing. The hour-long documentary interviews three wine growers. Italy's Natalino Fasoli explains how his father became ill from using chemical pesticides. 'I saw no future for agriculture developed only with chemicals,' he says, adding that organic farming can be sustainable both environmentally and financially.

While horses plough his Chilean vineyards, Alvaro Espinoza explains why biodynamic growers promote self-sufficiency, home-made composts and lunar cycles. Spain's Miguel Torres says all winegrowers should fight climate change by recycling waste water from wineries and capturing greenhouses gases given off by fermenting wine. Torres adds that organic sprays are easily washed off by rainfall and tractor diesel is then wasted through respraying. Torres controversially suggests the answer is sap-penetrating sprays. These don't wash off but are banned under the organics category because they can leave residues. Organic wine's answer to Sideways this is not.

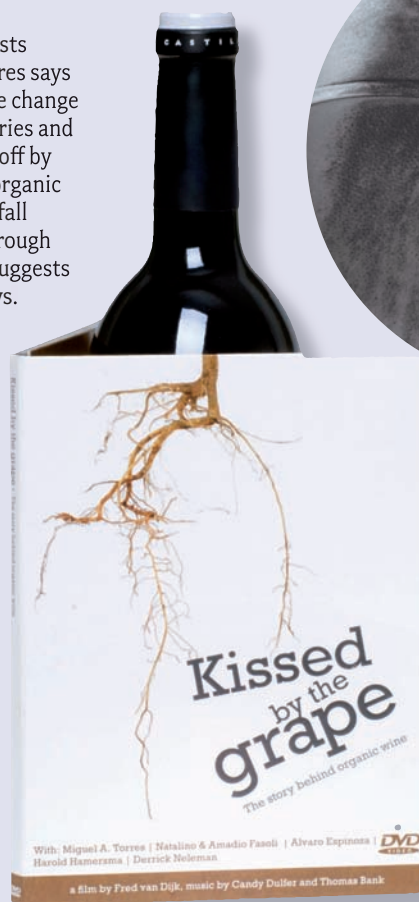
To order go to:
www.kissedbythegrape.com
Monty Waldin



Pants Exposed (Online film)

A short, campaigning film that puts the spotlight on knickers. The mission is to promote ethical fashion and challenge unfair trade. It's written and directed by Verity White and produced by Eco-boudoir in association with Pants to Poverty.

Watch it online at:
www.morethanprettyknickers.com



"This is excellent – wonderful recipes for DIY natural beauty and skincare without compromising on feeling 'pampered'. You CAN have your natural cake and eat it!"
 – Janey Lee Grace, author of *Imperfectly Natural Woman*



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Star Khechara

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– Janey Lee Grace, author of *Imperfectly Natural Woman*

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Skincare for health

For years, the *Ecologist* has exposed the chemical cosh that goes into many mainstream beauty brands. Thankfully, there are brands that have a strong commitment to using natural and organic ingredients. We sent a probing questionnaire to some of the most well-known manufacturers of natural beauty products to find out what goes into their range. Over the following pages we feature our top picks. By and large, these products are free from petrochemicals, parabens and synthetic ingredients. They are primarily plant-based and often organically certified. Of course, there is always room for improvement – especially as regards packaging and refillables. From handmade, to luxury to high street brands, this is your easy to use guide to natural beauty. **By Laura Sevier and Matilda Lee**



Handmade

Some of the best products available are made closest to home. Workshops in Wales, Cornwall, the Isle of Skye have mastered the art of the handmade

1 Spiezia Body Firming Oil 100ml, £25.50 **/****

● Made on an organic farm in Cornwall, Spiezia Organics Ltd was the first company in the UK to be certified 100% Organic by the Soil Association. The range of 23 products is made from high quality 'food grade' ingredients. www.spieziaorganics.co.uk

2 Essential Care Gentle Herb Shampoo 200ml, £9.50 */****

● 'All ingredients must have therapeutic value, as well as making the product a joy to use' is Essential Care's philosophy. Based in Suffolk, the enterprise is run by small family team. Its products are ideal for sensitive and eczema-prone skin. www.essential-care.co.uk

3 Earthbound Organics Jasmine & Honey Body Cream 120ml, £18.50 **/****

● People who have sensitive skins will find the Earthbound organic skin care products effective, gentle and soothing. They're handmade using herbs, local beeswax, floral waters and essential oils by founder Jo Ordonez in her

conservatory workshop in Wales. www.earthbound.co.uk

4 Trevarno Men's Rose & Jojoba Cleanser 100ml, £17.65 and Organic Calendular Soap 75g, £3.35 **/****

● Handmade using traditional production methods in the gardens of the historic Trevarno Estate in Cornwall, Trevarno makes wonderful natural and organic detergent-free soaps. Its creams and soothing ointments are good for winter or problem skin. www.trevarnoskincare.co.uk

5 Herbfarmacy Starweed Face Cream 50g, £12.50

● Most of the herbs used in this skincare range are grown on the Herbfarmacy farm in Herefordshire. Founder Dr Paul Richards, an experienced organic herb grower, has been making tinctures and plant oils for 25 years. www.herbfarmacy.co.uk

6 Hubble Bubble Organic Cypress & Palmarosa Bath Salts & Scrub and Juniper & Bergamot Perfume Stick, 200g £12.95 and 10ml, £5.50

● Launched with the help of the

Prince's Trust, Hubble Bubble lotions and potions are made from organic ingredients by Lake District aromatherapist and homeopath, Helen Bebbington. www.hubblebubbleorganics.co.uk

]] LIVE AND RAW...

Some brands are applying the principle of a raw food diet – that uncooked fruit, veg, nuts, seeds and grains provide the best nutrition – to skincare. Products are made through a special low temperature process using cold pressed butters and oils. The result? An 100% plant based, 'living' skincare product. See if you can feel the difference:

7 Raw Gaia For Her Daughters Living Moisturiser 60ml £12.50 **/****

● Raw Gaia is based in Brighton. www.rawgaia.com

8 Live Native Essential Woman Cream with Frangipani 30ml, £17.99, */**

● Live Native is made in the Isle of Skye. www.livenative.com

*Hair, **Men, ***Babies and children

Tried & tested

Remember when nobody had heard of 'organic' or 'natural' bodycare products? The brands below were the ones working studiously behind the scenes then and are largely responsible for helping make eco beauty the choice beauty option it is today



1 Lavera Aloe Vera Cleansing Milk for sensitive and delicate skin 75ml, £6.90 and Men's Face Wash, 75ml £6.45 *//****

● Lavera meaning 'truth' in latin is popular, affordable and widely available. The 21-year-old company based in Germany is still run by its founder Thomas Haase and has a range of 250 products.
www.lavera.co.uk

2 Weleda Calendula Baby Shampoo and Body Wash 200ml £5.95 *//****

● Extremely high quality ingredients go into making Weleda's impressive range of more than 100 bodycare products. Not satisfied with just being organic, more than half of Weleda's ingredients are grown biodynamically, many in its 15-acre Derbyshire gardens. Established in Britain in 1925, Weleda's products are excellent value-for-money.
www.welada.co.uk

3 Aubrey Organics Lumessence Rejuvenating Eye Crème 15ml, £19.99 and Rosa Mosqueta Shampoo 325ml, £8.99 *//****

● With nearly 250 hair, skin and bodycare products and longer than 40 years in business, US-based Aubrey Organics is one of the godfathers of the organic beauty industry. Founder Aubrey Hampton has an impressive list of 'firsts' which include using Rosa Mosqueta, blue chamomile and evening primrose in cosmetics.
www.aubreyorganicsuk.co.uk

4 Organic Pharmacy Rose Bath Oil 100ml, £39.95, *//****

● Founded by Margo & Franco Marrone in 2002, the Organic Pharmacy produce a range of very appealing own-brand products sold in their one-stop shop: a herbal and homeopathic dispensary, an urban day spa, a clinic.
www.theorganicpharmacy.com

5 Weleda Calendula and Chamomile Shampoo and Conditioner 250ml, £7.95 (see 2)

6 Dr Hauschka Cleansing Milk 145ml and Facial Toner 100ml both £20.55

● One of the most trusted and respected brands on the block, the Dr Hauschka range began life in the 1960s. Inspired by the work of Rudolf Steiner, many plants are grown in the manufacturer's biodynamic garden. The brand also supports fair trade projects, such as shea butter production in Burkina Faso.
www.drhauschka.com

7 Green People Children's Mandarin Toothpaste 50ml, £3.25 and Chamomile Baby Foaming Cleanser 100ml, £8.99 *//****

● With a really wide range of products from toothpaste and sunscreen, to shower gel this UK brand has an especially good selection for kids.
www.greenpeople.co.uk

8 Dr Bronner 18-in-1 Hemp Rose Pure Castile Soap 236 ml, £4.65

● You can wash your face, body and clothes in it, clean your teeth, kitchen surfaces or your pet with it... Dr Bronner's magic '18-in-1' pure castile soaps are made to be multifunctional. A 50-year-old American pioneering brand, they source olive oil from Palestinian fair trade producers. Available from good health food stores.

9 Neal's Yard Ready to Roll Remedies 9ml, £5 and Nourishing Lavender Shampoo 200ml, £10 *//****

● Founded in 1981 and boasting a huge range, Neal's Yard Remedies is a true pioneer. Many of the herbs are grown in Dorset near its eco factory and other herbs and essential oils are sourced from the UK. Some 163 of its products have organic certification. Full marks for a very transparent web site.
www.nealsyardremedies.com

* Hair, **Men, *** Babies and children



Luxury

Most conventional luxury bodycare brands still rely on the same old petrochemical-based ingredients. These brands really push the boundaries in their approach to greening the high-end market.

1 Louise Galvin Deep Conditioning Treatment 250ml, £9.95 */****

● Louise Galvin, daughter of revolutionary colourist, Daniel Galvin and creator of the Natural Locks line of shampoos and natural conditioners and masque for coloured hair, has 20 years experience in hair care. Her products use vegetable-derived moisturising and conditioning agents to nourish and shine. www.louisegalvin.com

2 Ila Spa Body Scrub for Energising and Detoxifying 250g, £49

● Ila Spa hand-blends its wonderfully fragrant oils, salts and scrubs in the Cotswolds. It takes its 100% natural claim seriously – essential oils are steam distilled, rather than using chemical distillation and preservation systems and are based on aniseed, cinnamon and balsam. www.ila-spa.com

3 Pai Chamomile and Rosehip Moisturiser for sensitive skin 30ml, £22

● Pai lists all ingredients in plain English on the pack (in addition to the obligatory Latin) so you know exactly what's in the bottle. Handmade in small batches in the UK, Pai's range of skincare (cleansers, moisturisers, lip balm and eye cream) is small but perfectly formed. www.paiskincare.com

4 Bamford Rosemary moisturising body cream 200 ml £36 and Eucalyptus Botanic Soap £10 ****

● Bamford make rich body creams simply scented with rosemary and camomile for the body, hands and feet, and nourishing body oils for skin, bath and massage. www.bamford.co.uk

5 Organic Apoteke Body Hydrate Oil 150 ml

● Organic Apoteke Founder Dr Nitasha Buldeo says this skin and bodycare range is inspired by her grandmother's 'dramatically effective' skin remedies which were based on 'an unusual fusion of Ayurvedic, traditional African and Native American wisdom' www.organicapoteke.com

6 Stella McCartney Gentle Cleansing Milk 200ml, £22

● CARE by Stella McCartney, the eco fashion designer, puts conventional luxury skincare to shame. Launched in 2007, after three years of development, CARE has done its homework – the products work in conjunction with one another. Expect results. www.stellamccartneycare.com

7 Dr Alkaitis Nourishing Treatment Oil 120ml, £60

● This cult US brand created by research scientist Dr Saulius Alkaitis produces a range of organic 'therapeutic skin food'. We recommend its nourishing

treatment oil for face, body and hair. www.alkaitis.co.uk

8 Nude Cleansing Facial Oil 200ml, £28

● Created by Bryan Meehan (who co-founded Fresh & Wild), the range specialises in skincare. Nude uses fairtrade shea butter, manketti, baobab oil and argan extract. The line aims for its packaging to be 100% PCR (post-consumer recycled) by 2010. www.nudeskincare.com

9 Jo Wood Usiku Eau de Toilette 50ml, £36

● Model Jo Wood began living an organic lifestyle in the early 1990s, a passion for which led her to create Jo Wood Organics, her own line of decadent bath and body care followed by an 'Everyday' body range and an eau de toilette range. Truly appealing, delicate and sophisticated scents, these are an *Ecologist* favourite. www.jowoodorganics.com

10 Saaf Skincare Ultimate Moisture Face Serum 30ml, £29.99

● Formed in Leeds in 2004 by Dr Mah Hussain-Gambles, Saaf Pure Skincare combines natural remedies with conventional pharmacology. Nine face and body products fuse Middle Eastern, Asian and western ingredients and are unique in being both certified Halal and organic. www.saafpureskincare.com

*Hair, **Men, ***Babies and children

The future of beauty lies in pure nature

Made from 100% food-based, certified organic ingredients, **Intelligent Nutrients** is one of the purest brands available. It's pioneered by US based Horst Rechelbacher, founder of Aveda. Here's what he has to say about being a ground-breaker:

'It's very important to me to break the rules of the cosmetic industry because they need to be broken. We believe that everything you put on your body should be pure, safe and nutritious.'

I am a worshipper of plant intelligence, especially of seed intelligence. The source of all life is the seed. All our hair, skin and bodycare products contain our super-antioxidant Intellimune Seed Oil Complex made from thousands of certified organic, cold pressed seeds.

I grow plant ingredients on my 600 acre organic farm in Wisconsin which is solar, wind and geothermal powered. The products are made in Italy by a big cosmetics manufacturer. They love this idea – they think it's the future. This is where the industry is going and where it needs to go. I am totally anti petrochemicals. I think it's the best thing that we'll run out – it's forcing us to look for non-toxic alternatives.'

www.intelligentnutrients.com

Available from Space NK stores



On the high street

1 Aveda Pure-Formance Exfoliating Shampoo for Men 200ml and Pure-formance Aroma Spray for Men £16.18 and £43

● Aveda's work with small and emerging farmers in indigenous communities – such as Brazil, Peru, Nepal, Australia and South Africa – is unparalleled. Empowering the growers that make the ingredients, helping protect endangered environments and peoples, is equalled by its ongoing efforts to improve its products – getting rid of many of the synthetic ingredients that were once there.
www.aveda.co.uk

2 Tesco bnatural Organic Soothing Night Cream 50ml, £3.97 and Energising Facial Scrub 75ml, £3.79*

● Organic products with mass market appeal and all for under a fiver, Tesco's bnatural range

comprises eight face care products that have been formulated with 95% or higher certified organic ingredients.
www.bnaturalorganic.co.uk

3 Boots Botanics Cleansing Body Wash 250ml, £4.99 **/**/****

● Botanics Organics is a purer offshoot of the Boots Botanics range. Each product clearly states what percentage of the range is organic. Product containers are made from recycled materials where possible. Available at Boots stores

4 Duchy Rose & Mandarin Shampoo and Conditioner £4.95 each

● Duchy Originals, established by HRH The Prince of Wales in 1990, has a bath and body range of three Rose & Mandarin; Bergamot & Lime and Lavender. Profits go to the Prince's Charities Foundation protecting the

countryside and wildlife.
www.duchyoriginals.com

5 Patently Obvious Mint & Lime Handwash 300ml, £3.49

● Patently Obvious is primarily made from a blend of natural and naturally derived ingredients. It does contain some synthetics but its makers are working on how they can remove these too. Available at Sainsbury's, Boots and www.KMIshop.com

6 Jigsaw, Body Scrub 150ml, £22.50

● Fashion label Jigsaw's new bath and beauty range of 10 products 'Jigsaw Organics' is its first foray into the beauty arena. Launched in 2008, 70% of the ingredients are Soil Association certified organic. The founder of Jigsaw, John Robinson, is an organic farmer who strongly believes in the benefits of organic

living and worked closely on the development of the range. Available in Jigsaw stores

7 Bulldog Moisturiser 100ml, £5.99

● It just didn't seem right that men were being ignored, so Rhodri Ferrier and Simon Duffy felt as they came up with Bulldog, a bath and body range designed specifically for men with as few synthetic ingredients as possible.
www.meetthebulldog.com

8 Waitrose Organic Soothing Hand Cream 150ml, £3.99

● The first supermarket to offer a full organic beauty range certified by the Soil Association, Waitrose Organic Body and Bath range comes at affordable prices.
www.ocado.com

* Hair, **Men, *** Babies and children

Cosmetics...

1 Aveda Inner light Liquid Foundation 30ml, £20.50; Triple Accent Petal Essence 8.5g £16.64 and Moss Eye Definer 1.14g, £12.00

● One of the widest range of plant-based makeup products on the market, Aveda is a pioneer in formulating products with plant and mineral pigments instead of synthetic dyes. Progressive packaging includes customisable and refillable compacts and lip colour cases. www.aveda.co.uk

2 Elysambre Liquid Eyeliner 4ml, £15.90 and Fluid Foundation 30ml, £17.95

● As well as ticking our 'free from' boxes this French label impressed us with its packaging – a refillable system using copper cases. Refills are made from recycled paper. www.naturisimo.com

3 Dr Hauschka Translucent Makeup 30ml, £17.62, Kajal Eyeliner Duo 1.98g, £13.70 and Volume Mascara 6ml, £15.66

● A firm favourite at the *Ecologist*, you can't go wrong with Dr Hauschka. For longer than 40 years the brand has led the way in holistic skin care. Their makeup range is extensive, effective and trustworthy. www.drhauschka.com

4 Lavera Eyeshadow Duo No.4 3.6g, £11.20, Lipgloss No.6 6.5ml, £7.79, No.2 Eyeliner 1.15g, £6.12

● An affordable, wide range of makeup from one of our top 'tried and tested' brands. Lavera only uses natural and organic ingredients all of which are clearly listed on its packaging and website. www.lavera.co.uk

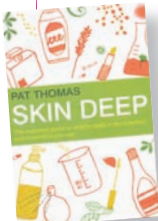
5 Jane Iredale Amazing Base Loose Mineral Powder 10.5g, £26.95 and Pure pressed Base Mineral Powder 9.9g, £27.69

● A complete line of makeup based on minerals and botanical extracts, Jane Iredale created her US-based range in 1994. Natural preservatives include vanilla extract, Vitamin C and sweet almond oil. www.janeiredale.com

» CONFUSED BY A LABEL? SUSPICIOUS OF AN INGREDIENT?

To look up ingredients online go to the US Environmental Working Group's Cosmetic Safety Database www.cosmeticsdatabase.com.

Pat Thomas' book *Skin Deep* (Rodale, £7.99) contains a handy 'Chemicals A-Z' index. If you, or anyone you know, needs any convincing as to why natural products are best, buy this book.



6 Organic Glam Pink Blusher 3g, £24.42 and Nude Lipstick 3g, £16.59

● A sophisticated collection of glossy lipsticks, highlighters, foundations and eye shadows, Organic Glam launched in 2007 as the Organic Pharmacy's own organic extract and mineral makeup range. www.theorganicpharmacy.com

7 Suki Skincare Pure Cream Stain for Lip and Cheek 15ml, £32.00 and Triple Cream Eye Definer 15ml, £34.00

● US-based Suki Kramer created SukiColor a five-product makeup range that produces a sophisticated yet natural look. Mascara, tinted moisturiser, eye definer, liquid concealer and the multitasking pure cream stain are pure and luxurious. www.sukipureskincare.co.uk

8 Lily Lolo Stardust Powder, 8g mineral in 40ml sifter jar, £12.00 and Pure Sparkle Eye Colour 3g mineral powder in 10ml sifter jar, £5.00

● Created by Vikki Khan in 2005, UK-based Lily Lolo is a mineral-based makeup range which includes 21 shades of foundation, four finishing powders, five concealers and bronzers, blushers and eyeshadows. www.lilylolo.co.uk



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Dr Jane Goodall

Conservationist

You've spent nearly 50 years studying chimpanzees and your research into their behaviour transformed scientific perceptions of the relationship between humans and animals. How similar are chimpanzees to us?

The difference in our human DNA and theirs is less than two per cent. They show emotions that are similar or identical to those that we call happiness, sadness, fear, despair and so on. Strong, affectionate and supportive bonds that develop among family members can last a lifetime of 60 years or more. They kiss, embrace, hold hands, pat one another on the back, swagger and shake their fists.

What are the main differences?

We have developed a language that enables us to make plans and discuss ideas. There has been explosive development of the human intellect. Yet we are destroying the only planet we have. It seems that, somewhere along the way, we have lost wisdom.

What or who makes you most happy?

I am most happy sitting on my favourite peak above Gombe National Park in Tanzania where I first began researching chimpanzees. Unfortunately, I only have that opportunity a couple of times a year. I very much enjoy walking my dogs along the beach on the rare occasions that I find myself at home in England. I treasure any time I have with my

son, grandchildren and extended family. Working with young people also brings me incredible joy. I have hope in the tremendous energy, enthusiasm and commitment of youth from around the world. With Roots & Shoots, the environmental and humanitarian youth program I started in 1991, we have already inspired almost 100,000 young people in nearly 100 countries to effect positive change in their communities (see www.rootsandshoots.org).

Can you describe a typical day?

In 1986, my life changed when I attended a conference in Chicago that brought together the community of field researchers that were studying chimpanzees. One session was devoted to the importance of conservation. Another session discussed the often cruel

How to support Jane's work

The Jane Goodall Institute, which aims to protect chimpanzees and their habitats, has 23 offices around the world. It also runs community-centered conservation and development programs in Africa and Roots & Shoots. www.janegoodall.org

Jane is global ambassador for Gant clothing and has worked with them to produce an organic cotton 'Bag of Hope' (£8). Each purchase supports the Jane Goodall Institute. www.gant.com

treatment of chimpanzees used in entertainment and medical research laboratories. I arrived at the conference as a scientist. I left as an activist. I had a new mission, which has led to my spending approximately 300 days a year on the road advocating the way to a healthier future for the earth. I talk about the social and environmental problems that face our planet including its great ape populations.

So for the past 22 years or so, my typical day involves waiting in airport lines, checking into hotels and meeting amazing people at lecture halls around the world. While it's quite exhausting, it has to be done.

What are the biggest threats facing chimpanzees?

Loss of habitat and the commercial bushmeat trade. Around the turn of the last century, there were an estimated one to two million chimpanzees living in the African forests. Today, there are fewer than 300,000 in the wild. I am always amazed at how many people are still unaware of the extent to which great apes – gorillas, chimpanzees, bonobos and orangutans – are endangered.

How do you define success in life?

Finding a passion and pursuing it. In my day, women were thought unfit to travel alone or work alone, especially in a place as wild and presumably dangerous as Africa. As a woman, entering the male-dominated field of primatology was also considered a bold move. Many people thought I could not do it, but I did. This is why I encourage young people, particularly young girls interested in science, to pursue their dreams – and never give up.

What's your greatest achievement?


Perhaps one of the greatest honours I have ever received was being named a United Nations Messenger of Peace in 2002 by then UN Secretary-General Kofi Annan. I was reappointed by Secretary-General Ban Ki-Moon last year. I carry the message that to achieve global peace, we must not only stop fighting each other but also stop destroying the natural world.

Are you optimistic about the future?

We have to be optimistic if we want a better place for future generations. Using the right amounts of head and heart, I have absolute faith that working together we can save threatened species, the planet and ultimately, ourselves.

Do you sometimes feel discouraged?

When I feel discouraged I do what my mother always used to do when we were children – she would say: go and read a book. That is a great thing to do.



John Cossham won Oxfam's search for the lowest carbon-using charity supporter. Here he talks about living the low life

How to...

reduce your carbon footprint

Despite being a committed green for almost two decades, **John Cossham** was surprised to find he had one of the lowest carbon footprints in the country

You sometimes see lists of five things you can do to save the planet: change your light bulbs, turn your thermostat down by a degree. No one is going to save the planet by doing that. I believe being green is not about saving the planet; it is about behaving responsibly, it is about enjoying living a 21st century life and preparing yourself for peak oil.

I've been trying to make green choices for 18 years. Recently, through my local Carbon Rationing Action Group, I entered an Oxfam competition to find the supporter of the charity with the smallest carbon footprint. The Government's carbon calculator Act On CO₂ estimated I had a carbon footprint of 0.45

tonnes a year out of the portion of emissions that is easily measurable – the lowest of all who entered the competition.

There is no secret to reducing your carbon footprint; people just need to look at the energy they use within their home, their diet, the transport they use and what they do in their community.

One reason my carbon footprint is so low is that we don't use central heating. We have radiators in our house but we have not used them for four or five years. Instead, we have two smoke-free wood-burning stoves, which are both highly efficient. The stoves heat our rooms as well as boiling water in our kettle. They heat our washing-up water, bath water and we cook on them as well. We do have a gas

supply to the house and we use the gas rings and the oven. I would love to have a wood-fired oven, but you have to be realistic. Being green is about doing whatever you can; it's not about wearing hair shirts or spending vast amounts of money. You might invest some money, as we did with our stoves, but you save in the long run.

We also have lots of low-energy appliances, although we don't use many. I don't have a mobile phone and we don't use a lot of gadgets. We do have two televisions but they always get switched off at the wall. We have low-energy light bulbs and we have an A-rated fridge and freezer. These are very easy ways to cut your bill, and your carbon footprint.

In my view, being vegetarian or vegan is

Carbon calculations

- John's carbon footprint (per year):
0.45 tonnes
 - UK average per person*:
4.35 tonnes
 - John's family of four:
1.6 tonnes
 - Average UK family*:
9.96 tonnes
 - John's utility bills last year:
Gas: £60
Electricity: £227
- Try the Government's carbon calculator at <http://actonco2.direct.gov.uk>

*Source: <http://actonco2.direct.gov.uk>

actually one of the best things you can do to lower your CO₂ emissions. If you have a diet that is heavy on milk, cheese and meat, then you have a much higher "hidden" carbon footprint – the emissions that are a by-product of the production of those foods. Most people in the UK eat meat every day; only a very small minority is truly vegetarian. I have been vegetarian for 23 years and well over 99.99 per cent of the time I do not eat any animal products.

Being ill has a high carbon footprint; hospitals use up a vast amount of resources. If we had a healthier community we would be using up a small percentage less carbon, especially if that came through people walking and cycling to work instead of driving. Even so, I can't abide the idea of driving to a gym and sitting on a static bicycle, watching TV, peddling away; I do not understand it. The only static bicycles I have used are when I have been generating power for a sound system at a green festival.

Treading softly

Being green is not about sacrifices; it is about having a better quality of life. I don't feel as if I'm missing anything; I am not taken in by the advertising. I do not want to have a better car than my neighbour, although I am really proud of my bicycle. I had one specially built because the bikes I had could not stand up to the hammering I was giving them, riding every day and carting around compost and logs. The one I have now should last for 20 years. I am a children's entertainer and always travel to work on my bicycle. I love cycling. It is a great way to get around and with the congestion in a city like York you move faster than the traffic.

Having said that, I actually enjoyed driving. When I got my licence, I realised I must never have a car or I would be one of those irritating people who claims to be green but drives. In my mind, if you drive around everywhere, you are not green. Being green involves choosing to go by bus and public transport, cycling, walking and travelling less. If that means I cannot do something, I won't do it.

I also don't fly and I believe people shouldn't. I understand the attractions of travelling and I get a real buzz from watching travel programmes on television. But there are still many wonderful places to visit locally; there is so much to see in Britain. We took a local holiday this year to Whitby and we had a family holiday for under £1,000. When people go abroad and fly, the costs are a lot higher.

My two sons, aged nine and 11, have been brought up as greens and they know no different. They know their friends may have more gadgets than they do, and go on foreign holidays, but they are not too bothered.

The Government's carbon calculator only takes into account home energy use and travel. It would be interesting to calculate the other portion based on my diet and my lifestyle. However, I would want to take into account the amount of wood I take out of skips for my stove – material that otherwise would be driven to landfill sites.

Ultimately, I feel that I am quite grounded and realistic; I do not expect people to give up things immediately. People should do it gradually and, most importantly, keep doing it. I could still do more things that would make me greener, but I know that I am doing more or less the right thing and I am really enjoying it.

As told to Sam Southgate



John, who lives in York, doesn't drive. He uses a specially-built bike every day, often hauling around wood and compost

PHOTOGRAPHY: MIKE TIPPING

MORAL FIBRES

WHAT'S THE MOST SUSTAINABLE FABRIC?

Unravelling a garment's green credentials isn't easy, says **Matilda Lee**. Instead of fretting about what not to wear there's a few simple things we can do (that could save money too)

It may be an endless source of fashion faux pas jokes, but polyester, in its heyday in the post Second World War period, was considered a miracle fabric, famed for its affordability and easy care properties – relatively painless to wash, dry and iron. Many a modern woman did it 'liberate' from the drudgery of clothes maintenance. Cotton, cultivated since 3000BC, on the other hand, is unmatched by any synthetic in terms of softness, comfort and durability. Its two most famous offspring – t-shirts and jeans – are bought in the hundreds of millions globally.

Polyester and cotton are the two dominant fabrics in one of the world's most polluting industries, textiles. But the lifecycle analyses – covering the production, processing, use, and disposal of a fabric – have so far failed to determine their overall footprint. This is because, as garments go, a lot depends on how it is made and who buys it.

Polyester is man-made by melting and combining two types of oil-derived plastic

pellet to create the polymer polyethylene terephthalate. Polyester production can result in air and water emissions of dangerous substances including heavy metals, and the greenhouse gas nitrous oxide (aka laughing gas). Most polyester is manufactured using antimony as a catalyst, which is a carcinogen and toxic to the heart, lungs, liver and skin.

Cotton is a natural fibre, but one that is grown with a mind-boggling array of toxic chemicals. Endosulfan, a widely-used insecticide has been linked to several thousand deaths of cotton farmers and their families. A single drop of aldicarb, a pesticide used on cotton in 26 countries, absorbed on the skin can kill an adult. Less than a third of the world's cotton is rain fed and as it is very thirsty, leeching away a vital resource in many drought-prone areas where it is grown.

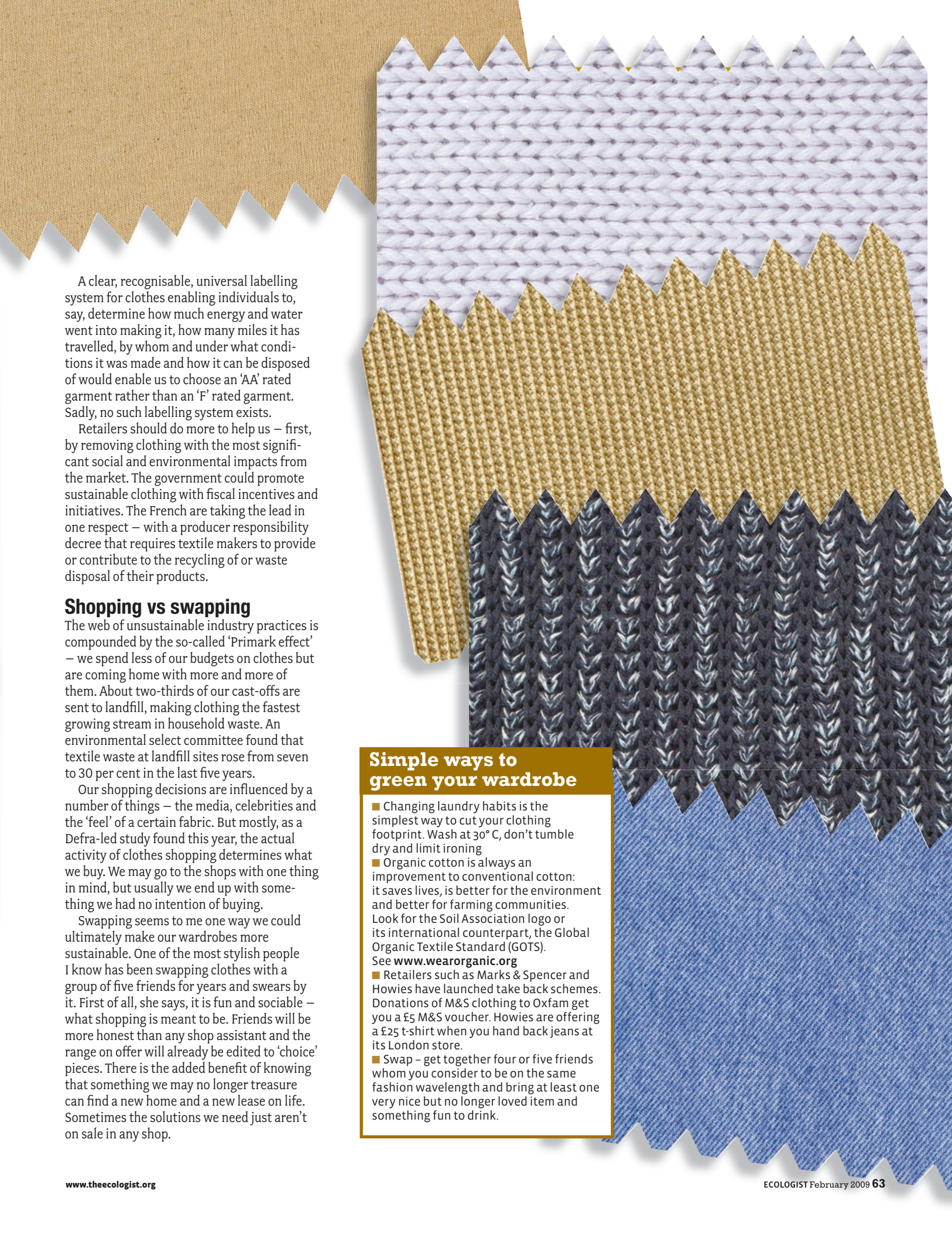
When it comes to the various steps between turning a raw fabric into a finished product, overall environmental impact may vary wildly. In the dyeing process alone, water use can range from a best-case scenario of 80

litres per kilo of fabric, to an unscrupulous 800 litres. The same is true for the overall energy and waste a fabric uses and produces.

Another missing link in determining a sustainable fabric is what happens to a garment once it leaves the shop. A study by Cambridge University found that the 'global climate change impact' of a cotton t-shirt can be cut by 50 per cent simply by altering washing, drying and ironing (see box).

More vexing is the fact that choosing between cotton and polyester is often not an option. Rarely do you come across something that is made 100 per cent of any one fabric. Most clothes are blends of two or more fabrics. Even a '100 per cent' fabric can include as much as five per cent of other fabrics.

Mixing fabrics may lend a cotton garment easy care properties and softness to a synthetic one, but it has proven a nightmare for clothing afterlife. Reprocessing a mixed fabric garment destroys the quality of the fabric, so most are downcycled to cleaning rags or insulation.



A clear, recognisable, universal labelling system for clothes enabling individuals to, say, determine how much energy and water went into making it, how many miles it has travelled, by whom and under what conditions it was made and how it can be disposed of would enable us to choose an 'AA' rated garment rather than an 'F' rated garment. Sadly, no such labelling system exists.

Retailers should do more to help us – first, by removing clothing with the most significant social and environmental impacts from the market. The government could promote sustainable clothing with fiscal incentives and initiatives. The French are taking the lead in one respect – with a producer responsibility decree that requires textile makers to provide or contribute to the recycling of or waste disposal of their products.

Shopping vs swapping

The web of unsustainable industry practices is compounded by the so-called 'Primark effect' – we spend less of our budgets on clothes but are coming home with more and more of them. About two-thirds of our cast-offs are sent to landfill, making clothing the fastest growing stream in household waste. An environmental select committee found that textile waste at landfill sites rose from seven to 30 per cent in the last five years.

Our shopping decisions are influenced by a number of things – the media, celebrities and the 'feel' of a certain fabric. But mostly, as a Defra-led study found this year, the actual activity of clothes shopping determines what we buy. We may go to the shops with one thing in mind, but usually we end up with something we had no intention of buying.

Swapping seems to me one way we could ultimately make our wardrobes more sustainable. One of the most stylish people I know has been swapping clothes with a group of five friends for years and swears by it. First of all, she says, it is fun and sociable – what shopping is meant to be. Friends will be more honest than any shop assistant and the range on offer will already be edited to 'choice' pieces. There is the added benefit of knowing that something we may no longer treasure can find a new home and a new lease on life. Sometimes the solutions we need just aren't on sale in any shop.

Simple ways to green your wardrobe

- Changing laundry habits is the simplest way to cut your clothing footprint. Wash at 30° C, don't tumble dry and limit ironing
- Organic cotton is always an improvement to conventional cotton: it saves lives, is better for the environment and better for farming communities. Look for the Soil Association logo or its international counterpart, the Global Organic Textile Standard (GOTS). See www.wearorganic.org
- Retailers such as Marks & Spencer and Howies have launched take back schemes. Donations of M&S clothing to Oxfam get you a £5 M&S voucher. Howies are offering a £25 t-shirt when you hand back jeans at its London store.
- Swap – get together four or five friends whom you consider to be on the same fashion wavelength and bring at least one very nice but no longer loved item and something fun to drink.



Love doesn't have to be a dirty business – unless, of course... This Valentine's Day **Pat Thomas** makes a heartfelt plea for a little non-toxic lovin'

Tainted Love

associated with cancer risk such as butylated hydroxytoluene (BHT), nylon 6, ferric red (iron) oxide, polyethylene and titanium dioxide. In 2005, a paper presented at the annual meeting of the American College of Rheumatology in San Diego, California showed that women who reported that they used lipstick three days a week had a 40 per cent increased risk of developing lupus and the risk increased with years of lipstick use.

In 2007, tests on red lipsticks made in the US, for the Campaign for Safe Cosmetics, found that 20 out of 33 brand-name lipsticks tested contained detectable levels of lead, with levels ranging from 0.03 to 0.65 parts per million (ppm). None of these listed lead as an ingredient. To put this into perspective, the 'safe' level of lead in candy is 0.1 ppm.

Lead can harm almost any system in the body but is particularly toxic to the nervous system and while you can be exposed to lead from other sources, for instance air pollution, why would you voluntarily put it on your lips?

Chemical fallout

Then there is the perfume, sold as a luxury item that enhances our wellbeing and sexuality, but at heart composed of neurotoxic solvents (not dissimilar from those favoured by glue sniffers the world over) and volatile chemicals usually more at home in garages and factories. A typical bottle of perfume

Candles, cards, chocolates... condoms. You may well be one of those love scrooges who refuses to give in to a bit of romantic indulgence. But if you are among those for whom any excuse for a bit of lovin' is a good enough excuse, it can't have escaped your notice that the festival of St Valentine is, shall we say, a bit product-oriented these days. Really, the amount of tat we are encouraged to buy and wear in order to be considered lovable has got completely out of hand.

Approximately one billion Valentine's cards are sent each year worldwide, making the day the second largest card-sending holiday of the year behind Christmas. Women purchase approximately 85 per cent of all these. Just for the moment, let's ignore the trees that have been cut down to facilitate such exchanges and assume that you will either recycle them in your green bin or, better yet, keep them and recycle them into much more interesting home-made cards for next year.

Instead, consider all the other commercial accompaniments to this once-a-year love fest and the way they could be adding to your body's total toxic load.

For instance, there may be something iconically feminine and alluring about red lipstick. But before you pucker up, consider this: what goes on your mouth can also go in your mouth. Most lipsticks are composed of synthetic oils and petroleum-derived waxes. When a woman wears lipstick, she may swallow some of it, but it can also be absorbed through the lining of the mouth and it is estimated that a woman may ingest more than four pounds of lipstick in her lifetime. Kiss her and you'll be getting some of that too.

In 2004, the Environmental Working Group survey *Skin Deep* examined 711 lipstick products and found that 28 per cent contained ingredients



BEHIND THE LABEL

contains benzene derivatives, aldehydes and many other known toxins capable of causing cancer, birth defects, central nervous system disorders, allergic and asthmatic reactions. These can get into the body by being inhaled and being absorbed through the skin. When fragrance chemicals penetrate the skin, they can cause discoloration of internal organs. They can also be toxic to the liver and kidneys. Still others accumulate in fatty tissue and leech slowly back into the system or are passed on to our children through breast milk.

This applies equally to men's fragrances as to women's, so it's perhaps wise to ditch the Lynx in favour of something a bit safer and less overpowering, boys.

If you are lighting candles to set the mood, be aware that research by the US Environmental Protection Agency and the American Lung Association has found that burning candles emit a frightening range of volatile organic compounds. These include known carcinogens such as acetaldehyde, formaldehyde, acrolein, acetone, benzene, 2-butanone, carbon disulfide, carbon tetrachloride, creosol, chlorobenzene carbon monoxide, cyclopentene, ethylbenzene, phenols, styrene tetrachloroethene, toluene, trichloroethene and

xylylene amongst other toxins.

As a candle burns, it releases largely invisible but dirty soot containing sub-micron size particles light enough to remain suspended in the air for a considerable time, and small enough to be easily absorbed into the body once inhaled. Scented candles, so popular for the romantic ambience they lend to a room, are more likely to give off more of this soot than unscented candles. Microscopic soot particles are associated with higher rates of respiratory problems and can generate free radicals – 'sniper' molecules that can damage cells.

Instead of buying candles made from petroleum-based waxes, look for those made from cleaner burning and naturally scented beeswax and bayberry. Soya wax also burns cleanly but unless the label guarantees that the wax has not come from GM soya, it may be ethically better to avoid such candles.

Got protection?

Then there's the nitty gritty stuff. Condoms may not have much of an environmental footprint but it's worth considering

where they come from and where they go when you are done with them. Condoms are made either from polyurethane or latex. Polyurethane is a non-biodegradable plastic and probably best avoided.

Latex condoms are a slightly better option but even these are coated with lubricants and made with stabilisers, preservatives and hardening agents that make them slower to degrade than unadulterated latex.

Avoid those with spermicides. Condoms are so reliable you don't need to use them with spermicide – usually nonoxynol-9, or N9 – and the added chemical doesn't give any extra protection against STDs. In some cases, it may actually increase an individual's risk because the spermicide can irritate the vaginal and rectal lining making it more vulnerable to infection.

Whatever they are made of, don't flush condoms down the loo – it is a ridiculous waste of water and they can

clog up the sewer system (or end up floating around in the ocean with all our other plastic junk). Wrapped in a tissue in the bin is best.

There may be something sensual about slathering on a bit of personal lubricant but because of the way in which they are used – in intimate places and in the heat of the moment – most of them contain a number of preservatives such as sodium hydroxide (also known as lye or caustic soda) that can be irritating to the mucous membranes. Some, like parabens, are not only irritating, they are oestrogen mimics.

Most of the data on skin absorption of these chemicals is based on skin outside the body or on oral ingestion. But absorption via the mucous membranes in the rectum and vagina is, generally speaking, many times greater than through the skin.

Many studies have found that personal lubricants have a deleterious effect on sperm motility and the ability of sperm to penetrate cervical mucus, even in the low concentrations of less than 10 per cent found in these products. So when safer alternatives are available why not opt for them?

The bottom line is that love, like everything else, is better kept simple. For the romantically – or environmentally – challenged that means, in person is better than email, handwritten notes are better than greetings cards, home-made is better than store bought, natural is better than synthetic, naked is better than overdressed and organic beats toxic every time.

Sexual healing...

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- Lavera www.lavera.co.uk
- Lily Lolo www.lilylolo.co.uk
- Purity Cosmetics www.puritycosmetics.co.uk

Perfumes made from natural oils:

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- AromaSciences www.aromasciences.com
- Nature's Gift www.naturesgift.com
- Intelligent Nutrients www.intelligentnutrients.com

Natural beeswax candles

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- Fantasy Candles <http://shop.beeswax-candles.co.uk>
- Green Gift and Hamper Company <http://greengifthamper.com>
- Lattice Lights www.latticeclights.net

Organic chocolate

- Green & Black's www.greenandblacks.com
- Dagoba www.dagobachocolate.com
- Booja-Booja www.boojabooja.com
- Montezuma's www.montezumas.co.uk

Fairtrade condoms

- French Letter www.french-letter.co.uk

Personal lubricants

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READER OFFER

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See the rest of the range at:
www.aubreyorganicsuk.co.uk

About Aubrey Organics
Aubrey Hampton founded the US based skincare and cosmetics company Aubrey Organics in 1967 with the desire to create a product line that was 100% natural. Taking the parabens and preservatives out of cosmetics, he pioneered the use of natural alternatives such as grapefruit seed extract. All ingredients are natural and, where possible, organic, and sourced at a fair price.



HOW TO ORDER: Visit the UK’s only dedicated Aubrey Organics online shop at www.aubreyorganicsuk.co.uk Click on ‘skincare’ then ‘dry skin’

The offer is ongoing and has no end date.

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READER OFFER

Weleda

Win a free Rosemary & Ginger Shampoo and Conditioner gift set worth £15.90

Weleda has offered *Ecologist* readers the chance to win a free Rosemary & Ginger Shampoo and Conditioner haircare set. There are 100 up for grabs.

Why Weleda?

Weleda is one of the *Ecologist's* favourite natural beauty brands (see page 54). Not satisfied with

just being organic, more than half of Weleda's ingredients are grown biodynamically, many in its 15-acre Derbyshire gardens. Established in Britain in 1925, Weleda's products are excellent value-for-money.

The new Rosemary & Ginger haircare range is free from lauryl / laureth sulphates (and without SLS/SLES)

and artificial additives or synthetic preservatives (such as parabens). All ingredients are GMO free. The Rosemary & Ginger Shampoo is formulated for normal to dry hair, and contains extracts of organic rosemary and ginger, which are renowned for their stimulating and invigorating properties.

Weleda's plant-based cleansing agents are made with biodegradable coconut and sugar beet. These plant detergents are endorsed by the certification scheme Ecocert, and produce a very soft lather to cleanse your hair gently but effectively without stripping the natural oils or irritating the scalp or eyes.

The Rosemary & Ginger Conditioner is made with 100% organic plant extracts to replenish and nourish the scalp and hair after washing to leave it tangle-free and manageable.

www.weleda.co.uk

HOW TO ORDER: Ring Weleda's special offer telephone line (Tel: 0115 944 8690) ON OR AFTER JANUARY 23 and leave your name, address and an email address or contact phone number.

Offer ends: 28/02/09



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www.oceansofgoodness.com



HOW TO ORDER: Send your name, address, telephone and email address by phone: 01293-520460; email: seaweed@oceansofgoodness.com; or post: Oceans of Goodness, 4 Springfield Road, Southgate, Crawley RH11 8AD

Offer ends: 31/03/09 (or until stocks last)

Holidays

There are plenty of ways to take a planet-friendly break and be an ethical traveller, from staying in a yurt in Devon to ecotourism holidays that benefit local communities and the environment. See below to find out about places in the UK and abroad where you can holiday with a clear conscience



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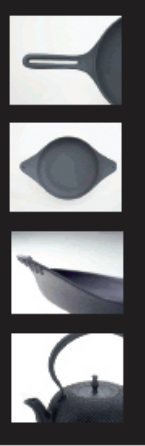
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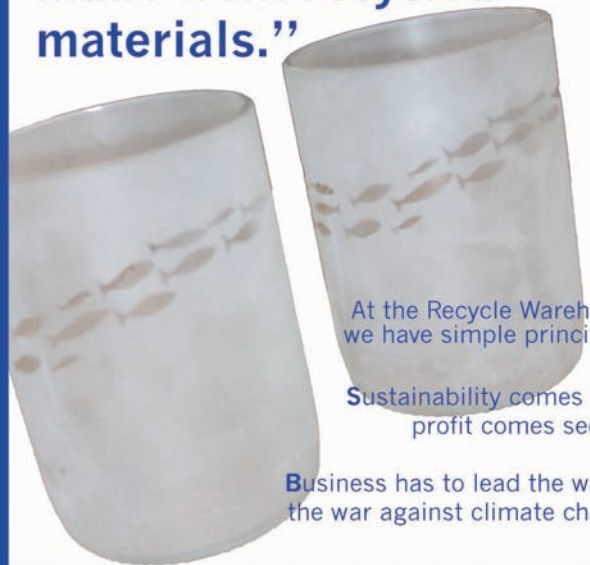
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[†]Source: Source: Uswitch comparison site. The annual bill shown is based on 4MW of consumption per annum for a typical household on a single rate meter. The figures shown are the average cost across all regions in the UK as prices do vary from region to region. Please contact Ecotricity for more information and an up to date quote on 08000 302 302. Both tariffs are 100% green energy sourced and are backed by Renewable Energy Guarantees of Origin which means that for every unit of electricity you use, a unit of renewable electricity has been fed into the electricity network. ^{††}Source: whichgreen.com. £462 is the average annual investment per customer over the last 4 years.

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Food from the margins

Please allow us to respond to Lindsey Hedges, who accuses The Vegan Society of effectively running an anti-farming campaign (*Letters*, Dec/Jan 2009).

The Vegan Society is actively working to support farmers, to encourage the development of sustainable agriculture in the UK. For example, I regularly contribute to Defra workshops, consultations and other discussions.

Proven stock-free farming techniques make the most efficient use of our precious land and water resources. Iain Tolhurst, who farms Tolhurst Organic Produce in the Thames Valley, demonstrates these straightforward, profitable and sustainable methods. Lindsey Hedges is welcome to contact us for more information.

Much land which is 'marginal' for current arable farming strategies can be productively used for sustainable tree-based growing. Upland areas can be re-forested and managed to produce food, fibre, timber and biomass.

Nigel Winter
CEO, The Vegan Society

Note from the Editor: See this month's cover story for a more detailed discussion of the use of so-called 'marginal' land.

A plea for bees

There's a well-known myth in India about bodies in the river. Villagers notice a body floating by and they take it out of the river and bury it. Then more bodies float by, and the villagers take them out and bury them.

Soon, so many bodies are floating downriver that the village can't keep up. They run to the village elder to ask him how to fish all the bodies out.

The elder tells them to stop fishing out bodies and instead tells them to walk upstream to find out why bodies are falling in the river in the first place. He tells them that unless they stop it, they won't solve the problem.

They do so, find out why people are dying and ending up in the river, and stop the whole mess.

Here is my question: why is it, when making statements to the Press, the British Beekeepers Association (BBKA) seems very reluctant to even mention pesticides as a possible cause of problems to bees, despite massive European evidence to the contrary?

LETTER OF THE MONTH

Affordable economics

I am disappointed by the 'either/or' argument put forward by Richard Heinberg in his recent comment (*Green > greenbacks*, November 2008).

In this piece, he judges the relative importance of dealing with the financial 'credit crunch' or with environmental threats, apparently unaware of the interdependence of these issues; the environmental

problems as well as the 'credit crunch' are a direct result of the debt-based money system!

Reformers have been pointing this out for much longer than I've lived, but now the debts generated by the very nature of the system (as well as the obscenely huge fortunes) have grown inexorably.

In my review of his 2003 book, *The Party's Over*, I wrote: 'His message reinforces for me the vital importance of

three basic reforms: to move from the debt-money system toward one in which money is spent into circulation and adjusted in volume to meet society's needs, to eliminate the mountains of debt which drive the "growth imperative" and are the basis of the growing inequality of income, as well as distorting the balance of the economy; move to LVT [land value transfer] and resource and pollution taxes and away

from taxes on effort; and introduction of Basic/Citizens' Incomes, to distribute the "wages of the machine", or "common cultural inheritance".

These reforms would make possible – i.e. affordable – all the other changes needed to move to a carbon-neutral, ecologically balanced way of life.

Brian Leslie
Editor,
Sustainable Economics
www.sustecweb.co.uk



Are our BBKA leaders acting like the villagers? Are they spending their time gaming the markets and talking to lobby organisations, just like trying to pull bodies out of the river and not being able find an answer to the problems we beekeepers face?

Until we 'walk upstream' and see what is causing the slaughter of our bees we will not be able to come up with any answer which will help preserve bees, beekeeping and food production for future generations and human life on this planet.

David Ashton, via email

Environmentalists know thyself

Regarding Miguel Mendonça's comment 'The wave theory' (October 2008); what are the priorities and possibilities? First of all, those motivated to work for change must be more

effective. Individuated people should engage others at every opportunity, in a didactic, 'take it or leave it' approach.

The stumbling blocks which hold back progress socio-politically are psychological – not technological. The psychology of our socio-political structure is what stops us effecting change efficiently and expeditiously. The hard won battles against the established rent collectors and financial/political movers and shakers are lost from the start due to the way 'changes' are put in place by those who are in control. Moreover, many in the green camp, as with feminists, are fakes. They take on the green sheen for economic and socio-political purposes. The way forward is for genuine people to concentrate their efforts in gaining a comprehensive understanding of society.

Jacob Jonker
Hobart, Tasmania, Australia

Send letters for publication to: Letters, the Ecologist, Unit D102, 116-118 Commercial Street, London E1 6NE. Email: letters@theecologist.org. The Ecologist reserves the right to edit letters as necessary.

GM games

Genetic modification is a serious issue with very questionable benefits concentrated on the few and major risks forced on a largely unwilling mass public.

The gene giants are powerful, unethical and wealthy. The mere idea of making this a possibility for untrained amateurs at home doing it to have fun (*Tech Reckoning*, October 2008) is nothing less than disturbing.

Andrew Muller
Sydney, Australia

Ecolabel confusion

I would like to take issue with one statement in the recent article 'Is turning to 30 degrees enough? Or should you be using an eco detergent?' (*Dilemma*, October 2008).

The article alleges that the EU Ecolabel 'does not exactly guarantee a high level of green credibility' since it permits some phosphates in detergents.

It is true that the EU Ecolabel allows phosphates in detergents, but only in very limited amounts and the phosphate criterion is just one of many other environmental impact criteria.

It is therefore over simplistic to dismiss the label on the grounds that it permits some phosphates in detergents.

What is important to remember is that the EU Ecolabel is a benchmark which is:

- Based on criteria by a multi-stakeholder group, not individual companies;
- Designed to be achievable by the 10-20 per cent best products on the market;
- Verified by a third party;
- Laid down in Community law.

The aim is not to promote one single best product, but to offer the consumer a choice of products that reach a specific, independently verified environmental standard. For products not bearing the logo, one cannot be certain.

The criteria for the EU Ecolabel are continually reviewed – work on updating the detergents criteria started in autumn 2008.

Pavel Misiga
European Commission
Brussels

ECOLOGIST POLL

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Q: Will 2nd generation biofuels be more environmentally friendly than the first?

62% Do not believe that the social benefits of tourism outweigh its environmental impact

Daily Life editor Laura Sevier replies: We applaud the fact that Ecolabel is trying to raise standards across the board. However the issue of phosphates in detergents is important (when flushed into the wastewater stream, phosphates stimulate excessive growth of algae in rivers, streams and lakes, starving fish and plant life of oxygen). Overall, it is estimated that phosphate detergents account for about 25 per cent of the total phosphorus loadings of water bodies in the UK. A report for the European Commission in 2006 identified the UK as one EU country in which a ban on phosphates in detergents would generate 'some benefits', alongside Greece, Cyprus, Estonia, Luxembourg, Hungary, Belgium and France. For people who want to use products that don't contain phosphates, the Ecolabel offers no such guarantee.

Creative learning

Nick Kettles' article 'Robotic children', (September 2008) brought a welcome passion to discussing the education young people need to grow up as 'creative, intelligent guardians of the earth' but bemoaned the lack of major initiatives by the government. In fact, one such initiative does exist. Creative Partnerships is now in its seventh year and has had its £35m annual funding renewed until 2011.

We have learnt a lot from our best practice in 36 pilot areas and are now spreading the programme across the country. Young people are getting to work on collaborative projects with artists, pursuing ideas that excite them and make them want to learn. Teachers report feeling newly invigorated about their work.

We know there is further to go. Reinventing schools as hubs of creativity is complex and takes time. The current crisis challenges us to explore this further: does the country need more creative thinkers or more 'creative accountants'?

It is not yet clear which side of the fence the government would truly prefer to fall.

And then there's the money question: when the cut backs come, will our work be seen as crucial or dispensable? Time will tell.

Nick Nuttgens, Creative Director
Creative Partnerships Sheffield/Cape UK
www.creative-partnerships.com

Cars are too inefficient

Much attention is given to alternative means of powering motor vehicles, to counter the efforts of global warming and peak oil. Whatever it runs on, a car is an inefficient means of transport in terms of space required and energy consumption, not to mention and danger and demand for destructive infrastructure and parking.

We need to return to local production and employment and where transport is required, minimise the use of road and air and restore our rail and tram networks to at least their former comprehensive coverage and role, including local freight facilities and the happy situation of everyone being near a service. We should also make more use of boats. We will then be able to enjoy quiet roads safe for cyclists, pedestrians and horse traffic.

Jonathan Delton,
Eastbourne

Information overload

Michael Bugeja's comment, 'Global Village Idiots' (November 2008) on information overload and ecology was timely except for his remarkable statement about the 'chains of religion' and ecological understanding. Has he never read Henry Vaughan or Thomas Traherne? What about the many 18th and 19th century parson-naturalists?

A sacral understanding of the natural world began to be undermined by the Renaissance and the Reformation, but it was the Enlightenment which issued in a narrow, mechanistic understanding of science that many leading scientists have fought against.

As for information overload, this was well described by TS Eliot in one of his Choruses from *The Rock* (1934):

*The endless cycle of idea and action,
Endless invention, endless experiment,
Brings knowledge of motion, but not of stillness;
Knowledge of speech, but not of silence;
Knowledge of words, and ignorance of the Word.*

D Taylor,
Exeter

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Sense about science

A Vision for Science and Society, in today's technological vista, sounds an honourable aim. **Guy Cook** reads between the lines of this new government paper

In an era of climate change, genetic engineering, biofuels and debates over alternative energy sources, nothing could matter more for the environment than the choices made by government and society between available technologies. So in principle, the recent government document *A Vision for Science and Society* should be welcomed by all those concerned.

Unfortunately, the promise is not fulfilled. The problem is inherent in the title itself. The document fails to address the key difference between science (which develops knowledge of the natural world) and technology (which applies that knowledge). While it claims to be about the former, it is actually about the latter. Though not discussed, the distinction is clearly accepted by the authors, who use the phrase 'science and technology' 24 times. One has to suspect the avoidance of this issue is a strategic choice for a government intent on ignoring legitimate, environmentally aware assessment of new technologies, positioning it as opposition to science itself. They are not the same thing.

The natural sciences pursue rational, objective, evidence-based, disinterested knowledge of the natural world. Their achievements are immense. Yet their strength and authority rest upon their own clear delineation of what they can and cannot do. To misrepresent these self-imposed limits is to undermine this strength and may weaken this authority. They do not consider the political, commercial, ethical, philosophical, social and aesthetic dimensions of decision making.

(This is not to say that scientists do not have wise contributions about these aspects of decision making – many clearly do – nor that scientists do not study the philosophy and ethics of science.) Thus, for example, science can tell us what will happen when a nuclear bomb explodes, but not whether countries are right or wrong to have nuclear weapons. That decision must consider other criteria. The British Government's decision to maintain Britain's nuclear-weapon capability – an instance of a policy informed by science – is a political rather than a scientific one.

Once the science and technology is

Guy Cook is professor of language at the Open University and co-edits *Applied Linguistics*



confused, it is easy to characterise opposition to a technology as deriving from lack of scientific knowledge, or antagonism towards science. Although the document wisely acknowledges the fallacy of the 'deficit view' of the public understanding of science – by which opposition to new technologies is attributed to ignorance and prejudice to be remedied by science education – it does not put this principle into practice. Throughout the document, the overwhelming emphasis is upon the 'need for all citizens to understand the nature of science better', but not on the corollary of this exhortation: the need for those applying scientific knowledge in new technologies to understand better the nature of social, economic, political, ethical and philosophical factors in their decision making.

This is not to deny the supreme importance of developing public understanding of science, but to acknowledge that there are many more dimensions to decision making. New technologies and their implementations encounter legitimate ethical opposition, alter employment opportunities and patterns, redistribute wealth, affect markets, have psychological effects, change political processes. For these reasons, the voices of experts other than natural scientists and of all citizens who have views, should be heard. Though we are told that 'since 2000 the emphasis on public engagement has been on two-way dialogue', there are no details in the document

of how scientists and technologists might listen to other kinds of expertise, or to the public more generally. Nor is there any suggestion that a new technology, though scientifically informed and viable, might not be adopted in the light of consultation. The aspiration to 'two-way' communication is

simply not borne out. We are told 'national policy consultations can be opportunities for mass public education about science and associated issues'. But education – though desirable – is not the same as consultation.

From the outset, the report makes assertions and begs questions. Its simplistic opening sentence 'science improves the quality of daily life' sets the tone. Few would disagree that technologies such as dentistry, lightening conductors, and vaccination have improved the quality of life. Yet in the case of other technologies, such as weapons of mass destruction, the opposite is true. The problem for policy makers is not such simple extreme cases, but those where there are substantial and rational arguments on both sides. The document does not however offer details of how such technologies are to be assessed. While understanding of the science is an essential and major contribution to such decisions, it is not and should not be the only voice. To make it so, is both detrimental to science itself, undermining its independence and neutrality, and to other legitimate voices which should have a much greater share in the debate.

Although the government asked for comments on the document, and set up online mechanisms for their submission, the website (<http://interactive.dius.gov.uk/scienceandsociety/site/>) now seems only to showcase those comments supporting its line.

What is needed is not a one-sided vision or a fake consultation, nor the use of a misrepresented science to browbeat those with legitimate arguments into submission. Government thinking itself needs to take a lesson from the natural sciences and aim for precision, clarity, assessment of evidence, and an open mind about what it will find out. On that basis, there could be a genuine consultation in which, while science is applauded for its advancement of knowledge, the implementation of that knowledge is subjected to thorough critical assessment and scrutiny.

Nothing is more important for the environment than policy on technology. In this bland 'Vision,' an opportunity has been missed. It is hopelessly partial – in both senses of the word. It demeans science, patronises society, and also bodes badly for the future of the environment.



What is needed is not a one-sided vision or a fake consultation, but precision, clarity and an open mind

The economics of Heathrow's third runway may well force the Government into doing the right thing for the wrong reasons

Accidental heroes?

Willie Walsh, CEO of British Airways, whose company profits have been crashing over the past few months, says his airline is battling 'the worst trading environment' his industry has 'ever faced.' Michael O'Leary of Ryanair predicted 30 airlines would have gone bust by Christmas. Easyjet's Stelios put it best – 'We are not Aldi or Lidl. It's very difficult to stop eating in a recession but you can stop flying.'

Given the economic downturn and the particularly vociferous impacts it's already having on the aviation industry, it should come as no surprise that *The Economist* recently used its lead editorial to join calls for a rethink over the Heathrow expansion saying, 'circumstances have changed and [the government] needs to act accordingly.' Even the former boss of British Airways, Bob Ayling, wrote months ago, 'A third runway at Heathrow is against Britain's economic interests.'

Even using the Department for Transport's (DfT) own cost-benefit analysis, but factoring in Stern's, as opposed to Defra's, figure for the 'shadow price of carbon', economists have calculated that rather than being of net benefit to the economy, a third runway would lead to economic losses of about £5 billion – and that's using cheery economic forecasts! To steal a phrase from the former government chief scientist, Sir David King, if new runways are approved during this recession, they will turn out to be 'white elephants.' After all, what happens when you set those DfT growth forecasts against the context of what Nobel economics laureate, Joe Stiglitz, predicts will be 'the deepest and longest downturn in the last quarter century and almost surely, since the Great Depression'? One senior government apparatchik told me, 'the financial services industry is no longer central to the British economy.' Yet Heathrow expansion was always about 'the City' and the 60 per cent of those using Heathrow who are business passengers. So what of those arguments now?

The Sunday Times reported that a poll of British business

Joss Garman is an environmental campaigner and journalist



leaders found that 95 per cent believe a new runway would 'not make much difference' to their companies. In contrast, nobody now seriously doubts the environmental case against airport expansion. It remains overwhelming. Just last month Professor Kevin Anderson from the world-respected Tyndall

Centre for climate change research presented a report to The Royal Society which said, 'the urgency with which the (aviation) industry must make the transition to a low-carbon pathway leaves no option, but to instigate a radical and immediate programme of demand management. There should be a compete moratorium on airport expansion.'

He was talking about climate emissions, but local air pollutants from Heathrow are already dangerously high too. With 1,000 premature deaths a year in London already because of poor air quality, the Government's own Environment Agency says that a new runway 'will result in increased morbidity and mortality impacts.' Indeed, the EU Environment Commissioner said explicitly expansion would lead to a breach of European air pollution law.

I've always argued that these scientific cases should and would be enough to stop BAA's plans. However, as Geoff Hoon this week knocked back the Government's decision for a third time, it struck me that, for Labour, only the economics count and that's probably what's caused a

double-take. Sure, Ministers must also be pretty worried about the 57 Labour MPs who have signed a motion against the runway and the stream of West London MPs putting in calls to Number 10 arguing their marginal seats are on the line. Ultimately though, for Gordon Brown, it's the economics that is causing the wobble.

For years, the Green movement has been discussing whether or not Brown 'gets' climate change. It seems like a simple enough concept for someone who can allegedly run the UK economy, but all the evidence seems to point in the opposite direction. 'This planet has, or had, a problem, which was this. Most of the people living on it were unhappy for pretty much of the time. Many solutions were suggested for this problem, but most of these were largely concerned with the movements of small, green pieces of paper, which is odd, because on the whole, it wasn't the small, green pieces of paper which were unhappy,' Douglas Adams wrote prophetically.

If Heathrow is cancelled to save money, rather than millions of lives, then we have our answer; the government's ignorance has put it into a position where it can only do the right thing by accident.



Heathrow was always about 'the City' and the 60 per cent of those using Heathrow who are business passengers



The winning argument

Hers was a landmark victory against the Government. Campaigner **Georgina Downs** on the importance of setting a policy precedent on pesticides

Against all the odds, I recently won my landmark High Court action against the Government over its failure to protect people in the countryside from exposure to toxic pesticides sprayed on crops.

This case was based on a set of core arguments that I identified and had been presenting to the Government over the last seven years. It was obviously a very significant ruling for the millions of residents throughout the country who, like myself, live in the locality of pesticide sprayed fields.

Mr Justice Collins was in 'no doubt' that the Government has been acting unlawfully in its policy and approach, as it does not comply with the relevant EC Directive regarding the authorisation of pesticides. That directive requires that before a pesticide is approved for use, it is established that there will be 'no harmful effect' on human health. This must apply to all the necessary exposure groups, including residents.

However, the Government's only method of assessing the risks to public health from crop-spraying is based on the model of a 'bystander', in which it assumes that there will only be occasional, short-term exposure to the spray cloud at the time of the application only, from a single pass of a sprayer and to only one individual pesticide at any time.

The judge agreed with my long-standing charge that this bystander model does not address residents who are repeatedly exposed, from various exposure factors and routes, to mixtures of pesticides and other chemicals, throughout every year, and in some cases for decades. The fact that there has never been any assessment of the risks to health for the long-term exposure for those who live, work, or especially go to school near pesticide sprayed fields, is a scandal considering that crop-spraying has been a predominant feature of agriculture for longer than 50 years.

Under EU and UK law the absence of any risk assessment means that pesticides should never have been approved for use in the first place for spraying near homes, schools, playgrounds and other public areas.

Adverse health effects from exposure to pesticides

Georgina Downs of UK Pesticides Campaign has spent seven years fighting to change Government's pesticides policy



are recorded in the Government's very own monitoring system every year, and include acute effects such as rashes, itching, sore throats, burning eyes, nose, blistering, headaches, nausea, stomach pains and burnt vocal chords, among other symptoms. These acute effects are regularly reported to me by rural residents from all across the UK.

Therefore, the Government, the Pesticides Safety Directorate, and the Advisory Committee on Pesticides were all fully aware that these adverse health effects have continued to be reported, but wrongly accepted such effects as not being 'serious'.

Also by allowing acute effects to be considered acceptable, the Government is then also allowing the risk of chronic illnesses and diseases, which can increase when acute effects repeatedly occur as a result of long-term cumulative exposures.

This has been recognised previously by the European Commission which acknowledged that 'long term exposure to pesticides can lead to serious disturbances to the immune system, sexual disorders, cancers, sterility, birth defects, damage to the nervous system and genetic damage.'

I spent much of last year working on my legal case and after re-reading approximately 3500 pages of documentation that was before the Court, I submitted a 149 page Witness Statement which provided the critical evidence for the case.

This evidence showed quite clearly that the Government has knowingly failed to act, has continued to shift the goalposts, cherry-picked the science to suit the desired outcome and has misled the public, especially rural residents, over the safety of agricultural pesticides sprayed on crop fields throughout the country.

The UK Government's

relentless and extraordinary attempts to protect the industry as opposed to people's health has been one of the most outrageous things to behold in the last seven years of my fight.

This is especially apparent at the moment, as not content with not protecting its own citizens the UK Government has been trying to scupper new European pesticide proposals from having the primary focus on health protection of citizens across Europe, to one of primarily protecting the industry.

There is also a clear case of double standards here. For example, the Government's response to the threat of a chemical terrorist attack would be first and foremost to protect its citizens. However, the spraying of toxic pesticides all over the countryside and the poisoning of the public is directly under Government sanction.

The most important action that must now be taken is to ban crop-spraying around homes, schools, children's playgrounds and other public areas. Considering studies have shown that pesticides can travel in the air for miles then the distance of the no-spray area would need to be substantial.

While it may not be possible to reverse the damage that has already been done to many people's health following exposure to pesticides, the situation will only become even more dire if radical changes in the UK are not made now. There has already been decades of Government inaction, as the Government has continued to allow the industry to set the agenda when it comes to pesticides. This cannot continue.

The Government should now be admitting that it got it wrong, apologising, (especially to all those residents whose health and lives have been affected) and actually getting on with protecting the health of the citizens in this country.

Instead, the Government's recent decision to appeal this ruling continues to demonstrate the Government's absolute contempt for rural residents and communities and is a disgrace.

Heads should be rolling, following such a landmark High Court Judgment, but instead its 'business as usual' with the Government's relentless attempts to protect the industry as opposed to the health of its citizens abundantly clear.



The most important action that must now be taken is to ban crop spraying around public areas

Behold the economic paradigms of the 20th century fighting for their lives, says **Richard Heinberg**

Clueless economists

A hundred years ago, markets ruled: fortunes were made, workers abused, bubbles blown. The Austrian School of economists, led by Ludwig von Mises, said this was fine: despite temporary messiness, the market knows best.

But the messiness of markets was unacceptable to socialists, some of whom led a revolution in Russia to establish the first state-controlled, planned economy.

The catastrophes of the Great War and The Great Depression led to the ascendancy of John Maynard Keynes, who argued that even capitalist economies need regulation to avert manias and subsequent implosions.

Keynesianism then reigned, as Britain, the US, and most other countries adopted regulations on banking, finance, and industry, in many cases nationalizing railways and other central features of the productive economy.

Meanwhile, rival economist Friedrich von Hayek quietly plotted the Austrian School's revenge, the occasion for which was offered by stagflation and labour unrest in the 1970s. Von Hayek, who had toiled in obscurity, was now the man of the hour; his acolytes Margaret Thatcher and Ronald Reagan promised to show the way back to prosperity: government was the problem and privatisation the solution!

The ensuing three decades have seen economists crowding back to the 'Let Markets Rule' side of the ship, as they giddily praised the wonders of globalisation and free trade.

Since the Collapse of 2008, economists are rushing to announce a new era of neo-Keynesianism: lack of regulation in the finance industry has led us to the brink and only

Richard Heinberg is a Senior Fellow of the Post Carbon Institute and author of *Peak Everything*



massive government intervention can put us back on track.

Sadly, this time the tracks are gone. The great economic paradigms simply took too much for granted. They assumed that economies run on money and labour, but ignored the roles of energy and ecosystems. They assumed that because popula-

tion, resource extraction, and available energy had grown throughout the 19th and 20th centuries, they would grow in perpetuity once the proper relations between money, market forces and government regulation were worked out. Almost no one stopped to think that limits to Earth's atmospheric carbon sinks and supplies of fossil fuels, topsoil and water might impose ultimate limits on economic activity.

The fields of ecological economics and biophysical

economics have sprung up to fill in this blind spot of conventional economic thinking, but both are currently marginalised.

In the months ahead we will see a titanic battle over who can

restore the beatific condition of perpetual growth. Sadly, neither free marketers nor state controllers have the answer. Humanity has reached physical limits to growth — peak oil and climate change — that spell ruin to all economic philosophies that fail to take such limits into account.

How long will it take the theoreticians to figure this out? How much of our remaining wealth will they destroy in a futile attempt to prove their paradigms eternally true? How far will society unravel before someone in charge begins to question the received wisdom?

Best hopes for quick learning.



In the months ahead we will see a titanic battle over who can restore perpetual growth

GOOD BUY WORLD

PETER RIGG



Inconvenient truths

Climate change will widen the north-south divide, making the north richer and the south poorer. **David Lempert** and **Hue Nhu Nguyen** point out an awkward fact

If you read the international press, it is easy to be convinced that the international 'debate' about global warming is about whether international organisations and country governments are able to 'wake up' to alarming news about the future of the planet. But if you

actually read between the lines of the analyses done by the IPCC

(Inter-Governmental Panel on Climate Change), there is a different 'truth' that is convenient to the major countries of the 'North.' Despite leaders' claims of attention to 'solving' this 'global' problem, they actually have everything to gain from global warming and seem to actually want it.

We took the best evidence available for impacts on agriculture, on trade routes, on flood damage, on migration, on resource extraction (as impacted by climate) and on health and disease and analysed it.

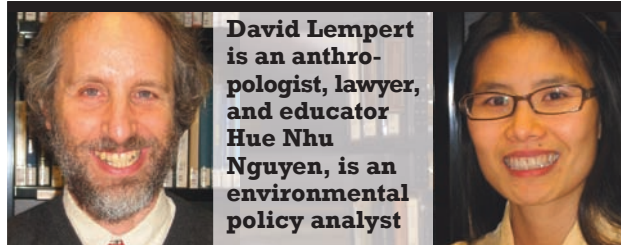
What we found is that in a world divided by the wealthy countries of the 'North' and the poor countries of the global 'South,' climate change will make the 'North' warmer and richer and the 'South' poorer in a way that reinforces the current imbalances of power.

The biggest winner from global warming is going to be Russia, turning its frozen north into arable land and lowering the cost of resource extraction while also opening up new sea lanes for trade through the North Pole. This is one of the reasons why Russia has been comparatively silent on this debate. Canada will benefit in a similar way.

China too is going to benefit. Even though tens of millions of Chinese may be displaced from the southern part of the country, there will be benefits to the north and weakening of their neighbours that should allow China to expand its power.

The other major powers, the US, Europe and Japan will have some dislocations of population and industries, but the overall costs will likely wash out.

The biggest losers from climate change, in every way, are the same peoples who are always at risk; Africa, Latin America, Southeast Asia, India, and the Pacific Islands.



David Lempert is an anthropologist, lawyer, and educator Hue Nhu Nguyen, is an environmental policy analyst

It is here where millions of peoples will be flooded from their homes and lose their livelihoods. Minority cultures and indigenous peoples will be hit hard, forcing assimilation and possibly extermination of cultures; requiring a rapid and distorting change if they are to physically survive.

Given that most of the major powers have likely done their own calculations, why are they not available publicly and why the apparent concern and rhetoric about climate change as a shared global problem? Perhaps it is no accident that the United Nations Framework Convention on Climate Change and IPCC offices have asked countries to do analyses of impacts on their own countries and have not sought to collect and publicise these country analyses.

It seems as if the major powers have co-opted the dialogue in an attempt to buy off the losers with a scheme that they can control, that also hides the calculations of the costs and benefits.

Rather than take the approach that a court would take, measuring the benefits and losses of different parties and then redistributing them so that everyone remains whole, the approach of the international community is one of 'carbon trading' that sends some

compensation to poor countries in ways that slow the changes by charging the countries that release more greenhouse gases.

Meanwhile, it seems a safe bet to assure that the

countries benefiting economically from global warming will also use their increased revenues to increase their military spending, to control national and international security threats. With climate change certain to lead to instability within countries and between them, there will be an argument for legitimis-

ing increased military interventions that will (at least for a time) reinforce current imbalances of power between North and South.

The real motive for the greening of industries is driven by economics – the costs to them of accessing and controlling resources – and of pollution in those countries, with little global concern for the overall

planetary environment.

For those in the developing world, who will have to deal with these truths, it is time to realise that the current global discourse isn't evidence of a new concern among wealthy countries for a common destiny of the planet and for the world's poor. The major powers are not the 'friends' of poor countries on this initiative. Similarly, China, while claiming to be one of several poor countries whose per capita consumption should be allowed to increase to that of other major powers, is not promoting this interest on behalf of all of the world's poor, since this change is likely to be to China's benefit and at their expense.

Sale of resources by poor countries to seek to quickly increase their relative position – such as oil sales by Cambodia or Azerbaijan – will likely worsen their overall position in the long run by promoting the environmental changes that will help to impoverish their peoples. Similarly, attempts to quickly modernise and increase consumption in developing countries other than China will help to reinforce the global changes that will keep developing countries poor and weak while also destroying their cultures.

The best strategy for 'developing' countries is to try to put aside regional differences now and to collectivise as alternative power blocs against the major powers. The world's native peoples must continue to organise as a bloc for the enforcement of international law, since they are at an accelerated risk of disappearing as a result of climate change. It is in their interest to seek to maintain their traditional systems and keep their patterns of consumption low as a way to slow global warming and their vulnerability to it. At the same time they may have to consider (unfortunately) investing what they can in the technologies of defence and power that they can use to force change in the developed countries.



The major powers have co-opted the dialogue to buy off the losers with a scheme they can control

The next big hit fuelwise will have corporations falling over each other to claim plant life, but the comedown could leave us in a sticky mess

The sugar rush

What runs our economy after oil? How about sugar? All those acres of corn and cane being liquefied into biofuels – that's sugar replacing oil. Those bioplastics that your food now comes wrapped in: sugar. By 2015, the chemical industry expects that a fifth of all its production of chemicals will be based on sugar.

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As petroleum (fossilised sugar) becomes less accessible, the new feedstock of choice for our industrial system appears to be the white stuff. Or more precisely the green stuff – because the type of sugars you and I put on cornflakes is only a fraction of what is being eyed up for fuels, plastics and chemicals production.

This new sugar-fuelled economy is being labelled 'the new bioeconomy' and at a glance, the opportunity seems huge. Looked at from space, the Earth is after all a sugar-coated planet. If you were to boil down all the green parts of the picture – the forests, the prairies and the blooms of algae – you'd find that most of what you were left with (about 75 per cent) would be sugars: a mix of carbon, oxygen and hydrogen atoms arranged into glucose, sucrose, xylose, galactose, mannose, arabinose, hemicellulose and cellulose. Cellulose in particular is the most common organic compound on Earth. About 33 per cent of all plant matter is cellulose (in wood that figure is 50 per cent, in cotton, 90 per cent).

The problem with cellulose is that it usually comes bound up with a hard-to-breakdown fibrous substance called lignin. As a result, there is now a concerted effort underway to liberate the world's cellulose from its lignin captor. Biotech companies such as Genencor, Novozyme and Verenum are developing powerful new enzymes, known as cellulases, which will munch through



The new green gold of this sugar economy is plant biomass – whether wood chips, prairie grasses or leftover corn stalks

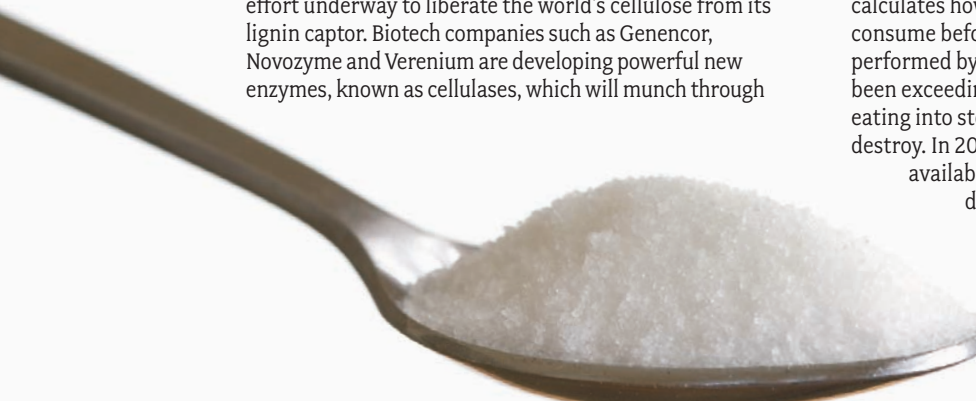
lignin so that cellulose can be fermented into fuels and plastics. Synthetic biology researchers are building designer bugs that will turn ligno-cellulosic material directly into high value chemicals. US and European research money is pouring into designing sugar-platform factories, known as biorefineries that, in time, might

transform cellulose and lignin into almost any chemical compound you care to make.

Of course, the new green gold of this sugar economy is plant biomass – whether wood chips or prairie grasses or left over corn stalks on fields. That which was previously considered worthless plant trash is now a potential source of high value fuels, chemicals and plastics. Expect to see a concerted corporate grab on plant-life in the coming years – on forests, seaweeds and set-aside farmland. For industry, the coming switch to cellulose represents an opportunity to commercialise the 76 per cent of the earth's plant matter grown every year that has not yet been appropriated for human use – a large new source of capital.

Which begs the question: do we want to see the chemical and fuels industry lay claim to all of the world's living plant matter? What looks like a gleaming industrial opportunity will be sold as a green lifestyle option, but may in fact be an ecological disaster. It would be wrong to portray that 76 per cent of uncommodified plant-life as 'unused'. Far from having a surplus of plant matter we may in fact already be well overdrawn. Those 'unused' forests clean our air and water, algae regulates our climate and crop waste rebuilds our soils. Every year the Global Footprint Network calculates how much new plant-life we can afford to consume before destroying the ecosystem functions performed by those plants. Since the mid-1980's, we have been exceeding the carrying capacity of the Earth and eating into stocks of plant-life that we cannot afford to destroy. In 2008, we had used up all the new plant-life available to us by September 23 – a date ominously designated 'Earth Overshoot Day'.

Unfortunately, Earth Overshoot Day is coming earlier every year and with the advent of the sugar economy the term 'overshoot' may prove too benign. As any sugar addict can tell you, after the sugar rush there's always the sugar crash. If Earth's overshoot gives way to a planetary sugar crash, we might rue moving our economy from petroleum to sugar as switching from one unsustainable feedstock to another.



Chainsaw massacre

Forest carbon finance, through avoided deforestation, is at best a sticking plaster solution that fails to get to the roots of the problem, argues **Harriet Williams**

In the time it takes to read this article, more than 600 acres of tropical forest will be destroyed. In the next 24 hours, another 137 forest species will become extinct. The rest is vanishing at a rate of 13 million hectares a year – an area six times the size of Wales.

The spoils will be carried off in the form of vegetable oils, minerals, beef and other commodities, harvested from the scorched plantations of South America and Asia, destined for the tables and fuel tanks of rich first world consumers. In Africa, the proceeds are often taken in non-monetary form by the poor, as food, fuel and building materials required to eke out subsistence lifestyles.

This chainsaw massacre compromises the forest's ability to fulfil its most important roles – as home to indigenous peoples and the world's richest biodiversity, protector of regional watersheds and regulator of the global atmospheric system. Indeed, deforestation contributes about one-fifth of anthropogenic carbon emissions – more than the world's transport sector combined.

The rainforests' myriad ecological and cultural services are literally priceless, in both senses of the word. As far as conventional economics go, sustainable management, which offers only a few shade-grown coffee beans for income between excruciatingly slow timber yields, is an unattractive prospect. Far better to fell trees for timber and convert the land to more lucrative use. This maxim has held true since humans first became capable of organising large-scale deforestation.

Indeed, by late medieval times, Europeans were on the brink of a fuel and nutritional crisis, such was their efficiency at clearing trees and eliminating vast numbers of wild game.

The great forests of Europe and North America are long-gone, of course, and the developed world now finds itself in the position of entreating forested nations of the South to preserve what's left. Every few years, the international community comes together to conjure up a cure, though none of these solutions have succeeded thus far. Developed nations are wary of interfering with special interests, such as the mining, agricultural and finance sectors whose

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operations often lead to new swathes of deforestation. There is a preference for centrally managed schemes with a starring role for the World Bank, itself a long-term sponsor of forest-wrecking infrastructure projects. This often precludes the active involvement of communities who actually live in the forest. No government, rich or poor, has much appetite for tackling the political failures that underlie deforestation – chronic corruption, weak institutions and uncertain land rights among them. And any question of managing demand is off limits. Consumers must be entitled to as many palm oil cosmetics or rainforest beefburgers as they like – developing countries must supply all this and supply it sustainably.

With so many core issues related to the supply and demand of forest products swept aside, the history of international attempts to stop deforestation is one of well-funded failure. The Tropical Forestry Action Plan, hatched by UN agencies and the World Bank, is a case in point. Launched in 1985, TFAP promised sustainable development but in reality looked more like a welfare plan for the tropical timber industry. Despite throwing millions of dollars at the problem, deforestation rates continued to soar.

Fast forward two decades and calls to curb deforestation have acquired ever greater urgency thanks to climate change. So it was that action on forest loss took centre stage when

governments gathered in Bali in December 2007 to discuss a post-Kyoto climate deal under the auspices of the UN.

For market-minded pundits of all stripes, the re-definition of forests as a climate problem is a dream come true. The trouble has always been that forest is worth more

dead than alive. By attaching a price tag to trees as sticks of carbon, living forest can be ushered into the safety of the market-place via the growing international trade in carbon emissions. So long as carbon is more profitable than palm oil or timber, the trees will remain standing, or so the theory goes.

At face-value, turning carbon into a tradeable commodity would seem an elegant cure, and has powerful fans in governments, financial institutions and carbon consultancies. Thus the stage is set for the UN climate summit in Copenhagen this December, when negotiators will look to strike a global deal on reducing forest emissions, with richer northern countries to pay the poorer south for income foregone by avoided deforestation.

But not everyone welcomes forests into carbon markets. Brazil, for instance, rankles at the implication that rich countries will be able to balance carbon budgets by buying up foreign forest, instead of cleaning up their own homes, transport and industry. The European Commission worries about the integrity of the EU Emissions Trading Scheme, which could be destabilised by a sudden influx of cheap forest carbon. Proposals for alternative sources of finance abound, including aviation taxes and public funds.

With the clock ticking towards Copenhagen, governments have proven willing to talk up new sources of finance, but reluctant to ditch the old formulas for spending it. The World Bank is positioning itself as a major conduit of forest carbon finance, although questions remain over its ability to manage such funds equitably and sustainably. Forest peoples are once again marginalised. And the whole process remains perilously disconnected from many factors outside the forest sector – the world of perverse subsidies, trade policy and low-cost consumption – that actually drive demand for deforestation.

Monies for curbing deforestation need to do more than flush straight through the system. Environmental and development groups must be supported in the next crucial months, as they push for the final deal to recognise political realities via strong criteria on the structure and allocation of avoided deforestation funds.

Raising the money is likely to prove the easy part. The far greater challenge, lies in spending it wisely.



The rainforest's ecological and cultural services are literally priceless, in both senses of the word

SUBVERT



The weaker sex?

A recent report by the charity CHEMTrust – which drew on more than 250 scientific studies from around the world – revealed that males of nearly every species – including fish, amphibians, reptiles, birds and mammals – have been harmed by ‘gender-bending’ chemicals in the environment. These chemicals come from pesticides, food additives and wrapping, flame retardants, cosmetics and pharmaceuticals.

In mammals, genital disruption in males, has been widely reported and includes: small penis; small, undescended or abnormal testicles; ambiguous genitals; or intersex features (such as egg tissue in the testes of the male). These findings add to mounting worries about the role of hormone-disrupting chemicals in the environment, and the

implications for human health and reproduction.

It has now been shown, beyond question, that mixtures of several gender benders can become a potent cocktail with each chemical increasing the potency – and therefore the potential damage – of the others.

You’d think our government – made up mostly of men, after all – would have the balls to do something about it. But during negotiations for the forthcoming EU pesticides regulation, the UK was one of just three Member States which refused to back tougher controls on hazardous (including hormone-disrupting) pesticides. Indeed Britain continues to oppose new regulations and ignore the importance of the ‘cocktail effect’.

Talk about a cock up...

Don't get back to work

How to deal with the job crisis? Try saving your soul by retreating as far as possible from the system that landed us all in this sorry mess

One of the many absurdities of the banking crisis is the way that governments and big business alike are still clinging on to the wreckage of the old system. Even while everyone is being told that the crisis was caused by indiscriminate and greedy lending and spending, the government is trying to persuade the banks to lend more and the people to spend more.

It's the same in the world of jobs. A 20 year-old wrote to me recently: why was the whole world telling her to get a job, when it is quite clear that there are no jobs and in fact there are going to be far fewer jobs as the months draw on?

In another horrible bit of government-led brutality, the sudden rise in unemployment is coinciding with a crackdown on so-called 'dole scum', those lazy, scrounging good-for-nothings so beloved of *The Daily Mail's* highly paid moralists. In the old days – I'm talking pre-1500 – these people were called 'the poor' and it was your charitable duty to look after them.

These days they are called welfare cheats. Recently the Department for Work and

Pensions employed a ridiculous academic (read ivory tower, not in touch with reality) to tell it what it wanted to hear when it comes to dealing with the poor:

'This group, before they are actually ready to actively seek work, would be expected to address debt, confidence or health problems, as well as taking on work and skills training. Young mothers might also be required to make inquiries about access to childcare in their locality.'

So, if they want benefits, they will have to work for them, or suffer. And the government wants something back for its meagre handouts even though these people are not exactly dining on oysters, lobster and fine claret. Have the six-figure salary, Ivy-dining tabloid writers who attack the single mothers on benefits tried living on £40 a week?

The authoritarian language used reminds me very much of another pro-work government which issued the following order, on 'dole scum': 'Work-shy elements within the meaning of this order are men who are old enough to work and who have recently been certified fit and who can be proved to have rejected offers of work on two occasions without just cause or

have accepted work only to abandon it again shortly afterwards without adequate reason.' The author was Heinrich Himmler, in 1936.

No, the answer is not to get a job, get a loan or spend more money. The answer is to retreat as far as possible from the system that created this mess. Retreat from capitalism. and paradoxically, you are far more secure than if you depend on it for your sustenance, entertainment and creative fulfillment. When you don't have a job, you can't be sacked.

I've done it myself. You must quit your job. You must embark on a strenuous round of cost-cutting. You must get rid of cars, cancel holidays. Did you know that your biggest annual cost is your job? Think about it. Add up the costs of your job. First there is tax and national insurance. Then there are the coffees, sandwiches, drinks after work, retail therapy costs, holidays, commuting costs, clothing costs and all the rest of the sorry palaver.

If you earn £30,000 a year, then about £20,000 of that is actually pure cost. This makes very bad business sense. Quit your job and save £20,000. Then rip up your credit cards. Switch all your suppliers to co-operatives: the Co-operative bank, the Phone Co-op. Avoid any shareholder-owned business like the plague. They are evil because they exist only to make profits for their shareholders. They are fuelled by greed. So that means no supermarkets. Instead buy food from small local shops or order wholesale from a Workers' Co-op like Suma.

The further you retreat from capitalism, the happier you will grow. Work part-time. Start a small business from home. And before a smart-Alec sixth-former writes in to say anti-capitalists do not start small businesses: yes they do. There is a difference between cooperative trade and competitive capitalism.

When you start to retreat from capitalism, other means of exchange start to open up. You swap your eggs for someone else's marmalade. You give people things and they give to you. You share things and buy in small groups. You have the time to help out on local committees.

The old system may or may not be dying. Either way it makes sense to escape from it as far as possible and create your own life.



The sudden rise in unemployment is coinciding with the crackdown on 'dole scum' – those lazy good-for-nothings so beloved of *The Daily Mail*



Tom Hodgkinson is the editor of *The Idler* and author of *How to be Free* (Hamish Hamilton, £14.99)

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