

ENVIRONMENTAL MAGAZINE OF THE YEAR
ECOLOGIST
NOVEMBER

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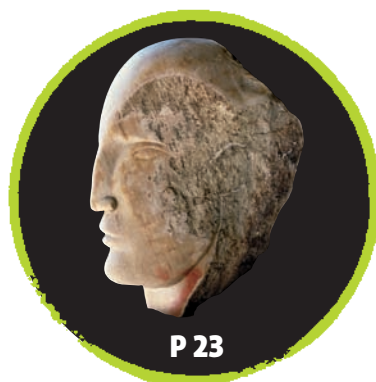
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**IS YOUR JOURNEY
REALLY
NECESSARY?**



RAILWAY EXECUTIVE COMMITTEE



Image montage KATARINA SOCHANEK
Photograph: ALAMY

Editorial

Here are your choices...

Doesn't time fly? Almost exactly a year ago, the Stern Review into climate change studied three scenarios for a world being driven by climate change: business as usual, stabilising CO₂ at 450ppm and stabilising it at 500-550ppm.

At 450ppm we had a 50-50 chance of avoiding the 2°C temperature rise that would send the polar ice caps into terminal meltdown, dry up the rainforests and raise sea levels enough to drive two hundred million people from their homes. At 500-550ppm we might mitigate some of the worst effects of a changing climate, but not escape them completely. Business as usual, concluded the report, would lead to catastrophe – economic collapse akin (in today's money) to the cost of fighting the two world wars and the 1930s stock market crash combined.

One year on and one of these scenarios – stabilising global CO₂ at 450ppm – is no longer feasible. That's how fast the science moves. As we go to press, internationally acclaimed climate scientist Professor Tim Flannery has pre-empted the release of the final instalment of the Intergovernmental Panel on Climate Change's Fourth Report, with the view that the full report shows that the level of climate-changing gases in the atmosphere has already edged past that critical level. Other eminent scientists, including the IPCC's chair, Dr Rajendra Pachauri, have chimed in in agreement.

These CO₂ numbers have been quoted so often you could be forgiven for thinking they are just so much meaningless scientific number-crunching. But these are the numbers that determine the future of every living thing on the planet. And once we cross over these numerical thresholds, we can't cross back.

Such news should focus the agenda for the delegates at the annual UN climate convention and Kyoto Protocol meeting in Bali this December. As they convene yet another meeting and try to reach consensus on

concerted global action beyond 2012, maybe the first question they should ask is: how do any of us act to prevent the situation becoming worse when it is already past a critical tipping point?

'Decisively' would be the only sane answer; yet decisiveness is continually sacrificed at the altars of economic expedience and consumer 'choice'. Why is industry allowed to set targets to reduce emissions within a leisurely 5, 10, 15 years? Why are energy-inefficient goods and gas-guzzling cars allowed on sale in this or any other country? Why are the rises in air passenger duty so feeble?

Here's the new bottom line. Having wasted years debating whether climate change was real, years tinkering with, but never committing to, renewable energy sources and a sustainable economy, and years redefining ourselves as 'consumers', we have built for ourselves a world where the Holy Grail of 'choice' has been smashed to the floor.

If we refuse to act immediately and without any further fannying about – politically, economically, individually – our only choices will be the kind of painful, terrifying ones about the future of the world's people that none of us want to think about, let alone make.

There will be no more shades of grey, no room for the luxury of political correctness, no self-indulgent hours to spend debating whether children's stories should only ever have happy endings. The stark choices we will face will be as black and white as: Who lives, who dies? Who will be allowed to be born, and who will not? Who eats, who starves? Who swims, who sinks? Who drinks, who is thirsty? Who sits in the shade, who burns in the sun? Who has heat in the winter, and who must we leave to freeze to death?

These are the heartbreaking dilemmas we will bequeath to our children and grandchildren unless we take positive, and effective, steps to turn things around.

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Letters



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MEAN GREENWASH

I was rather alarmed at the ease with which more efficient Boeing 787s were dismissed in your Greenwash 'Plane Stupid' (September). There is no doubt that the increase in the number of flights taken each year is a major concern, and this will not be offset by the increased efficiency of planes, but surely increasing the efficiency of travel is superior to preventing travel altogether? Not only is discouraging people from air travel unrealistic, but travelling has many benefits. Our economy would suffer if people were unable to travel for business. Many poorer areas rely on money from the tourist industry. Not to mention the benefits to the traveller of broadening their horizons and increasing their awareness of the world for which we are all responsible.

While I agree that this does not mean the problems of air travel are solved, it is a step in the right direction. Can an environmentalist really afford to call the millions of tonnes of carbon this represents 'a drop in the ocean'?

Rebecca Nesbit, by email

ALZHEIMER'S MERCURY LINK

Reading Oliver Tickell's comment on Alzheimer's disease ('Alzheimer's – the case for prevention', September), I was struck by the glaring omission of the major part that exposure to heavy metals, particularly mercury, has played and is playing in the explosion of this and other neurodegenerative conditions in our society.

Exposure to extremely low levels of mercury produces several of the distinguishing features of Alzheimer's disease: progressive mental deterioration, memory loss, confusion and memory changes.

Neurofibrillary tangles and amyloid plaques in brain tissue, found during autopsy, confirm an Alzheimer's diagnosis. Studies over the past 10 years have found that extremely low levels of mercury produce amyloid plaques and neurofibrillary tangles. A 2000 study, performed by Olivieri *et al*, showed that mercury increases the secretion of amyloid protein and causes hyperphosphorylation of a protein called 'tau'; both are markers for Alzheimer's. In March 2001, researchers at the University of Calgary used digital time-lapse

photography to document the production of neurofibrillary tangles in the brains of snails. After culturing the cells for 48 hours, the researchers applied a metal chloride solution of mercury to the cells' growth cones. Only mercury produced the damage that characterises Alzheimer's. A video of the experiment, *How mercury causes brain degeneration*, can be found online at www.apollo.ucalgary.ca/mercury/movies/Lor2_QTS_700kb_QD.mov

The main sources of mercury these days and in the past couple of decades have been primarily from dental amalgam fillings and ethyl mercury contained in vaccines (thimerosal – see www.putchildrenfirst.com for more information on this and its links to neurodegenerative disorders in children). Much

mercury has been removed from the children's vaccines, but is still present in booster doses and adult doses. The annual flu vaccine contains 25ug of mercury per dose and it has been said if you have a flu shot every year for five years your risk of Alzheimer's disease increases tenfold!

Large fish species are also contaminated, as the contaminants from the coal-fired power stations rains down into the oceans and from there migrate into our food chain.

Angela Walker, by email

FLOOD DEFENCES

I was astonished at your news item 'Floods in Cuckmere Valley' (October).

For decades the Sussex Wildlife Trust, along with other conservation organisations, has been endeavouring to persuade the Environment Agency to use natural processes and work with nature to achieve flood defence rather than build endless concrete defences. A fine example of a giant leap by the Agency in the right direction is the Cuckmere Valley.

The defences proposed by the ironically named 'Rescue the Cuckmere Valley' in your article would cause habitat loss as rare coastal habitats are squeezed up against their new defences, would increase flood risk upstream and leave no opportunity for the wildlife and environmental enhancement that would be achieved by the Agency's plan. In the long term these brave new defences would probably fail catastrophically anyway. The group wishes to increase the height of a canalised channel, adding to hard concrete defences, removing salt-marsh and taking away what little habitat coastal species have in that area.

In the process it would maintain an eyesore that prevents water running through the famous meanders in the Cuckmere Valley. Your report put forth the same old propaganda: how the whole area would flood, how it would be covered in mud, how the access would be taken away, how the landscape would be damaged, how wildlife would drown – all highly dubious statements that should not be left unchallenged.

In truth the Agency's plans are well thought through, have been properly modelled, have had extensive consultation, are supported by virtually all serious conservation organisations

Ecologist poll

Is the era of cheap energy over?

74 per cent of you thought that one person can make a difference

(government and non-government) and should deliver landscape, biodiversity and flood defence in a way that works with nature.

I agree with many of the *Ecologist's* complaints about the Environment Agency over other issues – but at least when it gets it right please give it some credit!

Dr Tony Whitbread

Chief Executive

Sussex Wildlife Trust

OFF THE BOTTLE

I was horrified to read Pat Thomas' article on bottled water ('Behind the label', September), which said that large conglomerates are able to 'buy up water'. How can this be allowed? I know that many governments are corrupt and fuelled by the greed that seems to be the hallmark of modern 'culture', but to allow any country to run out of water cannot be a vote-catcher! Water is our most basic requirement. If we are lucky and have it on 'tap', we accept it unthinkingly. Those who have to make long treks to obtain even the smallest amounts, often polluted, appreciate its value. For them to have this taken away by the preferred and ill-informed use of bottled water is beyond belief. I for one will never buy bottled water again – even if it comes from the local hills.

Deirdre King

Isle of Wight

ORGANISED SCEPTICISM

In school, in university and especially on quiz shows, we tend to see science as certainty. In fact, science is best seen as organised scepticism. The result, as we have seen with climate change, is a journey, over time, from uncertainty toward understanding, guided by experimental tests and sceptical questioning.

To put it another way: on any scientific issue there is, at any one time, what might be thought of as a landscape of opinion. In the early stages of research, various ideas are proposed, producing clusters of opinion, like little hillocks on the land. Questions are raised, observations noted and experiments designed to discriminate among possibilities, and some of the bumps shrink to zero; others attract support and grow. As things progress, we tend to find two or more 'schools' or hilltops, rarely of comparable size,

Daily dilemmas

In each month's issue, we ask a common ethical question that many of us ponder in our day-to-day lives, and people can go to our website and offer their suggestions as to how to answer it. In a subsequent issue we will publish the most practical and engaging selections in the letters pages.

Would you trade 40% of your salary for a happier life?

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with some growing and others fading. Ideally, over time, confident understanding emerges and appears as one tall, triumphant peak on an otherwise vacant landscape.

In practice, this rarely happens. Pockets of aberrant opinion may hold out, with proponents either ignoring decisive evidence or inventing ever more baroque ways of modifying their views to accommodate such facts. Such situations arise even more implacably if some fixed ideological position commits an individual to a position, transcending any data.

In general, however, the historical landscape of any major scientific question has its own evolution, from pimply plurality, through contending hillocks, to a single and narrowly spiky mountain in maturity. It is important – though often difficult – at each stage in the evolution of such a landscape to maintain a clear sense of its geomorphology. Unfortunately, the media's praiseworthy aim of always presenting a 'balanced' account can make it difficult to track such an evolving landscape. The temptation, whether in print, radio or TV, is to seek to present the 'two sides', as if reporting a sporting event.

Recent debates about the extent to which human activities – burning fossil fuels and putting greenhouse gases into the atmosphere – are causing global warming, as distinct from warming deriving from natural causes, is a case in point. Early warnings were suggested more

than a century ago. But we are dealing with a hugely complicated and nonlinear dynamical system, and even three decades ago there were very significant uncertainties associated with our quest for understanding. With computational power doubling every 18 months, things have greatly advanced since then, and the basic facts are now unambiguous enough to be agreed (though there remain significant uncertainties about the speed of some processes – ice caps melting, permafrost thawing, oceans becoming more acidic and so on).

The basic facts are now clear enough that in 2005 the G8 science academies, along with China, India and Brazil, asked that we 'identify cost-effective steps that can be taken now to contribute to substantial and long-term reduction in net global greenhouse gas emissions [and to] recognise that the delayed action will increase the risk of adverse environmental effects and will likely incur a greater cost'. These academies created the process of organised scepticism we call 'science', and their recognition that we are well past the point where we should doubt the serious consequences of climate change deserves attention.

Robert M May

Zoology Department

Oxford University

HOORAY FOR UGLY

Your feature on this ugly world of ours was long overdue: it's surprising the issue hasn't been aired more widely in the press. We are the architects of our lives and of the future. This all-pervading ugliness doesn't have to be: it is the tragic end result of centuries of trying to dominate nature. Because of this will to power, we have failed to take our proper place on this beleaguered planet of ours. We have lost touch with our beautiful inner selves and a sense of connectedness to all things. I believe that with a renewed sense of connectedness comes a sense of beauty and sacredness and hence the ability to enhance our smallest everyday actions with a deeper meaning.

We should all step back, shut our eyes and practise seeing ourselves through the eyes of the planet. Down with anthropocentrism!

Diana Korchien, via email

BROFISCIN

\$2BN PAY-OFF PENDING

THE ENVIRONMENT AGENCY MISSES OUT ON SHARE BONANZA

In a bid to stave off bankruptcy and draw a line under its environmental legacy liabilities, Monsanto is set to underwrite a \$2bn pay-off for those harmed by its past activities. Missing out on the bonanza is the UK Environment Agency, which, as the *Ecologist* has consistently maintained, failed to make a claim for damages over Brofiscin Quarry – where Monsanto dumped thousands of tonnes of toxic chemicals into landfill, knowing them to pose a long-term public health risk and environmental threat – and 11 other known sites in England and Wales.

Instead it signed a deal with Monsanto spin-off Solutia, to in principle agree that the chemical giant would assume liability for any remediation of Brofiscin, but allowing one of the world's most litigious companies to retain the right to launch legal challenges against any further claims.

While Solutia's plan to escape being broken up is by no means a foregone conclusion, as it needs to secure a \$2bn line of credit to underwrite its self-preservation share issue, it has been reluctantly accepted by many of its creditors.

The move illustrates the failure of the Environment Agency over the past 18 months to stake a claim for damages and fulfil its remit to make the polluter pay, despite being in possession of enough evidence to do so.

Meanwhile, representatives of the Agency and Rhondda Cynon Taf Borough Council (RCT), who share responsibility for the UK's most polluted site, have agreed to meet with concerned residents whose homes in Groesfaen, South Wales, overlook the former quarry. They have done so on the proviso that the press are not admitted.

Plans to invite Douglas Gowan – the expert eyewitness who exposed the deadly history of Brofiscin – have also had to be shelved. This despite the fact that documents and reports that both the Agency and RCT previously denied knowledge of continue to materialise. Among them are reports by environmental engineers concluding that the site poses a public health risk that needs further investigation.

• Is the Agency obstructing the course of justice? We address this question at www.theecologist.org/brofiscin in light of Viscount Chris Mills' decision to write to the press pre-empting the outcome of an internal investigation of Agency staff, stemming from a complaint by Douglas Gowan.



CONSULTATION GROUNDHOG DAY

Environmental groups had just 48 hours to comment on the Government document that has been used as the basis for the second round of public consultations on the future of nuclear power.

The Government was forced to re-run the consultation process after it was found to have pre-determined the outcome of its first review and not canvassed fully for alternative opinions, following a legal challenge by Greenpeace in February.

Yet now they are simply going through the motions, says Neil Crumpton, an energy expert with Friends of the Earth. First the Department of Trade and Industry emailed 'draft stimulus material' to the NGOs the afternoon before they were due to meet in Whitehall. The groups were invited to comment on the material – 'it was pro-nuclear opinion masquerading as fact' –

and printed submissions had to be returned by Tuesday morning, giving the groups one weekend to amend the paper.

Crumpton is sure that the material presented to the public by market research group Opinion Leader contained 'no belief in or understanding of non-nuclear technologies.

'There was no vision of what you would do if you weren't going to do nuclear,' he said.

EMFs INVISIBLE ASBESTOS

A scientist at the Government's Health Protection Agency (HPA) has said that there is a 'sound scientific basis' for restricting our exposure to radio waves.

Dr. Simon Mann, from the HPA's Centre for Radiation Chemical and Environmental Hazards told a conference in Warwick that 'extensive research' had revealed the biological effects of exposure to microwave radiation.

His warning came as a

European Environment Agency report concluded that current safety limits for microwave radiation exposure are 'thousands



of times too lenient', and that a delay in introducing restrictions could result in a health crisis comparable to asbestos or leaded petrol.

AIRPORT EXPANSION WHAT WARMING?

A UK airport has attempted to justify its expansion plans by challenging the science of climate change.

Gloucestershire Airport at Staverton issued an internal document entitled 'Common Misconceptions' to local MPs and Cheltenham Borough Councillors.

Under the heading 'Carbon

GO FIGURE...

33% of food contains measurable levels of pesticides. **16,306** endangered species are now threatened with extinction. Arctic ice is now **50%** per cent thinner than in 2001. Investing **£70m** in cycling could save the Government **£520m** in congestion and healthcare costs. A doubling in animal feed costs means the price of eggs will rise by **20p** a dozen. **40%** of Americans will only vote for a president who is committed to tackling climate change. **80%** of people distrust ethical business claims. The US coal industry uses **3m** pounds of explosives a day in mountain-top removal. Swedish nuclear reactor Olkiluoto is **24** months behind schedule.

Emissions', the author writes that claims that human activity can affect global climate 'have already been proven wrong due to the incorrect handling of physical data' and adds that scientists have made a mistake 'in their arithmetic'.

INCONVENIENT TRUTH OIL LINK TO CASE

The Judicial Review that has resulted in Al Gore's film *An Inconvenient Truth* being branded 'inaccurate' and 'alarmist' and 'politically partisan' was in all likelihood funded and encouraged by Exxon Mobil front groups.

The case was brought by concerned parent and school governor Stewart Dimmock, who is a member and council candidate of a new neo-liberal political group called the New Party and is funded by StraightTeaching, an organisation that 'intends to look into all aspects of the politicisation of education'.

In the background stands Robert Durward, who is on the policy committee of the New Party and is the head of the British Aggregates Association. He also founded the Scientific Alliance in 2001. This group exists to 'promote sound science in the environmental debate' – which parrots verbatim exactly what big tobacco called for when cancer was linked to smoking, and Exxon has called for during the

past decade over climate change.

That should come as no surprise, however, as the Scientific Alliance has previously hosted events with Exxon-funded luminaries such as Fred Singer and Sally Baliunas (see 'Unusual Suspects', *Ecologist*, April 2007)

CONSERVATION ISLAND HAVEN

The RSPB plans to flood Wallasea Island off the coast of Essex to



create a new wildlife haven, in what is being described as the biggest conservation project of its type in Europe.

The 'managed realignment' will involve breaching sea walls built to drain the saltmarsh for arable farming, and flooding 736 hectares of land with sea water. Within 10 years, the RSPB believes, the island will have reverted to the state it was in before draining began more than 400 years ago. Conservationists hope it will lead to the return of Spoonbills, which have not nested successfully on the site since it was 'reclaimed'.

FUNDING E-NUMBERED

A leading scientist with a key role in deciding whether E-numbers are allowed into children's food is

a paid adviser to Tesco and Unilever, the *Guardian* has revealed.

Toxicologist Dr Sue Barlow advises the EC on food additives, as head of the scientific panel of the European Food Standards Authority (EFSA), which receives UK funding. In May 2006, the EFSA rejected any link between the controversial sweetener aspartame and cancer, while Barlow was employed by a body funded by sweetener manufacturers.

Both Barlow and Tesco denied there was a conflict of interest.

Meanwhile a US study published in the *Critical Reviews of Toxicology* journal claims that aspartame is completely safe. The research, conducted by scientists at the University of Maryland, was funded by Ajinomoto, a worldwide manufacturer of aspartame.

EMISSIONS BIG POLLUTERS

Utilities RWE nPower and EDF Energy have come bottom of the class in two new reports published by WWF, which ranks the UK's power providers in terms of their impact on the environment.

The studies, carried out by international consultancy Innovest, scored the generators according to both their efforts to tackle climate change and their contributions to it.

nPower was specifically singled out for criticism, with the report finding that the company seemed to have failed to understand the importance of EU and domestic CO₂ reduction limits.

Centrica and Scottish Power scored highest, and were praised for work towards energy efficiency and investment in renewable technologies respectively.

For more information visit www.wwf.org.uk



LABEL UP

A campaign has been launched to persuade restaurateurs and pub landlords to provide detailed information on what goes into their food.

The 'Label My Food' campaign is driven by a wide range of groups including faith groups, environmentalists, allergy sufferers and those concerned about animal welfare.

'Our members want to be able to make informed choices about what they are eating,' said campaign founder Anthony Butcher.

Find out more about the campaign at www.labelmyfood.org.uk

BIG ASK

In his speech to the Labour Party Conference, Gordon Brown hinted that he may strengthen Britain's Climate Change Bill, increasing targets for emissions cuts from the current 60 per cent target to 80 per cent.

The announcement has given new wind to the Friends of the Earth-led 'Big Ask Campaign', which urges members of the public to write to their MPs demanding a strong Bill when it receives its second reading in Parliament at the end of November.

For more information about how you help show that an 80 per cent cut is the minimum acceptable, visit www.thebigask.com.

GREENWASH

FLYING HIGH

British Airways' in-flight magazine is launching an 'Eco-Worrier' column for those of you perplexed by green issues.

Who have they employed to sensitively consider these eco brain-teasers? George Monbiot? Michael Meacher? Vandana Shiva?

In fact, your questions will be answered by Willie Walsh, the airline's own Chief Executive, who was once quoted as saying, 'a reasonable man gets nowhere in negotiations.'

GLOBAL WARMING

BENCHMARK 450PPM HIT A DECADE AHEAD OF FORECAST

A leading climate expert has examined the Intergovernmental Panel on Climate Change's (IPCC) own data and concluded that atmospheric concentrations of carbon dioxide have already passed a critical threshold.

Professor Tim Flannery, scientist and author of *The Weather Makers*, told an Australian news channel that

levels of carbon dioxide in mid-2005 had already reached 455 parts per million – a level that it had not been expected to hit for a decade. 'We're already at great risk of dangerous climate change, that's what these figures say,' Flannery said. 'It's not next year or next decade, it's now.'

Continued economic growth in both the industrialised and less-

industrialised world had driven the accelerated emissions, he said, and his figures were 'beyond the worst case scenario as we thought of it in 2001.'

Last October, Sir Nicholas Stern's report on the economics of climate change looked at stabilising greenhouse gas emissions at 450 parts per million – which would give a 50-50 chance of avoiding dangerous climate change (see left) – but dismissed the target as economically unrealistic.

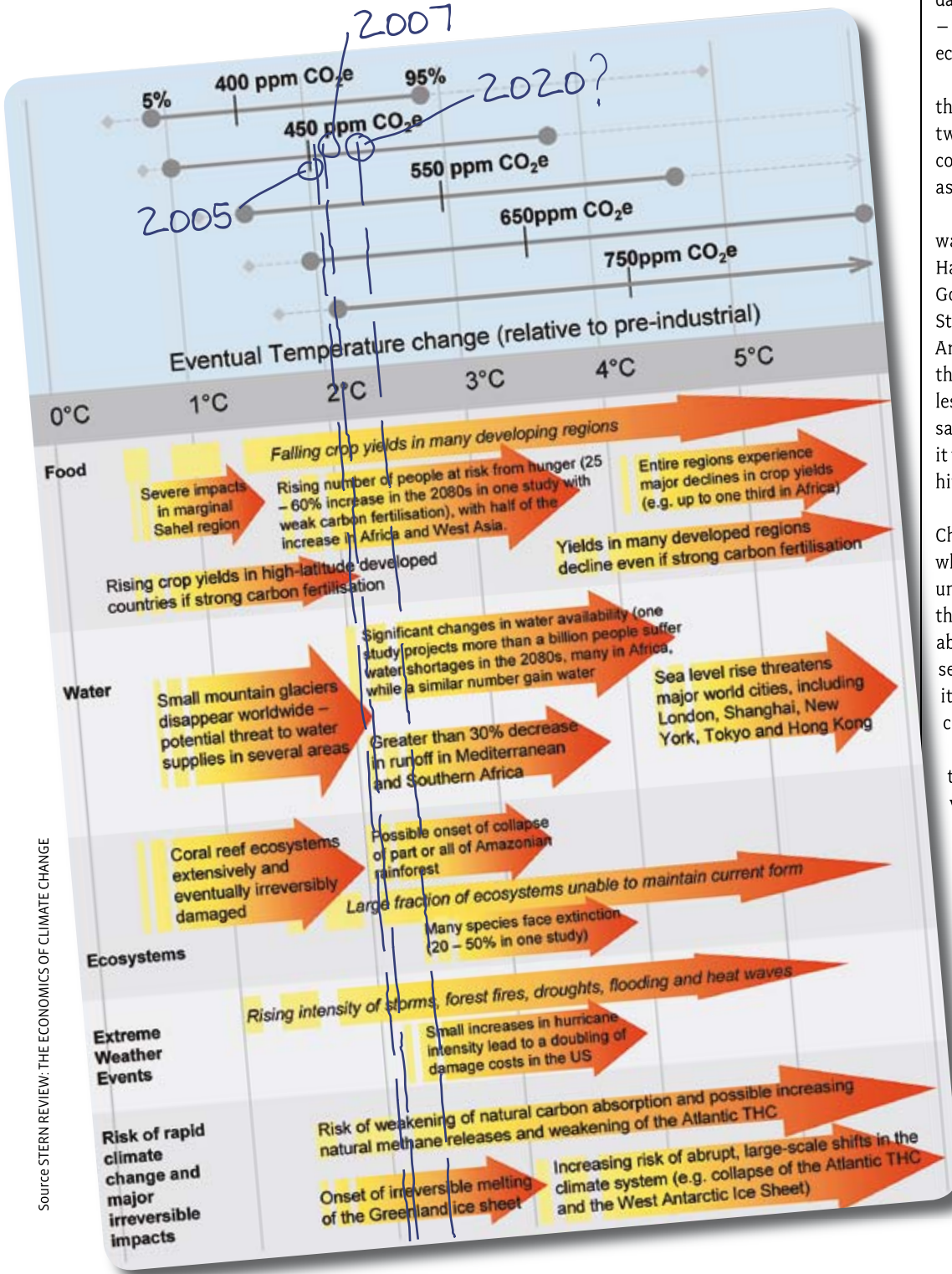
Flannery's figures suggest that this opportunity passed two years ago, and that today concentrations could be as high as 460 ppm CO₂.

More evidence of faster warming came from James Hansen, Director of NASA's Goddard Institute for Space Studies. Explaining the rate of Arctic ice melt this summer – the ice now covers 50 per cent less area than in 2001 – Hansen said: 'The reason so much of it went suddenly is that it is hitting a tipping point.'

And Dr. Rajendra Pachauri, Chairman of the IPCC, said that wheat production in India was in unexpected decline: 'Everyone thought we didn't have to worry about Indian agriculture for several decades. Now we know it's being affected now,' he told a conference on climate change.

The announcements came in the week that the first modern vessel begins an attempt to navigate the now ice-free North-West passage between the Atlantic and Pacific Oceans, and a paper by the Government's MET Office suggests that increasing levels of humidity will accelerate the progress of global warming still further.

In our Dec/Jan 2006 edition we identified that the figures used in the Stern report were out of date, and did not reflect the extent or pace of global warming.



SOURCE STERN REVIEW: THE ECONOMICS OF CLIMATE CHANGE

BIOFUELS DAMNED BY OECD

A leaked document from the Organisation for Economic Cooperation and Development (OECD) has condemned biofuels as being doubly bad for the environment.

The briefing paper for the EU Roundtable on Sustainable Development says that not only could the impact of biofuels be even worse than that of petrol and diesel, but that natural resources such as wetlands and pasture will be lost and food prices will rise for the next decade.

The OECD recommend that governments phase out their current support for biofuels, and that more attention should be focused on energy efficiency.

INDIGENOUS PEOPLE 'RIGHTS' VICTORY

At last – after almost 25 years of negotiations – 143 member states of the 192-strong UN General Assembly have adopted the Universal Declaration on the Rights of Indigenous Peoples, intended to guarantee the rights and sovereignty of indigenous

GREENWASH GRAIN OF TRUTH

Suncor Energy, Canada's largest oil sands producer, has been boasting that it reduced the greenhouse gas intensity of its operations by 51 per cent between 1990 and 2006.

Trouble is, during that time the company ramped up production to such a degree that their overall greenhouse gas emissions are up 131 per cent.

Suncor now plans to increase production from 260,000 barrels per day (bpd) to 550,000 bpd over the next five years.

NOW THAT'S... PROGRESS

- 1 Following an earthquake which caused a leak in Japan's biggest nuclear reactor, the country's nuclear watchdog has said it will inspect facilities less frequently to allow increases in 'efficiency'.
- 2 Britain's most revered academic library, the Bodleian in Oxford, is to build a £29 million book depository on a flood plain. The decision was 'postponed' in July, when swathes of the UK were under water.
- 3 Google is launching 'Google Sky' – a piece of software that will allow people who can no longer see the night sky because of light pollution to star-gaze.
- 4 The 'Little Matterhorn' mountain in Switzerland is to be topped with a 117-metre glass and steel conference centre. 'Our aim is to make the mountain more attractive,' said Zermatt tourism office.

communities worldwide.

But the United States, Canada, Australia and New Zealand were conspicuous in their refusal to sign the Declaration, arguing that it could undermine economic development and 'established democratic norms'.

'The entire wealth of the United States, Canada, and other so-called modern states is built on the poverty and human rights violations of their indigenous peoples,' said Arthur Manuel, a leader of Canada's indigenous communities. 'The international community needs to understand how hypocritical [these countries] are.'

The Declaration recognises the rights of indigenous people to maintain and strengthen their institutions, cultures and traditions, as well as have control over their land and resources.

REGULATION BUYER BEWARE

Europe is set to reduce safety checks on goods imported from China, despite a flurry of scares and fatalities this year.

A child died when he swallowed a magnet from a faulty toy, and other children's toys and jewellery have been found to exceed safety limits for lead.

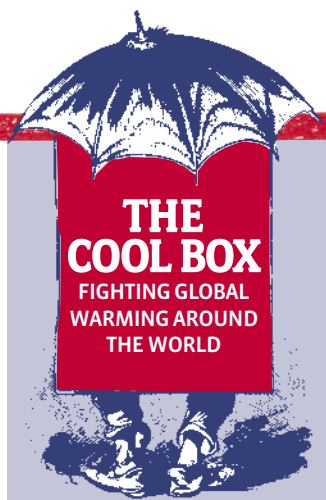
Toothpaste, cough medicines and pet food have all been found to be contaminated with lethal chemicals, and sub-standard tyres are among the list of dodgy goods identified.

However, European Union member states have voted to extend a light touch to industrial products and consumer goods.

FOOD A DROP OF MILK...

A diet that contains just a little dairy and meat products may be more environmentally-friendly than a strictly vegetarian diet, researchers at Cornell University have revealed.

Challenging accepted wisdom, the scientists published a study that compared 43 different diets in terms of their land footprint. Their results showed that although an all-vegetarian diet was extremely efficient in terms of land use (New York would be able to support a 50 per cent greater population from its surrounding agricultural land alone), a diet with some livestock products required even less area. This is because ruminant animals are able to graze on marginal land unsuitable for growing crops, allowing more of the countryside to be made productive.



CITY BLOCKERS

The Rainforest Action Network (RAN) has launched a campaign against CitiGroup and Bank of America, to end the banks' multi-billion dollar investments in the coal industry.

RAN has calculated that if the banks go ahead and bankroll the planned expansion of US coal-fired power stations it will create 1.1 billion tons of additional CO₂ emissions every year, equivalent to putting between 100–180 million new cars on the road.

For more information, visit www.DirtyMoney.org.

GREY POWER

US grandmother 85-year-old Liz Moore spent \$3,600 of her own money to launch a website detailing the destruction caused by oil sands operations in Canada, replete with photographs.

However, the site, www.oilsandsofcanada.com, has now been censored by Syncrude – the company operating the mine where Moore took her snaps.

'We see this as an issue of copyright, accuracy and quality,' a Syncrude spokesperson said.

Undaunted, Moore has now replaced the pictures with others supplied from environment groups.

Can't see the wood for the trees

Without much fanfare, and in defiance of public opinion, the US is approving the planting of GM trees. **Claire Robinson** assesses the potential impact



The US government has given the go-ahead for a test plot of genetically modified (GM) eucalyptus trees in Alabama. For the first time, these trees will be allowed to flower and set seed, opening the door to potential widespread contamination of the American South. Some of the trees are genetically engineered by biotech firm ArborGen for cold tolerance, others with 'confidential' traits. Published articles and industry reports indicate these traits may include the ability to kill insects and reduced lignin. Lignin gives trees strength and enables them to take up water.

The permit for the flowering GM eucalyptus was approved by APHIS (the Animal Plant Health Inspection Service, a sub-department of the US Department of Agriculture). The approval follows APHIS's grant of non-regulated status for the GM pox-resistant 'Honeysweet' plum, which the USDA itself helped develop. Non-regulated status is given on the basis that APHIS has decided that the plant does not present a risk of introduction or dissemination of a plant pest. Deregulation of the GM plum marked the first commercial release of a GM temperate tree in the US. It occurred in spite of the fact public comments against the proposal to deregulate the plum outnumbered those in favour by 100 to 1.

APHIS has also approved the largest-ever release in the US of GM poplars, some modified for reduced stature and light response, others for altered lignin content and others to result in a male-sterile plant.

The raft of approvals confirms the trend in the US regulatory system to approve applications for release without regard for the risks.

As far as eucalyptus is concerned, even to introduce it in its non-GM form could be foolhardy. Eucalyptus is a species of the tropics and subtropics, and is not native to the US. In countries where it has been introduced, it has become invasive. The fact some of ArborGen's GM eucalyptus trees are modified to be cold-tolerant will extend their ability to colonise. There is no way of knowing how this and the eucalyptus's other GM traits (which ArborGen will not reveal) may impact forests and wildlife.

Another problem ignored by APHIS is the risk to people and animals. The Global Justice Ecology

Project has uncovered evidence that one eucalyptus species engineered into the GM version is host to a deadly pathogenic fungus, *Cryptococcus gattii*, which causes fatal fungal meningitis in people and animals that inhale its spores. Cases are increasing worldwide, possibly coinciding with the spread of introduced eucalyptus. Two recent studies show that the fungal human pathogen is common in eucalyptus and that it is endemic in the Northwest US and British Columbia, Canada. APHIS ignored the fact eucalyptus poses a threat. It has dismissed the warnings of scientists such as Dr Joseph Heitman, director of the Center for Microbial

'The trend in the US is to approve the release of GM trees without regard for risks'

Pathogenesis at Duke University Medical Center, North Carolina, and an expert on *Cryptococcus*, who said, 'Introducing large numbers of eucalyptus trees in the US has the potential to provide a suitable habitat for *Cryptococcus gattii*.'

A major reason regulators bow to pressure to commercialise GM trees is that they are claimed to offset carbon emissions and thus qualify for subsidies under the Kyoto Protocol's Clean Development Mechanism. Rising demand for biofuels has also allowed proponents to rescue GM crops from chronic market failure by promoting them as energy crops. Unfortunately, energy crops, including GM trees, are far from sustainable. The UN is one of several bodies pointing out that the rush to energy crops threatens increased poverty and food shortages.

Earlier this year a UN report said biofuels were not guaranteed to reduce greenhouse gas emissions. Biofuels result in some reductions compared to petroleum fuels, it says, but this is provided there is no clearing of forest or peat that store centuries of carbon. In reality, deforestation is already speeding up in Brazil, Malaysia and Indonesia to make way for palm oil and other plantations to feed the new biodiesel market.

The traits engineered into GM trees bring their own environmental problems. Sterility

technology, as used in GM poplars, is designed to make trees male-sterile by making the pollen non-viable. It is promoted as preventing GM contamination of other plants, but is a 'leaky' technology that produces some viable pollen. Thus the male sterility trait could spread to non-GM trees, leading to sterile forests.

Bt trees, in which a pesticide is engineered into every cell, are toxic to insects. Evidence is growing that Bt crops are also toxic to non-target organisms, such as animals that graze on them or feed on insects that have ingested the Bt. Bt crops infect soil, too. Trees have life-cycles of 100 years or more, so Bt plantations will be sources of toxicity for years to come.

Low-lignin trees are of particular value to the biofuels industry. Anne Petermann co-director of the Global Justice Ecology Project, says, 'Cellulose is the material of interest in the manufacture of cellulosic ethanol, and lignin gets in the way, so engineering trees for reduced lignin and more cellulose is of great interest. It's unlikely that industry would pursue trees for cellulosic ethanol without them being genetically engineered.'

The problem with low-lignin trees is that half their strength has been removed, making them vulnerable to environmental stresses such as pests and high winds. The tendency of GM traits to leak into ecosystems raises the prospect of disastrously weakened forests unable to cope with increasingly extreme weather. Once fallen, such trees decompose more rapidly, returning carbon dioxide to the atmosphere at an accelerated rate.

In spite of the hype surrounding the use of wood for biofuels, the technology does not yet exist to do it efficiently. It probably cannot be done without using GM enzymes. For this reason, the US Department of Energy's Joint Genome Institute is involved in a project to genetically engineer the enzyme from the gut of a termite to aid the cellulose-digestion process. As Anne Petermann says, 'Imagine the impact on forests if that got loose.' When it comes to GM trees, it seems our regulators would prefer not to imagine, or even to exercise common sense. **E**

Claire Robinson is an editor at GM Watch



SILENT BUT DEADLY

Did you know that farmed animals produce more greenhouse gas emissions (18%) than the world's entire transport system (13.5%)? Or that nitrous oxide from animal manure is around 300 times as damaging to the climate as carbon dioxide? Or that methane (cow and sheep farts/burps to you and me) has 23 times the global warming impact of carbon dioxide?

Makes you think doesn't it?

The only genuine way to cut down on these harmful emissions is to stop eating meat.

Find out the facts about 'Why it's green to go vegetarian' at www.vegsoc.org/environment, or order your free booklet on 0161 925 2000, green@vegsoc.org

It's not just a lot of hot air.

Red hot for green funds.

With the need for solutions to environmental and social issues high on the agenda, companies that are focused on tackling them are likely to do well. Jupiter's range of green and socially responsible investment funds focuses primarily on these types of companies, applying red hot investment skills to a socially responsible mandate.

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rigorously and ethically screened, only those that meet both financial and socially responsible criteria are considered. The result is two green funds that aim to outperform: the **Jupiter Environmental Income Fund**, with a UK remit, and the global **Jupiter Ecology Fund**. Because to us, green investing is about sustaining your future as well as the planet's. To find out more speak to your IFA, call 0500 0500 98 or visit jupiteronline.co.uk.

The value of investments can fall as well as rise and may be affected by exchange rate variations.



On the planet to perform

The past several years have witnessed a rush to the courthouse by lawyers around the world seeking to tackle climate change. Nowhere is this climate change-chasing more prevalent than in the US, where a diversity of cases has been filed. Ranging from a lawsuit against oil and chemical companies for damages from a global warming-intensified Hurricane Katrina, to a challenge against the government for its failure to assess the impacts of global warming on polar bears and the Pacific walrus, the legal onslaught seeks to bring an intransigent US president and overly cautious Congress into the international mainstream of addressing our collective environmental future.

As these cases proliferate, their success in mitigating the causes of global warming and remunerating the injured will owe a great deal to an aggressive and unique eight-year legal effort that culminated in an historic ruling by the US Supreme Court.

The path to an emerging and seismic shift in US climate policy began quietly in the waning days of the Clinton Administration. As the 1990s wound to a close, the US was at a standstill in addressing global warming. In the case of emissions from automobiles, a contributor of more than 25 per cent of all US greenhouse gas emissions (GHGs), the political and bureaucratic gridlock was palpable. The prospect of raising automobile fuel efficiency was politically dead in the Congress and the Environmental Protection Agency (EPA) willfully avoided the issue when setting new car tailpipe pollution standards.

It was at this nadir that the International Center for Technology Assessment (ICTA), an US NGO, embarked on a unique legal strategy that would eventually break the logjam. Using the science behind the Second Assessment report of the 1995 Intergovernmental Panel on Climate Change (IPCC), the ICTA filed an administrative legal petition – essentially a legal request – demanding that the EPA regulate the release of carbon dioxide and other GHGs because, under the US Clean Air Act, they were ‘air pollutants’ that were ‘reasonably anticipated to harm public health and welfare.’

Embraced by only a few other environmental organisations, the legal petition was viewed by many as a long shot. When such actions are filed they often get stuck at the bottom of the bureaucratic priority list and gather dust.

Given the politically sensitive nature of the ICTA petition and the Bush Administration’s avoidance of all things climate, it is not surprising then that the petition languished in the halls of the EPA. For the petition to have any meaningful impact, the ICTA knew all along the issue would have to be forced.

In 2002, over the objections of some in the environmental movement who feared political blowback from pushing the petition’s agenda, the ICTA, joined by the Sierra Club and Greenpeace, filed a lawsuit that compelled the Bush Administration to respond to the petition. As the groups expected, the ultimate agency response was to reject the petition’s demands to regulate GHG emissions from



LAW

The path to climate change

It took a unique legal long shot to bring about a *volte face* in George Bush’s climate change policy.
Joseph Mendelson reports

cars. In answering the petition, the EPA cited an array of disjointed legal and policy reasons including the need to maintain President Bush’s ability to negotiate international agreements and the uncertainty of the science that surrounds climate change.

The petition’s denial was the galvanising moment that ICTA and others had long anticipated. In denying the petition, the EPA had opened itself up to a formal legal challenge. A diverse number of groups joined together to make that challenge.

With the state of Massachusetts taking the lead, joined by 10 other state governments, three cities, and 12 other environmental groups, ICTA again marched into federal court, now attacking the legal bases of the EPA’s petition denial. What had been an administrative law dispute with the EPA transformed into a legal showdown with the Bush Administration over its refusal to tackle global warming.

The initial legal battle yielded an unsettling result. A panel of three judges issued a split decision, with one judge holding that the EPA acted illegally in denying the petition and two others deciding (for different reasons) against the environmentalist legal position. Determined to press forward, the coalition appealed its loss in the lower court and sought review by the US Supreme Court. While such a review is rarely granted (approximately 1 in 100 cases), the court agreed to hear the case prompting *The New York Times* to call it ‘among the most important environmental disputes ever to come before the court.’

On November 29, 2006, before a standing room-only crowd, the court heard oral argument and the justices bantered back and forth about, among other things, whether global warming happens in the troposphere or stratosphere. And then everyone waited until April 2, 2007, when the court finally released its opinion. The decision sent shock waves through Washington and permanently altered the US political debate on global warming. Writing for the majority, Justice Stevens’ opinion begins in striking fashion, repeating the petitioners’ view that global warming is ‘the most pressing environmental challenge of our time’ and emphasising that ‘the unusual importance of the underlying issue [i.e. climate change]’ triggered the court’s review. The initial prose foreshadowed the end result – a stunning 5-4 decision finding that the EPA had illegally denied the ICTA legal petition.

Maybe of most significance in the decision was the court’s initial finding that the petitioners had ‘standing’ to bring the case. The court found that Massachusetts was injured in its capacity as a landowner because of climate change-induced sea level rise (and the subsequent loss of state property). The court added that US motor vehicle GHG emissions, amounting to about 6 per cent of total world GHG emissions, were significant enough to be considered a cause of global warming and the sea level rise, and if the EPA implemented regulations to curb these emissions, as requested by ICTA, global warming would be slowed and the petitioners’ injuries redressed.

In so finding, the court indirectly became a final arbiter on the science, weighing in favour of finding that the impacts caused by climate change were real and reasonably foreseeable.

And in recognising that harm from climate change is an injury allowing parties to seek relief from the court system, the justices kicked the courtroom's door wide open for future litigation.

The court's second crucial determination was that carbon dioxide and other GHG emissions were 'air pollutants' under the Clean Air Act. The legal result of this conclusion has broad impacts on US policy options to reduce domestic GHG emissions. Once the EPA makes a finding that the emissions of these 'air pollutants' endangers public health and welfare – a foregone conclusion given the court's ruling and the recent IPCC Fourth Assessment – US law will trigger the first mandatory regulatory reductions of emissions from mobile sources (cars) and stationary sources (power plants). These sectors comprise nearly two-thirds of all US emissions.

The political fallout has arguably been even greater. What the final EPA regulations will look like is anybody's guess. Nonetheless, the decision supports the ability of California and 11 other states to continue on their own to adopt strict new regulations designed to reduce carbon dioxide emissions from cars. And the Congress may not allow the EPA to act on its own. The court's decision prompted Senator Barbara Boxer to exclaim that the decision 'puts the wind at our back' in pursuit of new global warming restrictions and has rejuvenated movement toward a legislative solution focusing on a cap and trade program.

While the end result may not be clear and the resolution several years away, the landscape has changed so significantly that through either an NGO litigation assault, a reformed EPA or an empowered legislature, the next five years will witness a monumental about-face in the legal and political direction of US climate change policy. The Bush Administration's reliance and praise for voluntary steps to curb global warming is rapidly crumbling under the weight of the Supreme Court's decision. Indeed, ICTA's legal long shot beat the odds and appears to have paid off handsomely for the planet. **E**

Joseph Mendelson is the legal director for the International Center for Technology Assessment (CTA) and the Center for Food Safety. He served as co-counsel in *Massachusetts v EPA* and devised the lawsuit with his legal partner Andrew Kimbrell. For more information see www.icta.org.

MAKING DO

Everything they want

I am often accused by my family of being fairly grumpy. I don't agree: I think of myself as a patient and charming man, but there you go. On a long family walk last Sunday, my wife suggested the 'making-do rubbish' I was attempting was causing more stress in the family than it was worth.

'Why don't you just buy yourself something and stop moaning,' was the quote I remember. I tried to explain that I'd got this far – nine months without buying anything new for myself – so it would be utterly self-defeating to give up now.

On reflection, I understand her unhappiness. My stance this year has made my family face the fact that, in terms of material possessions, they get pretty much what they want, when they want it. We have tried hard not to spoil our children and they don't have a lot of the things children their age seem to take for granted. They don't have TVs in their rooms and... Um... Oh dear. I was about to try and create a long list of things they don't have. TVs in their rooms – that's about it.

Computers, yes. Bikes, yes. Mobile phones, yes. Skateboards, iPods, Nintendo DS, yes, yes, yes. Okay, so they do have anything they want, we have utterly spoiled them and my attempt to show them that buying new things doesn't necessarily make you happy is utterly futile.

Well, I'm not so sure. They do now understand that sometimes you have to wait for things.

It was my daughter's 11th birthday last week and she was given some money from family, friends and relatives. I went with her to the livery shop where she bought a grooming kit for her pony. Yes, that's right, she does have a pony, on top of everything



else. Anyway, over many weeks she had studied the various accoutrements for turning her scruffy old pony into an equestrian catwalk model and had been looking forward to getting them. She knew to wait and not complain; she has learned

delayed gratification, the notion that you can't just have everything you want as soon as you want it, and if you don't have the money you just borrow it. So that's good.

But the family has to put up with me peering at them over my glasses in classic patronising pose when they demand new skateboard shoes, new jodhpurs, new iPods and a new dress for that party next weekend. I say nothing. Well, I should say nothing. In fact, I can't quite stop myself from saying, 'Well I haven't bought anything new for myself for a year and I'm okay.'

This doesn't meet with my dreamed-of response of, 'You are right, Father: we will wait until next year and then will appreciate what we receive and be thankful for it, knowing that, in all probability, much suffering has taken place in order for this abundance to be at our disposal.'

As you may be able to imagine, I don't get that. In fact, I get nothing. They ignore me and go and buy the stuff with their mother.

Having lived through the political turmoil of the early 1970s, the three-day week, the endless shortages and high unemployment, I am always expecting massive financial

collapse to be just around the corner, even though the world has

seen a period of absurd economic well-being over the last 10 years.

Maybe I just want to prepare my children for the possibility that it might not always be so easy. **E**

The family has to put up with me peering at them over my glasses when they demand new shoes, new jodhpurs, new iPods...

Robert Llewellyn is an author, actor and television presenter.



AGRICULTURE

Ploughed into despair

Out of the red and into the black, farmers across the world are paying the highest price for their debts. **Raj Patel** reports on subhuman conditions on the Indian subcontinent

As the bluetongue virus sinks its teeth into British livestock, there is one appalling certainty: like the outbreaks of Mad Cow Disease and foot-and-mouth before it, some farmers will see no way out, and take their own lives. Farmers in Britain are the profession second most likely to commit suicide (after, bizarrely, dentistry).

Before the 2001 outbreak of foot-and-mouth disease, British farming, especially livestock farming, was in a parlous state. Bovine spongiform encephalopathy (BSE) and swine fever had already taken their toll on the industry. The prices of agricultural products, especially meat and dairy, had dropped markedly. Incomes were therefore very low, and many farmers also had large debts. Bureaucratic procedures, especially the requirement to complete numerous official forms, added to the stress.

Given all this it is hardly surprising that studies show that British farmers are more than twice as likely as the general population to contemplate suicide. But the higher rates of depression and suicide among British farmers are not unique and, indeed, mirror that of farmers everywhere. As climate change and disease press harder on the world's farmers, the problem is likely to get worse.

Across the planet, the world's poorest people are struggling to keep their heads above water. Farmers who are lucky enough to have access land find themselves caught between rising costs of inputs and a crop price that, in the main, has been downward. Prompted by the

need to squeeze more out of their land, farmers do as they always have – they innovate.

In a field outside Bangalore, this is what one farmer in Tamil Nadu, India – let's call him Kistaiah Masaya – did. To innovate, he needed money. The only place he could get some was from the local money lender (and at exorbitant rates). He borrowed the money certain that he would be able to repay. He used the cash to hire a drill to bore a well, so that he could irrigate his crops. The well was dry. So he borrowed more and sunk another well. And another. And another. All were dry.

One night, late in August, when the rains had failed to come, Kistaiah reached for a packet of phorate, a pesticide used in developing countries, despite its being listed as unsafe by the Food and Agriculture Organisation. He mixed a little with water and drank it.

The poison ran through his skin before it went through his stomach, paralysing his nervous system, choking his lungs and stopping his heart. Kistaiah can't have convulsed very hard: he died without waking his wife and two sons.

Kistaiah's death is one among many – indeed, it is hard to open a newspaper in India and not find some reference to a farmer suicide. Full figures are hard to come by – no national database is kept – but summing over

a series of studies, it's safe to put the death toll at tens of thousands every year.

It has been suggested that the high risk of suicide among farmers may be related to the access they have to means of committing suicide – pesticides and firearms, for example – but it is the whys of farmer suicides that is arguably more important than the hows.

Invariably, these suicides correlate with high levels of debt. S. S. Gill, an academic at the Punjabi Agricultural University, has studied the issue. 'Show me a farmer with 150,000 rupees (about £1,800) in debt,' he says. 'I will say to you he is sure to commit suicide in the future.'

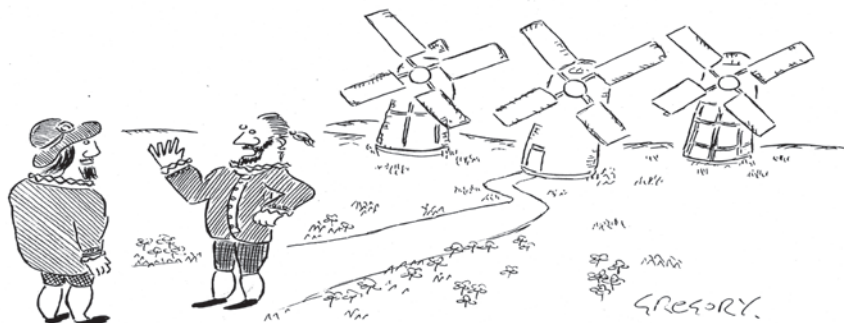
The precise reason farmers topple into despair varies, from crop failure to injury or wedding costs, but the outcome is invariably bleak with high debt.

Pesticide companies have been quick to capitalise on this despair. Many now trumpet their products as a way out of poverty – in particular with genetically modified crops such as cotton. Far more expensive than their conventional counterparts, in some areas GM cotton seeds have done so badly that in one Indian state, according to the Associated Press, a federal regulator denied permission for Monsanto to sell three different varieties of GM cotton. The government was pressed into action precisely because of the high suicide rates of indebted GM cotton farmers.

Of course, suicide isn't the only recourse for farmers. Those in Shingnapur, a village in the Amravati district of Maharashtra, have opened up a kidney sale centre, which they invited their local politicians to patronise, in order to help repay their loans.

And this points to a key contradiction: as India's most important rural commentator, P. Sainath, has observed, we are troubled by how people die, but not by how they live – and the majority of India's rural poor are doing

“Suicide isn't the only recourse for Indian farmers. Those in Shingnapur have opened up a kidney sale centre to repay their loans”



"THE TROUBLE IS, THOSE THINGS ARE JUST SUCH AN EYESORE."

very badly indeed. Those doing worst are not farmers, but farm labourers, among whom malnutrition has gone up to levels unseen since British rule. Unlike farmers who die by their own hand, many more farm labourers die from hunger. All this happens at the same time as another epidemic: because of spiking levels of processed food snacking, India will soon be home to the world's largest concentration of diabetics.

The unravelling of the Indian government's commitment to its poorest citizens began in earnest in 1990, when Manmohan Singh, the current Indian prime minister, was finance minister. He introduced a suite of economic policies that led to a fall in government spending on agriculture and let into the country agro-food companies such as Coca-Cola and Monsanto, together with their advertising dollars and their genetically modified seed. The net result has been a steep increase in landless households, from around 35 per cent in 1987–88 to more than 40 per cent in 1999–2000. The net effect of this policy has been to drive the poor out of agriculture.

It is an economic policy that will soon be blessed by the World Bank and foisted on more impoverished farmers, not just in Asia, but worldwide. In its forthcoming *World Development Report on Agriculture*, the World Bank gives the green light to the shifting of poor agricultural workers to 'more efficient' sectors. Of course, an increased pool of unskilled rural labour does nothing so much as drive down wage rates. The countries that have implemented the Bank's suggestions most vigorously have also seen steep rises in urban poverty rates; yet the Bank's remedy to rural despair is to sigh and tell poor farmers that they're not destined to be on the land, and usher them on to menial work off the farm.

This rural crisis is one that is being vigorously challenged by farmer groups such as Via Campesina. The odds are steep, especially given the bank's international power, but we can only hope they succeed in stopping these kinds of economic savagery. And not just for the sake of farmers in India, but for farmers worldwide. Even British ones. **E**

Raj Patel worked for the World Bank, interned at the WTO, consulted for the UN and has been involved in international campaigns against his former employers. His latest book, *Stuffed and Starved* (Portobello, £12.99), details the failures of the global food system.

MAD SCIENTIST

Dark energy



In Greek mythology, heroic Prometheus liberates humans from ignorance and suffering by stealing from the gods sacred fire, with which humans are then able to build a civilisation. Our own civilisation, however, is now running out of sacred fire. 'Peak oil' has now happened and by 2040 we will be on the edge of an energy catastrophe.

As Jared Diamond details in *Collapse: Why Societies Choose to Succeed or Fail*, societies fail when their energy supply collapses. Today, as the reality of peak oil hits home – 30 years before we're running on empty – with its fatal implications for global climate stability, the 'permanent government', those high-ranking officials whose whole lives are spent in public service, are waking up to the crisis. From Whitehall to the Washington Beltway, a desperate search is on.

Experts explain that from the twin evils of environmental climate disaster and energy supply collapse there is no apparent way out unless we can find this almost mythical Grail, an alternative source of energy to run our civilisation and not turn our atmosphere into a toxic gas-chamber.

For two years now, discrete meetings have gone on, with top-level officials demanding answers of scientists. Nuclear power, once championed as offering limitless energy, now has its own crisis. It too relies on fossil fuel and remaining stocks of high-grade uranium ore have also peaked.

There remains an unwillingness to consider the limitless power of renewable energy, primarily because the powers that be refuse to acknowledge the failure of the global economy and its requirement for mobility and

insatiable appetite for fuel.

So scientists and officials are now considering ideas once deemed pure science fiction. From the inner laboratories of NASA to the dark heartlands of America's classified weapons establishment, extraordinary

things are happening, with echoes of the mobilisation of scientists that occurred on the Manhattan Project in 1942. In the secret places where dark science and conspiracy theory meet, a small but perfect storm of revolutionary physics is brewing.

The ideas go back to 1929 and German physicist Max Planck, father of quantum physics; a darker part to the dying days of a collapsing Third Reich, when Hitler's Nazi scientists were searching for super-weapons to save Germany from defeat. It is called zero-point energy; astrophysicists call it 'dark energy', or 'vacuum energy'.

'Dark energy' refers to an omnipresent and theoretically tappable field of energy in the electromagnetic quantum field. With the potential of almost-free, virtually-unlimited non-polluting energy, the search is on to find ways of collecting and using it.

Our world is bathed in this energy sea, invisible, unnoticed, but enormously powerful. The volume of a coffee-cup contains enough zero-point energy to evaporate all the world's oceans. With infinite potential, no radioactivity and no waste products, it might be civilisation's Promethean solution.

In the secret places where dark science and conspiracy theory meet, a small but perfect storm of revolutionary physics is brewing

Might be. In the meantime, projects such as nuclear fusion attract funding of €10 billion, almost half the total global spending on tried-and-tested renewable technologies in 2004.

Let's not keep hanging on for the *deus ex machina*. This time around, the gods might be just too slow. **E**

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BEHIND THE LABEL: Tampons

From synthetic fibres to lethal dioxins, some sanitary products are a lot less innocent than those glossy television ads would have women believe. **Pat Thomas** reports

Increased absorbency. Odour neutralising. Improved leak protection. Women's reproductive lives have always been seen as a series of problems to be solved, and the world of tampon marketing is no exception. Indeed, when I was a girl tampons were advertised to women as allowing them to ride horses and swim during their periods – and no-one will ever know it's 'that time of the month'.

In the EU alone, women spend more than \$5 billion a year buying around 45 billion sanitary napkins, tampons and panty liners (glamorously known in the trade as 'san pro' products) each year. In the US the figure is around \$3 billion.

Sanitary products – and tampons in particular – are also the subject of endless urban myths. The most persistent among these is the idea that manufacturers put chemicals in them to produce heavier bleeding. It seems unlikely and, in any case, because the 'ingredients' in tampons (including the basic fibres they are made from) are rarely, if ever, listed on the box and few manufacturers volunteer this information, we may never know.

What is true is that even in this specialised part of the global marketplace, the words 'new' and 'improved' are used to drive sales. And while it may seem that there is a limit to what can be done to radically revamp a fibre plug that you insert into your vagina, never underestimate the desperation of product manufacturers.

Tampax, for example, owned by Procter & Gamble and the global brand leader with

around 30 per cent of all sales, has recently introduced a new shape of tampon with a 'skirt' – a fibre frill at one end – which it says prevents leaks. There are odour-absorbing tampons, perfumed tampons, 'digital' tampons (non-applicator types that you insert with a finger) and applicator types that use sheaths of cardboard, plastic or plastic-coated cardboard to make insertion easier. Manufacturers are also continually experimenting with new fibres or materials for increased comfort and performance.

This is nothing new. As Pulitzer Prize-winning author Laurie Garrett noted in her book *The Coming Plague* (Penguin, 1995), over the years manufacturers have mixed a variety of fibres with cotton to improve absorbency and maintain the tampon's shape inside the body. These include polyester, collagen, acetyl cellulose, carboxymethyl cellulose, polyvinyl alcohol, polyurethane – and even asbestos.

It was this race to perfect the super-absorbent tampon that eventually led to the link between tampon use and Toxic Shock Syndrome (TSS), since super-absorbent tampons provided an ideal breeding ground for the *Staphylococcus aureus* bacterium that causes TSS.

TSS is a severe, potentially fatal infection of the blood caused by a toxin called TSST-1, which is produced by the otherwise benign

Staphylococcus aureus bacterium. This bacterium is naturally present in the warm moist parts of the human body, including the vagina, and most of the time causes no harm. But sometimes the *S. aureus* gets converted into the TSST-1 toxin. The vast majority of TSS cases are linked to tampon use, especially in women under 25.

Super-absorbent tampons don't just provide a useful petri dish for this conversion. They also dry out the vagina, leading to lacerations, lesion and ulcerations when they are removed. They also leave small fibres behind that can irritate the delicate mucous membrane inside the vagina. These ulcerations and irritations provide entry points for opportunistic bacteria. The Women's Environmental Network (www.wen.org.uk) has gathered data showing that up to three-quarters of all tampon users have some alteration to the mucous membrane of the vagina.

Symptoms of TSS include fever, rash, nausea, vomiting and hypotension during or a few days after the menstrual cycle. Rarely, it can lead to death. With tampon fibre retention, a woman may experience intermittent bleeding, headaches, fever, abdominal pain and purulent vaginal discharge, but not until a week or more after her period.

Critics of tampons also point out that most are made from cotton and rayon that is bleached white. Rayon, a synthetic fibre derived from cellulose, is also potentially

dangerous because the process of extracting cellulose from wood pulp involves the use of chlorinated compounds and creates the hydrocarbon dioxin as a by-product, minute remnants of which remain in the fibre. Potentially carcinogenic, dioxin is believed to cause endometriosis. It has also been shown to cause problems with the immune and reproductive systems.

Tampon marketers are quick to note that the amount of dioxin in their products is next to nothing. A Food and Drug Administration study in the US, for instance, concluded that the dioxin level in a typical tampon is about one part in 3 trillion, a level comparable to a teaspoon in a large lake. This may be so but it is also misleading, since a teaspoon of dioxin is enough to kill thousands of people, and women, of course, use many tampons over a lifetime. Dioxins are persistent and once in the body they remain there indefinitely, building up with each new exposure.

Some of the smaller suppliers have begun offering tampons that do not contain rayon (which, being naturally brown, requires more bleach than cotton) or tampons that are unbleached. Equally, some manufacturers are switching bleaching processes away from the chlorine process that potentially leaves dioxin residues on the fibres.

Some tampons contain preservatives such as parabens, which are oestrogenic and are implicated in higher rates of oestrogen-

dependent cancers, for instance of the breast and ovary. Others contain perfume or are in applicators that are perfumed. The ingredients of perfume are neurotoxins and have no place anywhere near the vagina, where they are easily absorbed. Any chemical that comes into contact with the delicate skin of the vulva can cause irritation and itching. If you suffer from persistent vulval itching it could simply be your choice of sanitary products.

It's not just the tampon itself that is the subject of innovation, however. Packaging is constantly being updated. Thus, not long ago Tampax introduced a compact tampon packaged in such brightly coloured, scented plastic wrapping that – according to its TV advertising – your dolt of a boyfriend will think it is a sweetie. In the US, retailers are focusing on making the feminine hygiene aisle of the supermarket more intimate, so that women will feel 'comfortable' spending longer there making their purchasing decisions.

Apart from the health issues, there are also environmental concerns associated with tampons. Tampons can easily be inserted with a finger, yet nevertheless many come with applicators made from a variety of materials, including plastic. Simply by using a non-applicator tampon you can be doing your bit to reduce waste. A woman who uses tampons is estimated to go through nearly 10,000 in her lifetime. The thousands of applicators disposed of every day contribute to over-clogged

landfills and blockage problems at some municipal sewage treatment plants. Plastic applicators can take six months or more to biodegrade.

Finally, even if you do use an all-cotton tampon, it is as well to be aware of the increasing proliferation of GM cotton in the marketplace. Dr Ilya Sandra Perlingieri, author of *The Uterine Crisis* (1st Books, 2003), believes that more and more tampon manufacturers are using genetically modified cotton, which resists the effects of antibiotics. This is important since the rate of sexually transmitted diseases is on the rise. Bacteria exposed to GM cotton may inherit that resistance to antibiotics, making STDs increasingly difficult to treat. As with food, so with tampons; the best way to avoid this problem is to source tampons made from organic cotton. **E**

Try this at home

If you want to know if your brand of tampon leaves fibres behind, try this. Take a glass of warm water and put a tampon in it. Keep the tampon in the glass for the same amount of time you would normally leave a tampon inside of your vagina. After you remove it from the glass you'll be able to see the fibre loss from your tampon.

Better alternatives

Most tampon manufacturers offer their products in a range of absorbencies. Women should always use the lowest absorbency they can and change tampons frequently. It is also a good idea to consider other types of protection, especially at night, such as pads.

Generally speaking, the vagina is a self-cleaning organ. Its basic physiology plus gravity mean that bodily secretions and blood are meant to flow down and out. Depending on a variety of factors, such as your general level of health and hygiene, anything that you put in your vagina for a long time will raise the risk of infection. Thus, if you are worried about any potential health effect of using tampons, pads should be your first-line alternative.

Disposable pads do have

environmental implications, however. Often they have plastic backing and are laced with perfumes and odour neutralisers, and may even have a rayon content. Disposing of conventional pads adds to the accumulation of waste, so when choosing look for those that are organic (thus GM-free) and made to be quickly biodegradable. Natracare provides a full range of organic feminine hygiene products including tampons and pads (www.natracare.com).

Reusable pads

Preferably made from organic and unbleached cotton, these are highly absorbent and can be washed with your usual clothes instead of being thrown away. Look for brands like Drapers (www.drapersorganiccotton.co.uk) and Wemoo (www.treehuggermums.co.uk).

Cervical cups

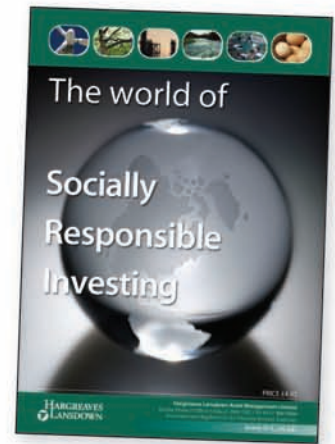
Menstrual cups are small latex or silicone cups that fit, via suction, on to the cervix. The cup can store menstrual fluid for up to 12 hours, though like a tampon it is wise to take it out after a few hours out and rinse it thoroughly before reinserting. Unlike traditional disposable feminine hygiene products, menstrual cups have a life-expectancy of 10 years. See www.mooncup.co.uk and www.thekeeperstore.com

Sponges

These relatively new products work like tampons but are made from sea sponge. There are environmental implications to farming sea sponges and, like tampons, because they are left in the vagina the risk of bacterial growth is likely to be higher. See www.seapearls.com.

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Earth angels

Hold a stone in your hand and you are holding a piece of the planet's history. The work of sculptor **Emily Young** celebrates the natural forces that shaped life on Earth

The loveliness, power and strength in stone is the raw beauty of Nature herself. In every piece of stone there is a story told more magnificent than any creation myth; a story that shocked and astonished the Christian geologists of late-1700s England when they first started to decipher, through the fossil record, the history of life on Earth. Through learning to read the tracks and traces of the cataclysmic and remorseless geological changes that formed the planet, a story was uncovered

Above: Wounded Angel, in London's Kew Gardens, is part of Emily Young's Earth Angel project



Above: the head of a warrior, 70cm high, carved from quartzite mined in Dundonnell

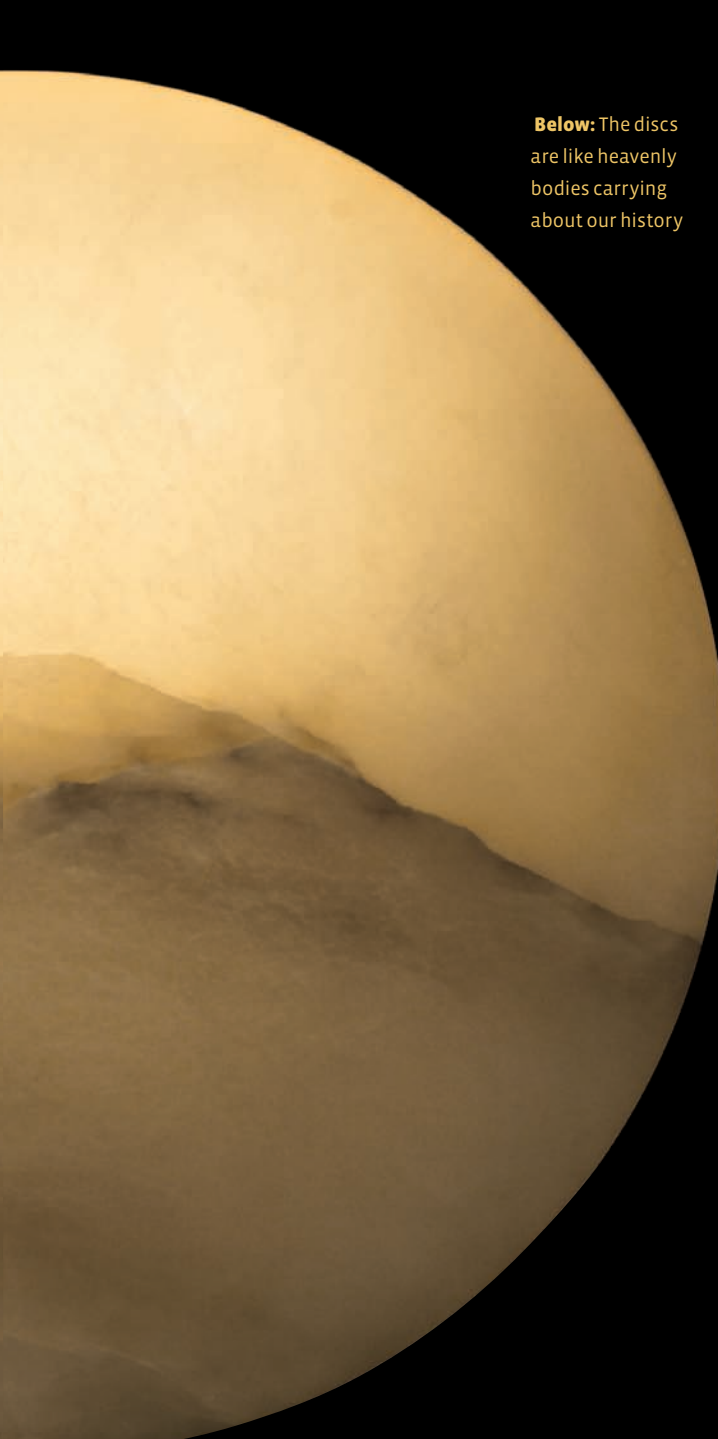
that led directly to the computing of the true age of the Earth, the solar system, our galaxy and the universe. The science we depend upon for our everyday lives is tied inextricably to that ability to read the fossil record, the stone and the land.

Stones – so slow, silent and long-lived – are made, like us, of particles that were born in starbursts, in galactic winds, in our first Big Bang. There's a poetry in them. They whisper to us about things older than we can conceive, gloriously mysterious yet hard and real. We can touch them with our hands, look into them with a microscope, and they reveal their stories, encouraging us to consider the brevity of our incarnation here on Earth.


And now, in this millennium, I make my mark on them, creating familiar forms, carrying an emotional charge. The heads I carve have the demeanor of

wildness, gravity and beneficence. The discs are like heavenly bodies, stars, whirling in dark space, carrying information about our origins and throwing out light to us. So I call these works – both the heads and the discs – 'angels', consciously using the Sanskrit origin of the word angel, 'Anjiras', which means 'messenger'. It's the best word to describe their function, as kinds of fellow beings, ancient ancestors, speaking to us from aeons ago, truly messengers from the past. They become Earth Angels when they arrive in our midst, and we claim them as our own.

Because of the durability of the material, it is possible to imagine some of these works lasting far into the future. They could plausibly be seen again millions of years from now by... whom? These old stones, carved now, telling stories about both us and the history of



Below: The discs are like heavenly bodies carrying about our history



Left: Young points up the link between stones and humans in this quartzite statue of a girl

Earth, will outlive us and remain long after we have left this place. And in case technology doesn't sort our problems and mankind doesn't make it through to a safe future, as the scientists tell us is possible, these stone carvings will join with other remnants of the past and lie waiting through the millennia to be read again in some unknowable futurescape, a memorial to us. **E**

Emily Young's ongoing Earth Angel Project consists of placing 12 large - at least three tons - partially carved stone heads or discs around the world, on each continent. Three are already installed, in Paris, London and Italy, and plans are under way for further installations in China, the US, Australia, India and Brazil. See www.emilyyoung.com.



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Watch out, says **Jeffrey Smith**. GM food is still very much on the menu – unless we all fight to keep it off

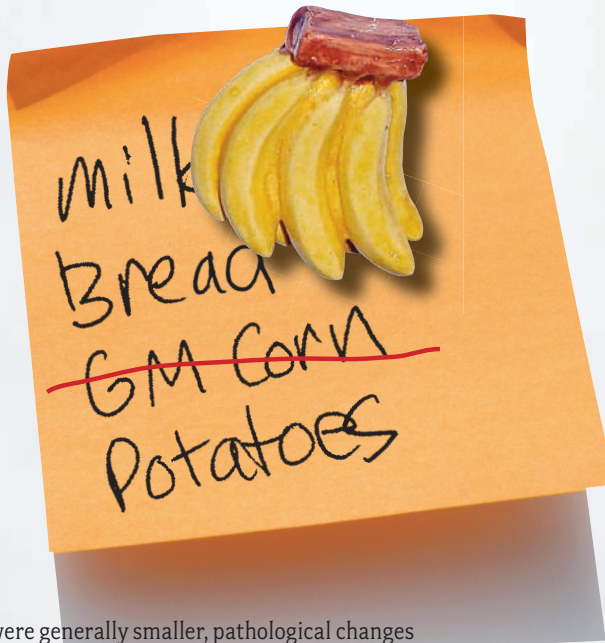
It was a bad year for the biotech barons. At a conference in January 1999, the consulting firm Arthur Andersen revealed Monsanto executives' vision of an ideal future – a world in which natural seeds were virtually all extinct and where commercial seeds were genetically modified (GM) and patented. Andersen Consulting then worked backwards from that goal, developing the strategy and tactics to help Monsanto achieve industry dominance in a GM world. At the same meeting another biotech company, apparently with the same aspiration, showed a graph that projected a 95 per cent replacement of all natural seeds by GM varieties in just five years. Within weeks, their ideal future crashed.

By mid-February, Parliament had invited scientist Árpád Pusztai to tell what he knew. Just a few years earlier, in 1996, Pusztai had been given a grant of £1.6 million by the UK Government to design a rigorous safety assessment protocol for testing GM foods. In the course of his studies under the auspices of the Rowett Institute in Aberdeen, Pusztai, a pro-GM scientist with a stellar reputation, discovered that the GM potato he was working on caused massive systemic health problems in rats. Virtually every organ in the animals' bodies was affected by eating the GM potato – their brains, livers and testicles

were generally smaller, pathological changes in the thymus and spleen were detected and the animals' immune systems were damaged.

Since most GM foods were created using the same process and genetic material, the results raised serious questions about the safety of all GM foods. Pusztai went public in 1998 and paid dearly for his integrity: he lost his job of 35 years, was silenced with threats of lawsuits, his 20-member team was disbanded and the project terminated.

In the same year, the US Food and Drug Administration (FDA) records – 44,000 pages of them, kept secret since 1992 – revealed that references made by US government scientists to 'unintended negatives effects... were progressively deleted from drafts of the policy statements (over the protests of Agency scientists)' and that the FDA was under orders from the White House to promote GM crops.



GM food campaign

Concern about the safety of GM food was growing. Pusztai's parliamentary invitation forced the Rowett Institute to lift its long-standing gag order. When the scientist finally spoke out about the GM potatoes that had caused such substantial damage to rats, and how the biotech industry had scrambled to protect its reputation by rubbishing his, the press went wild. By week's end they had spewed out 159 'column feet' of text, which, according to one columnist, 'divided society into two warring blocs.' An editorial stated, 'Within a single week the spectre of a food scare has become a full-scale war.'

The resulting overwhelming consumer resistance was too much for the food industry. GM food became a liability and, in April 1999, Unilever publicly committed to removing GM ingredients from its European brands.

Within a week, nearly all major food companies followed suit, leaving Monsanto's ideal future in tatters. That rejection by manufacturers has kept nearly all GM foods (other than milk and meat products from GM-fed animals) out of Europe in spite of official approvals of GM varieties by the EU Commission.

But the biotech industry did not roll over. It has steadily pushed its agenda, but more quietly than before. Nearly every natural food crop now has a genetically engineered version produced in a lab somewhere, with at least 172 species grown outdoors in field trials. With pressure from the industry and the US, and in spite of doubts over their impact in terms of health and the environment, the European Commission last year approved new GM crops for cultivation for the first time since the 1999 consumer revolt, and in a vote in June this year, the European Commission allowed accidental GM contamination of organic products at levels up to 0.9 per cent.

Animals reject GM

Eyewitness reports from farmers and scientists across North America describe how, when given the choice, several varieties of animals – including cows, pigs, deer, elk, raccoons, geese, squirrels, mice and rats – avoid eating GM plants and feed. It's possible the animals instinctively know or sense what we are only just beginning to see.

Lab animals forced to eat GM food showed

damage to virtually every system studied. They had stunted growth, bleeding stomachs, abnormal and potentially pre-cancerous cell growth in the intestines, impaired blood cell development, misshapen cell structures in the liver, pancreas and testicles, altered gene expression and cell metabolism, liver and kidney lesions, partially atrophied livers, inflamed kidneys, less developed brains and testicles, enlarged livers, pancreases and intestines, reduced digestive enzymes, higher blood sugar levels, increased death rates, higher offspring mortality and immune system dysfunction.

Reports from the field are similarly alarming. About two dozen US farmers report that GM corn varieties caused thousands of pigs to

'The biotech industry did not roll over. It has steadily pushed its agenda, but more quietly'

become sterile. Some also reported sterility among cows and bulls. German farmers link cow deaths to one variety of GM corn, while Filipinos link another variety to deaths among water buffaloes, chickens and horses. When 71 Indian shepherds let their sheep graze on Bt cotton plants after harvest, within five to seven days 25 per cent had died. The 2006 death rate for the region is estimated at 10,000 sheep. This year, more deaths were identified and toxins were also found in Bt cotton fields. Post mortems showed severe irritation and black patches in the intestines and liver of the sheep, as well as enlarged bile ducts. Investigators concluded that preliminary evidence 'strongly suggests the sheep mortality was due to a toxin... most probably Bt-toxin.'

Should humans be worried?

The biotech industry argument is that millions have eaten GM foods for years without a problem – but how would it know? There is no surveillance system in place that could identify problems if they did arise. The Canadian government announced in 2002 that it would undertake such monitoring, but abandoned its plans within a year on the grounds that it was too difficult. There are not even human clinical trials. Some GM varieties are approved before any human has ever eaten them.

Soon after GM soya was introduced into the UK, researchers at York Nutritional Laboratory, Yorkshire, reported that allergies to soya had skyrocketed by 50 per cent in a single year. Although no follow-up studies were done, there are many ways in which genetic engineering

could be the culprit. Allergic reactions occur when the immune system encounters something it interprets as foreign, different and offensive, and reacts accordingly. All GM foods, by definition, have something foreign and different about them. And several studies show that they provoke reactions.

Although biotech advocates describe genes in terms of Lego, snapping cleanly into place, the process of creating a GM crop can produce massive collateral damage in plant DNA. Native genes can be mutated, deleted or permanently turned on or off, and hundreds may change their levels of protein expression. The result may be an increase in an existing allergen or the production of an entirely new one. Both

appear to have happened in GM soya.

Levels of one soya allergen, trypsin inhibitor, were as much as seven times higher in cooked GM soya when compared with a non-GM variety. Another study verified that GM soybeans contain a unique, unexpected protein, not found in controls, that reacts with immunoglobulin E (IgE), the principal antibody involved in allergic reactions. This suggests the potential for dangerous allergic reactions. The same study revealed that one human subject showed a skin-prick immune response to GM soya only, not to natural soya.

In addition, a protein in natural soya cross-reacts with peanut allergies. This means soya may trigger reactions in some people who are allergic to peanuts. This cross-reactivity could theoretically increase in GM varieties. Thus, the doubling of US peanut allergies in the five years immediately after the introduction of GM soya might not be a coincidence.

GM soya also produces an unpredicted side effect in the pancreas of mice – a dramatic reduction in the production of digestive enzymes. If fewer enzymes cause food proteins to break down more slowly, there is more time for allergic reactions to develop. Thus, digestive problems from GM soya might promote allergic reactions to a wide range of proteins, not just to soya.

To make matters worse, the only published human feeding study on GM foods verified that portions of the gene inserted into GM soya transfers into the DNA of human gut bacteria. This means that, years after people stop eating GM soya, they may still be exposed





to its potentially allergenic protein, which is continuously produced inside their intestines.

Monsanto's 'Roundup Ready' GM soya is planted in 89 per cent of US soya acres. A foreign gene from bacteria (with parts of virus and petunia DNA) is inserted, which allows the plant to survive applications of the otherwise deadly Roundup herbicide. Because people aren't usually allergic to a food until they have eaten it several times, we don't know in advance if the protein produced by bacteria, which has never been part of the human food supply, will provoke a reaction.

As a precaution, scientists compare the amino acid sequence of the novel protein with a database of known allergens. If there is a match, according to criteria recommended by the World Health Organization (WHO) and others, the GM crop should either not be commercialised or additional testing should be done. Sections of the protein produced in GM soya are identical to known allergens, but the soybean was introduced before WHO criteria were established, and the recommended additional tests not conducted.

GM corn is also problematic. Rats fed Monsanto's GM corn, for example, were found to have a significant increase in blood cells related to the immune system. GM potatoes caused the rats' immune system to respond more slowly. And, when produced within GM peas, a harmless protein was transformed into a potentially deadly allergen. The peas and potatoes were not commercialised, but they had passed the superficial tests usually carried out in the approval of most GM crops. Crops that did make it to the market, however, may be triggering immune responses in the unsuspecting population.

'If you ask the average American whether they have eaten a GM food, 60 per cent will say no'

Cleaning up the food chain

In 2003, I interviewed GMO campaigners worldwide about their methods and successes, in order to develop a plan for the Institute for Responsible Technology (IRT) that would help remove GMOs from the marketplace. Unlike many other organisations, which are focused on containing GMOs – by limiting the territory of cultivation or preventing new varieties, for instance – IRT's goal is to eliminate the current generation of GM crops, which it believes is unsafe. Intelligent activism from individual consumers and groups could easily

GM-free zones?

The advancement of GMOs in Europe and elsewhere has not been without protests. Indeed, the stream of GM crops approved for import have consistently been rejected by the majority of member states. Poland, Greece, northern Austria and, as of June, Ireland, are seeking to enforce a bans against planting GM crops, but the European Commission has branded these GM-free zones illegal. Brazil, which grows GM soya, may be introducing corn and cotton starting this year, but approvals are being challenged in the court. Australian states' moratoria on GM crops will expire in 2008 and there is a pitched battle over possible renewals. GM cotton has gained a foothold in India, but thousands of farmer suicides linked to poor crop performance, as well as animal deaths and allergic reactions among cotton workers, are fuelling resistance there. And looming large on the horizon are GM biofuels, the new poster child of the

accomplish this in as little as 24 months.

The undisputed driver of the GMO doctrine is the United States. The first Bush Administration fast-tracked the GM approval process in 1992, hoping this would increase exports and US dominance of food markets. The opposite ensued, and soon the government was shelling out \$3 billion to \$5 billion a year in subsidies to prop up prices on the GM crops no-one wanted. Rather than giving up on the unpopular technology, the US tried to force other countries to accept GM, resorting to

World Trade Organization (WTO) lawsuits against the European Union, GM food aid for famine-stricken nations, even threats to withdraw funds for AIDS relief if GMOs weren't adopted by African nations.

If GMOs are to implode worldwide, the US must be ground zero.

About 9 out of 10 processed foods in the US contain unlabelled GM ingredients, many produced by the same companies that sell only non-GM products in Europe. Why didn't US consumers react like the Europeans in the wake of the Pusztai scandal? The fact is that

industry, which hopes that biotechnology will be embraced as a solution for global warming.

Decisions being made in Europe and around the world at this time are critical, and will help decide whether the biotech industry can reincarnate its genetically engineered future. The industry paints the picture that agricultural biotechnology is a 'done deal' that must coexist with natural varieties, but this is not the case. GM can be stopped. Given the substantial evidence for adverse health effects and the difficulties of containing GM contamination in the wild, ending the genetic engineering of the food supply appears easier than managing it.

The Institute for Responsible Technology plan to take GM out of the marketplace addresses only food made from GM crops, and not GM-produced enzymes, GM animals or non-food GM crops such as trees and biofuels. These issues will be addressed in a subsequent campaign.

the US press did not even mention the story. Project Censored – a group that tracks the news published in independent journals and newsletters and compiles an annual list of stories of social significance that have been overlooked, underreported or self-censored by the major national news media – described it as one of the 10 most underreported events of the year.

Because the US press rarely mentions GM foods at all, if you ask the average American whether he or she has ever eaten a GM food in their life, 60 per cent will say 'no' and 15 per cent will say 'I don't know.' GMOs flourish on the basis of consumer ignorance, but this leaves the biotech industry extremely vulnerable. If some campaign or event were to push this issue above the national radar screen, causing sufficient consumer concern, US manufacturers would respond like their European counterparts and swear off GMOs.

The power of the market

The tipping point to trigger a non-GMO food revolution in the US does not require that a majority of shoppers reject GM foods – if even a small percentage started switching brands based on GMO content, major companies would spot the trend, see a loss in market share and respond. This is facilitated by the fact that manufacturers gain no benefits

from GM ingredients; requesting their removal is not like asking them to take out sugar or fat. GMOs do not make a product tastier, healthier or more appealing.

Even five per cent of the US population – 15 million people or 5.6 million households – making brand choices based on GM content may be more than the critical mass needed to force change. With little exaggeration, Oprah Winfrey could end the genetic engineering of the food supply in 60 minutes. A popular film such as a GMO version of *An Inconvenient Truth* might accomplish it as well.

Even if these things are not forthcoming, however, there are several sub-groups within the US that are large enough and receptive enough to drive a transformation. Chief among these are health-conscious shoppers, and they are already being rallied to the cause.

Currently, 28 million Americans buy organic products on a regular basis. Another 54 million are considered 'temperate' organic shoppers. Together they account for approximately 27 per cent of the population. According to a December 2006 poll, 29 per cent of Americans (probably many of the organic buyers) are strongly opposed to GM foods and believe they are unsafe. But most do not conscientiously avoid GM ingredients in their non-organic purchases; they usually don't know how. That's about to change.

In spring 2007, a coalition of food manufacturers, distributors and retailers in the natural products industry, along with the IRT, launched an initiative to remove GM ingredients from the entire natural food sector. This comprehensive initiative – called the Campaign for Healthier Eating in America (www.americanwellnessnetwork.com) – will educate consumers about the health risks

'Most US shoppers do not avoid GM ingredients in non-organic purchases. That's about to change'

of GM foods and promote non-GMO brands through in-store non-GMO shopping guides. Within approximately 18-24 months, it is expected that nearly all the food brands sold in natural food markets will have achieved non-GMO status. At that point the campaign will provide in-store, on-shelf labels for retailers to indicate to consumers any of the few remaining holdout products that still 'May contain GM ingredients'.

Shopper education will be provided through GMO-education centres in natural food stores

Keeping GM off the menu

- Stay informed. Log on to the Institute for Responsible Technology website (www.responsibletechnology.org) for updates on its campaign to ban GM in the food chain. Organisations such as Friends of the Earth (www.foe.co.uk), Greenpeace UK (www.greenpeace.org.uk) and GM Freeze (www.gmfreeze.org) raise public awareness, campaign against the use and contamination of GM food, question assumptions about GM, challenge the secrecy surrounding biotech companies and expose contamination scandals.
- Take action. Write to local supermarkets, or use their comment boxes. Tell them you want all animal products to be non-GM fed and ask for a deadline by which they intend to implement this. Animal produce (such as dairy or meat products) from animals that have been fed GM does not by law have to

be labelled. Let those in authority know this must change.

- Appeal to your MP. Suggest they write to Defra minister Hilary Benn to request that Government legislation and Defra's regulations be more stringent surrounding GM produce. Follow the links on www.stopgmcontamination.org for a simple way to send a letter or email to your local MP.
- Let your money talk. Buying organic sends a strong message to food producers about what is and isn't acceptable. In the EU, food accidentally contaminated with up to 0.9 per cent genetically modified content can be labelled 'GM-free'. But the Soil Association and Organic Farmers And Growers, which together certify more than 90 per cent of Britain's organic food, have pledged to keep their own criteria at 0.1 per cent.
- Grow your own. Get control over what you eat, save money, reduce food miles and reconnect with nature. You don't need an allotment: growing edible plants in pots and window boxes can be liberating.

nationwide, as well as regular features on websites and in magazines and newsletters. By providing health-conscious shoppers with information showing that 'Healthy Eating Means No GMOs', and by offering clear choices in the store, brands that do not contain GM ingredients will have the clear advantage.

The mechanics of the sector-wide cleanout is being orchestrated by an organisation called The Non-GMO Project (www.non-gmoproject.org), which is establishing a uniform standard for defining non-GMO and a low-cost, online, third-party verification programme to ensure that farming and

production methods meet that standard. The membership of their board of directors illustrates the far-reaching support for this unprecedented initiative in self-regulation. It includes executives from the multi-billion-dollar Whole Foods Market and United Natural Foods, as well as industry leaders such as Eden Foods, Lundberg Family Farms, Organic Valley and Nature's Path.

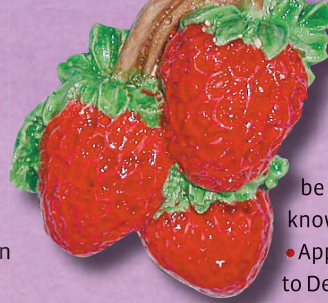
Organic products are included in this programme: they are not allowed to use GMOs and have been an important oasis for non-

GMO shoppers – and yet research shows that some batches of organic seed and crops contain tiny amounts of GM contamination. If unchecked, this can grow over time. By including the organic sector in the campaign, organic producers will use GMO testing methods and procedures that will help clean up seeds and crops and ensure that certified organic foods continue to be a trusted source of non-GMO products. Unlike the recently enacted EU threshold for allowable 'adventitious' contamination of organic products by as much as 0.9 per cent, the standard for non-GMO claims will take into consideration current levels of purity and will in all likelihood require progressively cleaner levels in subsequent years, based on successful efforts to remove GMO contamination.

This initiative, which is akin to an immune response to GMOs by the natural food industry, could easily set the stage for the elimination of GM ingredients throughout the conventional foods industry as well.

Mobilising support

Health-conscious individuals and groups outside the food industry also have a major role to play in cleaning up the food chain. Parents with young children, for example, are the ones most likely to switch to a healthier diet – for the sake of the children. Such care



is warranted, as young, fast-growing bodies are more at risk from potential toxins, allergens and nutritional problems – all three of which are associated with GMOs.

With the epidemics of obesity and diabetes, as well as the increased medication of children for ADHD and depression, the focus on their diets, both at home and at school, is now 'on fire' in the US and elsewhere. Adding

help patients follow the prescription to avoid GM foods. Many religious organisations, too, have denounced GM foods on the basis that such mixing of species is against natural law. They equate the concept of 'GMO' with 'God, Move Over'. Large religious organisations have not yet asked their membership to avoid buying and eating GM foods, however. With the ability to activate millions, religions are

through these education-based strategies, the IRT expects the synergy of information and activism to take effect.

A key advantage of addressing the problem of GM food in this way is that it does not rely on governments to step in; it places the mantle of leadership on consumers who are, after all, at the top of our food chain. By making healthier choices for themselves and for their families, they can quite quickly, and quite literally, change the world. **E**



'With the ability to activate millions, religions are the sleeping giants in the GM debate'

compelling information about the impact of GM foods on children's health can leverage the media coverage, community organising, and school-meal reorganisation already taking place. In the US this is the role of the GM-Free Schools campaign (www.gmfreeschools.org), which is active in several states.

On the basis of potential adverse health effects, several healthcare organisations in the US are now providing educational materials to healthcare providers in order to

the sleeping giants in this debate.

On their own, action by any of these groups is capable of forcing the hand of the US food industry. When company executives learn that a major religion is instructing millions of its followers to avoid their brand, that doctors are prescribing the same, that parents believe the company's foods can hurt children or that millions of trend-setting health-conscious shoppers shun their products, the end is near for GM foods. Over the next two years,

Jeffrey M. Smith is the director of the Institute for Responsible Technology and the Campaign for Healthier Eating in America. He is the author of the international best-seller *Seeds of Deception* (www.seedsofdeception.com). His latest book is *Genetic Roulette: The documented health risks of genetically engineered foods* (Yes! Books, £15.95).



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Green phoenix

The UK's plant-life equivalent of the British Library is under threat. **Dan Marcus** laments the short-termism that leaves us exposed to climate change fallout

Deep in rural Sussex at Wakehurst Place, in a large nature reserve of 500 acres of National Trust woodlands and lakes, stands the Kew Gardens Biological Research Centre. Sixty feet beneath is a nuclear bunker. This is the British National Doomsday vault, home to the UK's Millennium Seed Bank (MSB). If apocalyptic disaster strikes, this bunker will hold key bio-scientists and all remaining plant life.

The MSB is the largest single conservation project in the world; the fulcrum of a network that spans the globe, involving hundreds of scientists and researchers – the seed-protectors – who dispatch their finds in airmail packages from 80 centres around the world. When the work is complete, Kew's MSB will hold the seeds of 30 per cent of the green germ plasm on the planet – around 200 main plant species – that could be used for food crops.

At the bottom of a steep spiral staircase is a massive steel blast- and fire-door, made by Chubb safe company, which leads to a white

sterile airlock and, beyond that, a rarefied atmosphere, where special air-conditioning maintains low temperatures and zero humidity. Off the central hub are the seed rooms where the temperature is kept at -20°C, to protect the seeds, hold them in 'suspended animation' and stop them from germinating. Endless racks hold row upon row of Kilner jars, each sealed to protect its contents for up to 500 years.

Here our plant history is being archived. It's the biological equivalent of the British Library – and both stand testament to the development of our civilisation.

The contents are rightly prized and rightly secure – plant libraries such as Kew's MSB are a lifeline that might at some time in the future be called upon to feed an entire world. As is the way with these things, America has its own MSB equivalent – the Crop Preservation Trust – as do China and Russia. Everywhere, they are viewed as being critical backstops in an uncertain world.

Climate change is not just emerging in the form of climate shocks and unpredictable

weather patterns, it is also manifesting itself in the form of new pathogens and plant viruses. If an epidemic disease should strike a major food crop, then millions could starve. If a deadly bacterium wiped out half of China's rice crop, 1,300 million people would be in peril. The only salvation might lie in the seed banks; in the form of 'old' seeds with genetic resistance.

In America, Fort Collins in Denver has provided just such an emergency seed service for the past 50 years. Its seeds have been sought to address threats of wheat scab, plum poxes, potato blight and citrus cankers and provided back-up when wars, typhoon and drought have wreaked havoc.

The increasing homogenisation of agriculture compounds the threat posed by climate change. There are an estimated 27,000 potentially usable undomesticated wild food and commercial crop plants, yet all plant food we predominantly eat today is derived from just 37 existing species. A



further threat to our resilience to any potential epidemic comes from genetic modification, which results in an increasingly narrow number of breeds.

At the G8 summit in Germany in June, scientists warned world leaders that, as a result of climate change, population growth and industrial agriculture, two thirds of the planet's wild plant species could be extinct by 2100. This, they said, would seriously damage conventional domesticated plant agriculture. There would be an explosion of pests and simultaneously a collapse in food

built on images of biodiversity. I will despair if we cannot find the money – around one-thousandth of one per cent of our annual GDP – to continue and accelerate our work after 2009. It is in all our interests – government and industry as well as private citizens. For our children's children to meet the challenges of an uncertain future, they need the greatest biological inheritance we can bequeath them. To knowingly fritter away even part of that inheritance is selfishness for which they will rightly condemn us.

'I will doubly despair, as so many of our partners are from countries whose citizens have benefited nowhere near as much as we have from environmental change and industrialisation. Yet, though not responsible, they will be amongst the first to face the damaging effects of these changes to their

like Derek Tolman of Bernwode Nurseries, say means Defra is failing to fulfil the stated aim to conserve 'in particular that which has been grown in or originated in the UK'.

Over the past few years new 'accessions' to the collection have dwindled, seemingly reflecting a decision to not retain varieties that have also grown elsewhere and are held in another country's seed bank.

There are many inherent problems with such a policy, not least the vulnerability of many institutions in the seed bank network. The seed banks in Iraq and Afghanistan fell victim to the respective wars in those countries – not by bombing but by looting and destruction that was allowed in the aftermath of the invasion. In 2006 the Philippines lost its entire seed bank to



plant pollination, which would devastate global food production and make mass starvation a distinct possibility.

Against such a backdrop, the green phoenix of our seed bank, which could allow us to rise from the ashes, is itself under threat.

Bizarrely for such a critical record, the MSB has been reliant on Lottery Funding and this is soon to cease. In 1997 the Millennium Commission awarded the project £30m, on the proviso it was matched by public and industry donations. In 2009 this award runs out, threatening the chances of the project ever being fully realised. Any hope or expectation that funding from another Lottery stream would be forthcoming has been dashed by the seemingly insatiable demands of the 2012 Olympics.

Roger Smith, the former head of the seed bank project and now its champion and adviser, told the *Ecologist*, 'We live in a country with a gross domestic product (GDP) of over £1.3 thousand billion, where all three major political parties now parade logos

livelihoods and wellbeing. To refuse them the insurance that the seed bank offers at such little cost, would betray our national reputation for environmental leadership matched with action.'

Many environmentalists believe that leaving the MSB to survive on charitable handouts is a grave mistake. They also fear that it may be placed under private control, as is happening to the National Fruit Collection at Brogdale, Kent.

Here, the custodians of thousands of varieties of native species of apples, pears, plums, apricots and cherries among countless others, are currently homeless, having previously entered into a sale and leaseback deal with a developer to cut costs. At the same time Defra has invited tenders from the private sector to take over the running of the institution. The winner was set to be announced this autumn, but due to the failure of all the bidders to meet the required criteria the tender document has been reissued.

Its hand to mouth existence in recent years has resulted in policy changes which some,

floods. Hurricanes in 1998 accounted for the one in Honduras. Shoestring funding is a more subtle and chronic threat in many countries, resulting in places like the MSB being increasingly seen as a luxury item on the bottom line, when in truth they are our lifeline. The Millennium Seed Bank is our insurance policy against climate change, and we should pay the premiums. **E**

What you can do:

Create your own seedbank. Kits are available from Kew's Millennium Seed Bank Project (MSBP), priced £19.95. To buy a kit and find out how to donate to and/or visit Kew's MSBP, log on to www.kew.org/msbp

For community seed bank projects: Advice can be found at www.farmradio.org (search for 'seed banks')

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Discrete year performance (%) as at 30 June 2007*

	Jun 07 Jun 06	Jun 06 Jun 05	Jun 05 Jun 04	Jun 04 Jun 03	Jun 03 Jun 02
Henderson Global Care UK Income Fund	+19.8	+19.3	+17.7	+11.6	-5.5

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Energy

The earth's reserves of fossil fuels and uranium are coming to an end faster than forecast, threatening both a climate and economic meltdown. But **Jon Hughes** and **Mark Anslow** argue that the UK's renewable capability means the future should be bright

Energy. Apparently, David Cameron has lots of it; Gordon Brown is strictly AC-DC; and Menzies Campbell is renewable. That is how the leaders of the UK's main political parties (Conservative, Labour and Liberal Democrat) were being described at the beginning of October, in the aftermath of their respective party conferences and the general election false start. It is a reflection of the business-as-usual collusion between media and politics that energy is viewed through the prism of personality politics rather than as the critical policy issue of the century.

Our profligate use of fossil fuels is the cause of climate change, and unless we take urgent action to reverse this trend we face climate catastrophe; apocalypse now. Yet energy is also the lifeblood of modern society. Without it we don't have heat, light, cars, computers and digital archives. On current proven reserves and predicted usage of the world's remaining reserves of fossil fuels and uranium, we could be struggling to keep these functions going in as little as 30 years.

This then should be the best of times. The converging crises of energy security and climate change dictate what we should do: defend the climate and end the energy crisis.

Stop using oil, gas and coal and we might just stabilise carbon emissions at a level to keep global climate temperature from rising far above a genocidal 2°C by 2050.

Policy in the UK is being set with this target in mind – by cutting emissions by 60 per cent against 1990 levels – although not the means of achieving it. This is starting to look like the worst of times, as the UK is the recognised world leader on the issue of climate change – a position it secured by virtue of being the first to articulate the threat posed by climate change and announce its intention to act to bring it under control. By taking the lead, the Government as a G8 economic superpower

Future energy

says it will set an example that others will follow. Sadly, the Government talks the talk but fail to walk the walk.

This month (November) the energy white paper (EWP) enters parliament. There's something in it for everyone. An 'energy mix', trumpets the Government; an 'energy mish-mash', say its many detractors, fatally sending out confused signals.

In that way, it reflects its own genesis and the alarming downgrading of energy as a policy issue. Rather than being the responsibility of a dedicated ministry (as it was until 1992), the UK's energy portfolio is scattered to the winds in Whitehall. Energy

policy is, perhaps tellingly, the ultimate responsibility of the Secretary of State at the Department of Business, Enterprise and Regulatory Reform; is regulated by Ofgem; energy efficiency and climate change is the responsibility of Defra; and R&D innovation falls under BERR. There have been nine energy ministers and three energy reviews over the past decade. The end result is a white paper that has barely changed over that period and is evidently a piecemeal construct rather than a dedicated policy.

In May this year, the now Chancellor Alistair Darling was in the energy hot seat and made a statement to the House of Commons

on the energy white paper. It sets out, he said, to address the two big challenges that we face: climate change and energy security. 'Both are vital to our future prosperity... If not tackled, climate change poses catastrophic human consequences and economic costs.

'Meanwhile,' he continued, 'world demand for energy continues to grow. It is expected to be 50 per cent higher by 2030 than it is today and is likely to be met largely by fossil fuels for some time to come. This means rising greenhouse emissions and greater competition for energy resources, which has massive implications for both climate change as well as security of supply.'

Yet you wouldn't tell that this is the premise from the solutions posited in the paper. Renewables and energy conservation and efficiency are part of the mix, but it is coal, gas, nuclear and the creation of a strong carbon market that get the Government's fulsome support.

Consequently, when the white paper is enacted – which it will be, barring an unprecedented *volte face* or rebellion – we are going to build a fossil fuel (and probably nuclear) infrastructure. One that, in 30 years' time, there is a distinct possibility we will be unable to fuel with constancy and at an acceptable cost.

S. David Freeman is 81, one-time energy adviser to Presidents Johnson, Nixon and Carter, and career head of America's largest public energy companies. In his latest book, *Winning Our Energy Independence (An Energy Insider Shows How)*, he writes: 'A continued massive use of fossil fuels and nuclear power is an almost certain path to havoc and destruction of the high-energy civilisation we enjoy.'

In practical terms, the critical problem with fossil fuels is that in the very near future there is going to be no security of supply, as a result of their impending scarcity.

Without doubt, oil has peaked. Not only is less crude being found; known deposits have for years been exaggerated. Senior Shell executives in 2004 admitted hyping reserves by at least 20 per cent, possibly twice as much. Kuwait and Saudi Arabia have also quietly revised their claimed reserves downwards by around 50 per cent for their respective largest fields. Price is rising accordingly.

Middle East energy and oil analyst Ali Bakhtiari told Al Jazeera TV two years ago: 'No one can restrain the price any more. For example, everyone thought that it would be

Clean Coal

Carbon capture and storage (CCS) is the technology of stripping carbon dioxide from the exhaust gases of fossil fuels and then burying it as a liquid underground.

The technology is seductive. Coal is the most abundant fossil energy source on earth, reserves are reasonably well distributed throughout the world, and carbon has already been successfully buried at three locations worldwide.

The most well known is the Sleipner gas rig in the North Sea, operated by oil giant Statoil. The natural gas which the rig was built to extract was found to have a CO₂ level which is too high to pump into people's homes. Statoil used to strip out this excess CO₂ and pump it straight into the atmosphere, but then found that it could save hundreds of thousands of euros in carbon taxes by capturing the CO₂ and pumping it down into a saltwater aquifer deep under the North Sea.

Another project in the US takes CO₂ produced by a coal gasification plant in North Dakota (built to produce synthetic natural gas from coal) and pipes it up to Weyburn in Canada, where it is used to force extra oil out of an ailing well. A third site, Salah in Algeria, uses the same principles as the Sleipner project for natural gas refining.

These three projects have one thing in common: none of them are generating electricity. The technology which is needed to either strip CO₂ from the toxic, complex fumes of a coal power plant, or to extract the CO₂ before the coal is

burnt, is still untested on a commercial scale. Moreover, finding geologically suitable strata in which to inject the liquefied, highly pressurised CO₂ is difficult. Although the UK has a number of spent oil and gas fields in the North Sea which could serve for purpose, a recent study which examined China's potential storage sites concluded that further work is needed to see whether carbon capture and storage is viable. A lack of suitable sites means longer pipelines to transport the carbon to where it can be buried (and hence, more energy), or the transporting of liquefied CO₂ by ship to a suitable repository.

Jon Gibbins, Senior Lecturer in Engineering at Imperial College London and an expert on CCS, estimates that a 'clean coal' plant would require between 25 and 30 per cent more fuel than a conventional one in order to capture and store 90 per cent of its CO₂.

This means that if Drax power station in Yorkshire were to be made capable of carbon capture and storage, it would require an extra 9.5 million tonnes of coal every year simply to provide the energy for the process of cleaning up emissions.

Although the UK has little need of coal, being so rich in renewable resources, the responsibility to pioneer carbon capture technology may fall to us as a huge historical emitter of carbon dioxide.



OPEC who could manage demand. But that is now in the past. Now it is really peak oil that is behind the wheel of the car. Peak oil is driving the rise in price and demand is not the real question. We are entering a new era, but we are only at the very beginning of it.' At that time, Bakhtiari broke ranks with the industry and predicted the price of oil hitting \$50 a barrel by the end of 2005. He was right.

The latest prediction is for oil to hit \$100 a barrel by the end of next year. Speaking at the 6th annual conference of the Association for the Study of Peak Oil and Gas in Ireland in September, CIBC World Markets chief economist Jeff Rubin told delegates that the export capacity of OPEC, Russia and Mexico will drop by 2.5 million barrels per day by the end of the decade.

'Domestic demand growth of as much as five per cent per year in key oil-producing countries is already beginning to cannibalise exports and will increasingly do so in the future as production plateaus or declines in many of these countries,' says Rubin. 'OPEC members,

'Now peak oil is behind the wheel, driving the rise in price... We are entering a new era'

together with independent producers Russia and Mexico, consume over 12 million barrels per day, surpassing Western Europe to become the second largest oil market in the world.

'At current rates of domestic consumption, the future export capacity of OPEC, Russia and Mexico must be increasingly called into question,' Rubin points out. 'These trends are likely to result in a sharp escalation in world oil prices over the next few years.'

The impact to our economy is inescapable. In 2006 (at 2006 prices) the UK imported £24 billion worth of crude and refined oil. What the price will be in five years' time, when the predicted 'oil crunch' hits, is anyone's guess.

The imminent collapse in supply means oil companies are engaged in ever more extreme and costly adventures to find more. America, Russia, Norway and the UK are currently jockeying for position at the Arctic Circle to stake a claim to the oil deposits that lie below the melting ice. The UK is hovering in the Atlantic at Rockall, off the coast of Ireland, where it is believed there are oil and gas fields. The USA is set to tear up Alaska. China is quietly colonising Africa to get its hands on

its oil and mineral wealth.

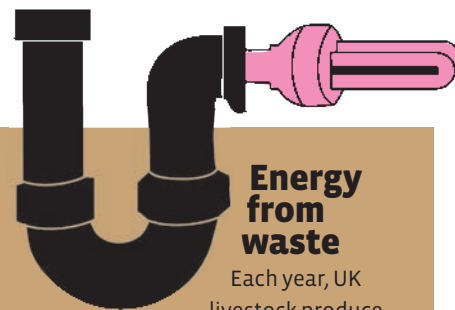
As they scour the earth for ever more remote and therefore ever more expensive reserves of crude, the oil companies are also turning to making oil for fuel from tar sands and coal shale. Both are environmentally devastating and both have risible energy returns on energy invested (EROEI, see graph p 45). On the industry's own most optimistic figures there is an energy return of three units out for every one unit in, for the process of extracting the crude from the tar and shale alone. If the energy used in mining and transportation are taken into account, the true return is at best half that; the net gain in energy is perhaps half a unit. This alchemy is only considered viable because of the incontrovertible fact that the cost of crude will continue to rise.

Oil's primary use is for transportation. The likely price hike will hit the pumps and will force up the cost of everything that is transported, everywhere it is transported. If supplies are suddenly scarce, the only option will be enforced rationing. This was concluded at an International Energy Agency (IEA) conference, Cutting Oil Use In A Hurry, in 2005. The future is emergency rationing, tele-working and car-pooling.

Food supply wasn't addressed at the conference but the oil crisis will certainly force up the cost of production. Oil is food, and has been since the 'green revolution' – which was how industrial farming was introduced in the Seventies – when it was discovered that oil, in the form of petrochemical fertiliser, increased crop yields. Today we are reliant on these oil-based yields but they won't be there in years to come.

Not only will the oil not be there to stimulate crop growth, the degraded soil will take years to recover. This year, the 'unpredictable weather' has led to universal falls in yield of most staple food crops; and in 2006, the UK for the first time had to import more food than it produced. We have to brace ourselves for more to come. Around the world, the UN reports, 34 countries are facing long and sustained food shortages as a result of a changing climate.

Like oil, natural gas has peaked – we are using more than we are finding. On the most optimistic forecasts we can rely on supplies for perhaps 130 years on current rates of global usage. But because it is the cleanest of all the fossil fuels, and countries like America have seen their domestic supplies



Energy from waste

Each year, UK livestock produce some 60 million tonnes of collectable

faeces. If left to run into water-courses or even spread on fields, this waste can lead to the same problems associated with excessive fertiliser use – algal blooms and aquatic life starved of oxygen.

If, however, this waste is captured and placed in a sealed, airless container known as a biodigester, then microbes within the solids begin to turn the slurry into CO₂ and methane.

Research has shown that digesting just 6.6 tonnes of cow manure can produce enough gas to generate 186 kWh a day of electricity and 138 kWh a day of heat energy. This is sufficient to provide steady electricity for 20 homes, or heat for six. If small, farm-based biodigesters were to make full use of the UK's yield of animal waste and supply excess power to their neighbours, some 1.6 TWh of electricity – nearly 1 per cent of UK domestic electricity requirements – could be generated from what is essentially waste.

Food waste has similar potential. The Government's Waste and Resources Action Programme calculates that biodigesting the 5.5 millions tonnes of food waste sent to landfill each year could generate between 477 and 761 GWh of electricity every year, meeting the needs of 164,000 households, and saving up to 3.6 million tonnes of CO₂, partly by avoiding climate damaging methane emissions from the rotting produce.

The gas given off by the UK's landfill and sewage processing sites is already widely used as a renewable source of electricity, but is under-exploited. Research by the European Environment Agency in 2006 showed that the UK could produce 85 TWh of heat energy from biodegradable waste and sewage – equivalent to one eighth of our current demand.

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peak, demand is rising dramatically on the world markets and some analysts predict its long-term availability being half that. In May, the IEA warned that 'there are prospects of even tighter natural gas markets at the turn of the decade'.

In the UK, the North Sea supply has peaked, so we'll be increasingly reliant on Russia – the world's now predominant energy superpower – for natural gas. Russia, which recently took to flying spy plane missions again and announced its intention to become the world's largest manufacturer of military aircraft. Russia, which, last year, in a dispute over charges, turned off the gas supply to the Ukraine for two days. It will be both an increasingly risky and increasingly costly supply of fuel; a cost also reflected in influence as scarcity bites.

In 2006, the UK imported 22 billion cubic metres of natural gas at a cost of £2.5 billion. Ultimately, as with oil, we know it will be kept for the domestic market and use by allies.

Coal, then, is the last great fossil-fuel generator and is enjoying a renaissance. 'Clean coal' is how it is known these days. Of course, the coal isn't clean. Instead, the carbon dioxide (CO₂) from burning the coal is removed from the exhaust gases in a process known as carbon capture and storage (CCS) or zero emissions technology (ZET). Once the emissions are captured, the carbon is either piped or transported by tanker to a pump station where it is driven under pressure, to a geological formation like an exhausted oil well. According to Daniel Shragg, climate science advisor to Al Gore on *An Inconvenient Truth*, the east coast of America has many such formations. The 132 coal plants currently planned for America are in the mid-west and none have this technology installed. Nevertheless, this highlights a fundamental

Energy glossary

kilowatt-hour (kWh): A kilowatt-hour is the standard 'unit' of power that appears on your bill. In the UK, the average household uses 3,300 kWh of electricity and 20,500 kWh of gas every year.

megawatt-hour (MWh): One megawatt-hour is equal to 1000 kilowatt-hours.

gigawatt-hour (GWh): One gigawatt-hour is 1000 megawatt-hours.

terawatt-hour (TWh): One terawatt-hour is 1000 gigawatt-hours.

question about the viability of CCS: How do you police it? How do you calculate emissions where production is not constant? How do you ensure it is tankered and delivered, especially in times of energy shortages?

Ultimately, there is something of a myth surrounding coal. Deposits only look substantial compared to our dwindling supplies of oil and gas. In 2006, the UK imported 50.5 million tonnes of coal (90 per cent of current usage), at a cost of £2.2 billion.

'If we burn all the reserves of coal alone global temperatures will rise by 10–12°C'

For how long will there be security of supply? If, globally, we burn it all, at current rates of usage, there's enough to last 200 years. If, however, coal is used to fuel growth and compensate for shortages of oil and gas, its longevity diminishes proportionally – to less than 100 years if it becomes the world's primary fuel – and the cost rises accordingly. From what little we know of the principles behind clean coal, the process reduces its efficiency as a power generator, further shortening its prospective long-term viability (see Clean Coal). Taken on its own, coal is nothing more than a crutch to maintain our current way of life for just a few more years.

The dynamics of simple supply-and-demand economics highlights the fundamental problem of pursuing a hybrid fossil fuel future: it is going to become increasingly expensive as the raw materials get nearer to exhaustion. In 2006 we spent nearly £30 billion (at 2006 prices) importing fossil fuels, according to Defra.

We also need to consider the impact on climate change. If we burn all the known reserves of coal alone, the biosphere will suffocate first – global temperatures will rise by 10–12°C. That's the temperature rise that occurred 250 million years ago and caused the Permian extinction – the most cataclysmic event ever known. On the Hadley Centre business as usual forecasts – based on current usage of oil, gas and coal – parts of the world (Africa and the Indian sub-continent) reach this temperature before the end of the century.

The energy white paper is fatally flawed in other ways, too, not least by promoting the belief that a techno-fix is waiting in the wings, which is at odds with its recognition

Nuclear Power

Even among green campaigners, nuclear energy is quietly gaining ground as a potential solution to the impending energy crisis. However several issues – particularly those of raw materials, cost and waste – remain unaddressed within the mainstream of opinion.

In 2001, Dutch chemist and energy systems expert Jan Willem Storm Van Leeuwen and nuclear physicist Dr. Phillip Smith published a paper based on peer-reviewed methodology which showed that when the concentration of uranium ore in mined rock drops below a level of 0.02 per cent, nuclear power uses more energy in the form of fossil fuels than it generates as electricity.

Their work demonstrates that nuclear power faces an identical situation to fossil fuels – there will come a point at which more energy is expended in extracting the fuel from the ground than is eventually available at the plug. The question is, how long will rich uranium ores last?

The most widely accepted estimate suggests that the world's known uranium deposits could fuel the current fleet of reactors for around 42 years. However, this is based on an assumption that the world's nuclear fleet will expand no further. Contrary to this, India has announced plans to build a further 24 reactors, China another 40, Japan 13, Russia 40, and the United States expects private sector applications for another 29.

If these projects go ahead, the demand for uranium will soar. Attempting to supply just 16 per cent of world electricity demand from nuclear power will lead to the exhaustion of rich ore reserves within 12 years, according to environmental scientist and author Paul Mobbs.

The world's largest uranium mine is Australia's Olympic Dam. Operated by mining giant BHP Billiton, it currently mines uranium ore in the region of 0.05 per cent concentration, and is only economic because it also produces

copper, silver and gold. Its future uranium reserves, upon which many of the nuclear industry's hopes are pinned, hover around 0.022 per cent, dangerously close to the level at which nuclear power becomes a net emitter of greenhouse gases.

Despite its 50-year history, nuclear power is still unable to survive without subsidies. The Government has set aside some £75 billion of taxpayer's money to deal with legacy nuclear waste, and has financially guaranteed the decommissioning of two defunct 'Magnox' reactors.

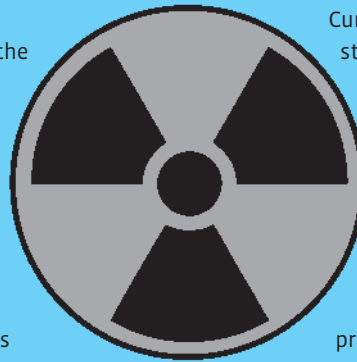
No private sector company will undertake the building of a new nuclear power station without a guarantee that assistance will be available to deal with waste that will last for hundreds of thousands of years.

Currently, the UK has a stockpile of more than 100,000 tonnes of nuclear waste, which is set to grow to at least 500,000 tonnes by 2050, even without new plants.

The nuclear industry is keen to stress that new reactors would produce much less waste than past ones. But The

Campaign for Nuclear Disarmament has shown that the proposed new reactors for the UK, Westinghouse AP1000s, actually produce more high level nuclear waste (HLW) per unit of output than the current fleet of power stations. Figures released by the Government's Committee on Radioactive Waste Management show that while the volume of waste future power stations might produce is not great, it would increase the radioactivity of Britain's stockpile by 165 per cent.

It is this HLW waste that is the hardest – and most energy-intensive – byproduct to deal with. A cocktail of highly radioactive isotopes, including uranium and plutonium, HLW is so radioactive when removed from reactors that it must be sealed and actively cooled in ponds of water for 50 years, or 'vitrified' in glass. In an energy-constrained future, could we afford to pay for this legacy?



Future energy

of the fundamental need to curb energy use. What householder, let alone global businessman with his eye on the bottom line and annual bonus, is going to voluntarily turn off the lights if a techno-fix is on the horizon?

Yet, this is what the white paper implicitly expects. While openly admitting that coal is going to be used as a power generator for the abstract 'some time to come', the EWP proposes a competition to identify a CCS design that could be sent to prototype. Consequently we can't expect to have developed a commercially proven system for clean coal for, at best, 20 years.

Its nuclear scenario is hamstrung in the same way. We are nowhere nearer addressing the safety issues surrounding nuclear or achieving fusion than we were 50 years ago,

when the technology first materialised, promising electricity too cheap to meter.

Meanwhile, the white paper maintains that energy efficiency and conservation will be stimulated by the creation of a carbon market. It can be argued that the threat of an international carbon market is having a beneficial effect, driving industry to clean up its act. A recent Greenpeace audit forecast that renewables would be supplying 20 per cent of the world's electricity supply by 2020. This reflects the piecemeal response to the converging crises that are emerging around the world: people, industry, nations acting autonomously.

It doesn't bode well, however, for an international agreement on a carbon market being achieved, with all its inherent

ramifications for world trade. Look at the refusal of the USA and Australia to ratify Kyoto and the treaty's failure to secure its emissions reduction target of 5.5 per cent on 1990 levels; the intense negotiation already underway over Kyoto 2 (which is set to be signed in 2012), where the emissions reduction target is set to rise by an additional 30 per cent; and the failure to achieve consensus on how to address energy and climate at the 15th session of the UN Commission for Sustainable Development in New York in April and the belief that a carbon market worth its name will emerge looks fanciful.

As Nick Robins, the newly-installed head of the Climate Change Centre of Excellence at HSBC, wrote in the December 2006 *Ecologist*, if the carbon market set a realistic price per tonne based on the environmental damage it caused – a price set at \$85 in last year's Stern Review – then companies such as BP would be bankrupt.

Obviously any future carbon market is going to set a level sustainable to big business, particularly energy suppliers. And it clearly sends out the wrong message – it's OK to continue emitting carbon, at a price.

A domestic carbon market (tradeable quotas) is also envisaged to curb residential use, although this would demand massive

'A carbon market sends out the wrong message – that it's OK to go on emitting carbon'

investment for what is essentially a short-term measure. The reliance on a carbon market to deliver cuts in emissions can only work on a central grid; it would be unable to have a marked impact on a decentralised grid.

Finally, we discover what role renewable technologies have to play in our energy future. The EWP states that by 2015, 15 per cent of our energy needs will come from such sources, a staging post along the road toward achieving 20 per cent by 2020, which we are committed to as a signatory to the EU heads of state renewable energy obligation. However, a DTI briefing paper obtained by the *Guardian* newspaper over the summer exposed this as being beyond our reach. Currently, it says, renewables account for around 1.5 per cent of electricity supply in the UK and admits we don't have a hope of achieving the EU heads of state agreement.

Hydrogen

There is much talk of the possibility of a future 'hydrogen economy', which will power all our vehicles and homes. It is important to remember that hydrogen is not an energy source; it is an energy carrier. To obtain hydrogen it must be split from either natural gas or water molecules. The former, most widely used, method not only requires energy but also gives off carbon dioxide (CO₂) in the process. Hydrogen produced in this way requires more energy to make than will eventually be returned when it is used. It makes more sense from a climate perspective to burn the natural gas itself than to convert and re-convert it to hydrogen in this way.

Hydrogen can also be obtained by passing an electric current through water, in a process known as electrolysis. Although this method is expensive (both in terms of energy input and money), it can be powered by renewable sources of electricity such as wind turbines or solar panels. Even here, though, it makes more sense to use the electricity straight from the wind turbine than to convert it to hydrogen and then back to electricity.

Where hydrogen may actually come into its own is for energy storage, the battery of the 21st century. One of the main criticisms of renewable energy sources is that they are unpredictable – the wind may blow strongly in the middle of the night,

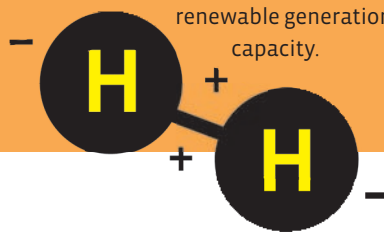
when no-one is around to use the power and all lights and heating systems are switched off. At these times of 'low load', when renewable generators are producing more power than is needed, the electricity could be siphoned off to produce hydrogen from water. When demand rises again the stored hydrogen is run through a fuel cell, which reacts the gas with oxygen to produce water and electricity. Because fuel cells can be miniaturised, the process could eventually take place in your home.

The other great hope for hydrogen is as a transportation fuel. If it can be made from renewable sources, then running it through fuel cells in cars would allow for emission-free travel.

The biggest problem is transportation – hydrogen needs to be cooled to around -250°C, and kept under constant pressure. If the temperature rises, the liquid hydrogen starts to turn into a gas and can escape. Pumping hydrogen gas through the existing network of ordinary metal gas pipes can make them brittle and, as such, a 'hydrogen network' seems to be some way off.

Producing and using hydrogen sustainably is certainly possible, but for this to happen requires first and foremost a huge increase in our

renewable generation capacity.



Wind

The UK has been described as the 'Saudi Arabia' of wind, with some 50 TWh of onshore and at least 450 TWh of offshore power available every year, well in excess of our current electricity demand.

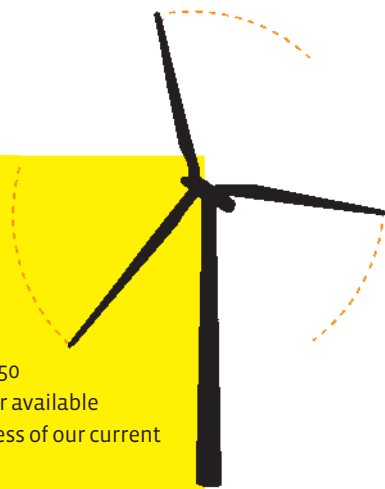
But wind has recently become the whipping boy of environmental technologies. Turbines are branded as ugly and ineffective, generating energy for only a small proportion of the time, and requiring substantial fossil fuel capacity to provide backup for when the wind doesn't blow.

The biggest bugbear is known as 'capacity factor'. This is the percentage figure applied to all power generation technologies, which indicates for what proportion of the year they operate at full, specified output. Onshore wind farms are generally regarded as having a capacity factor somewhere between 30 and 40 per cent, with offshore farms closer to 45 per cent.

Poor reporting in the media has led to this capacity factor figure being interpreted as the amount of time for which wind turbines generate electricity, leading to the popular myth that you only get wind energy for one third of the time. This is quite wrong. Most well-sited wind turbines generate power for 80–85 per cent of the year, but not necessarily at their peak capacity, owing to all sorts of reasons, including weather, maintenance work or mechanical restrictions.

It is worth noting that while the capacity factor for wind farms is between 30 and 45 per cent, the capacity factor for hydro-electric plants is around 37 per cent, for gas power plants 60 per cent, coal plants 62 per cent and the historical average capacity for the UK's 'always on' nuclear fleet only works out at 62 per cent.

Wind energy has huge potential, particularly if backed by energy storage technologies such as hydrogen or tidal lagoons. It remains only for the technology to be deployed sensitively, and in partnership with local communities or businesses.



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'All scenarios represent a huge increase in deployment of renewable energy technologies from the UK's base position in 2005 of 1.5 per cent and also from our forecast of around 5 per cent by 2020 (based on current policies),' the briefing paper states.

It then posits numerous statistical devices that should be pursued in an endeavour to be allowed to offset emissions, in a way to seemingly meet the target: the key instrument being a carbon market.

The potential of clean hydrogen as a means of increasing the future viability of renewable technologies is noticeable only by its absence, although it is being promoted for London by the Mayor Ken Livingstone and is the subject of an EU declaration of intent, to which the UK is a signatory.

The raft of measures in the EWP, Chancellor Darling concluded in May – based on the unachievable 15 per cent renewable input –

'The insistence that continued economic growth is inviolable is terrifying and baffling'

will by 2020 reduce the UK's emissions by somewhere between 23 and 33 million tonnes of carbon (MtC), which is the equivalent of a 15–21 per cent cut in our annual emissions, as estimated by Defra for 2006. As the EWP is the big push in tackling climate change, the Government's 60 per cent target currently looks unachievable, let alone the Tyndall Centre for Climate Change Research forecast, which says the climate science demands a 80–95 per cent cut by 2050.

Since 2002 Jeremy Leggett, environmentalist and founding chairman of Solar Century, has been one of many industry experts advising the government on how to achieve its renewable energy obligation.

He recently wrote in the July/August *Ecologist*: 'On renewables, at the heart of the mismatch between the Government's rhetoric and the policy reality lies a stifling inability throughout Whitehall to do anything other than "think big". This theme runs through the energy white paper at every turn. There is clearly a view at the highest level of government that 'grown-ups' don't get their energy from renewable, community or micro-generated sources.'

As we show on pages 46-47, renewables can power the UK to the tune of 702 TWh (terawatt

hours) of electricity and 429 TWh of heat annually, utilising known technologies. This compares to our current usage of 406 TWh and 710 TWh respectively. Taking into account electricity needed for a sustainable transport system (151 TWh, according to the Centre for Alternative Technology) we can see that the problem is heat, which can only be addressed by an immediate and wholesale renovation of housing stock and not some future carbon market.

Yet despite this – and the fact that renewable technologies are becoming increasingly efficient and price-competitive by the day – the Government remains resolutely unimpressed and is set to drive investment towards uncertain technologies, such as CCS and nuclear fusion, and towards heat-inefficient centralisation.

To coin what is fast becoming an anodyne phrase, this is business as usual. The business as usual that Sir Nicholas Stern warned would end in climate catastrophe. As the recognised world leader on climate change, the Government's insistence that continued and sustained economic growth is inviolable is terrifying and baffling, and simply incompatible with what is known.

It's not just fossil fuels that are running out. Most major raw materials integral to modern manufacture are following a similar trajectory, on slightly varying timelines, as was detailed in May in an investigation published in *New Scientist*. In 50–100 years, it concluded, the era of cheap consumer goods will be over. Indeed, the OECD has convened a task force to look at resource depletion.

Growth cannot address the converging crises. Unless we take this single concept on board we will not be able to move forward with any sense of purpose. The business as usual approach simply mortgages the future, as we can see by looking at the EROEI of competing energy supplies and their respective carbon footprints (page 45). These are the critical considerations when assessing a viable long-term strategy to deliver energy security and mitigate against climate change. By seeing how much energy is generated by a given technology in its lifetime and then dividing this figure by all the energy used to construct, install, maintain and decommission, it is possible to calculate where best to spend our remaining supplies of fossil energy.

We can also immediately see which sources of energy build in security of supply and

Tidal Power

The potential for the use of tidal power in the UK is enormous, amounting to, at the very least, 20 per cent of our electricity needs.

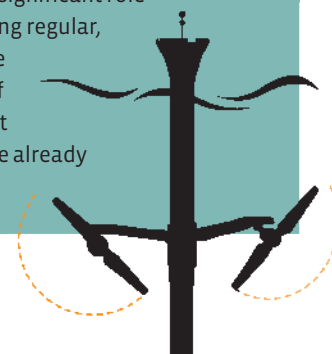
The UK's largest proposed scheme, a huge concrete barrage (similar to a dam) stretching across the Severn Estuary was recently given the nod by the Sustainable Development Commission. If built, however, it would cause extensive damage to wetland ecosystems and disrupt the tidal range further up the estuary. Studies in 1989 concluded that at least three important bird species would be driven away from the South-West as a result, fish mortality would increase, and the impact upon the 65,000 birds that winter on the estuary is uncertain.

In place of the barrage, Friends of the Earth supports the building of tidal 'lagoons' – circular impoundment structures built in sections of the estuary which trap water inside their boundaries at high tide and let it flow through turbines built into their walls at low tide to generate huge amounts of power.

The lagoons, proposed by British/US company Tidal Electric, would not only have minimal impact upon the tidal range and ecology of the estuary, but could in fact generate up to 14 TWh more power than the barrage each year.

Lagoons can also help match the availability of electricity with demand. When consumers are using less electricity than is being produced on the grid, water can be pumped up into the lagoon. This can then be released to generate energy at times of high demand.

Tidal stream technology, which uses turbines placed in fast-flowing water to generate electricity, could also play a significant role in generating regular, predictable amounts of power. Pilot projects are already underway.



Future energy

resilience to climate change, and which ones leave us exposed to random blackouts and climate catastrophe, spiralling costs, terrorism and far-reaching foreign policy demands.

The EROEI exposes government policy as falling into the latter category. Essentially, it is proposing that we burn our fossil fuels simply to meet current consumer demand, with no end game in sight.

Not only does this contradict the stated aim of tackling climate change, it compounds the evident belief that a techno-fix will emerge, which in turn undermines the drive to get consumers to be more energy-efficient. Historically, whenever there has been a technological advance in electricity generation or delivery, usage has gone up. The only times it has fallen is during a recession.

The R-word, perhaps more than anything, explains the current reluctance to go down

the renewable route. It will make us uncompetitive if we act unilaterally, the Government says, wheeling out its mantra that we are only responsible for 2 per cent of global emissions. However, if the City of London's offshore investments – from which the UK directly profits – are taken into account, as they were in the recent Christian Aid, report *Coming Clean*, the UK is actually responsible for 15 per cent of global emissions.

Today, admittedly, fossil fuels remain cheaper than most renewable sources, but in a decade that won't be the case, as the costs per unit of renewable energy are fixed – the sun always shines, the wind always blows, the tide always turns and once the technology is installed, it requires maintenance alone. Conversely, the costs of fossil fuel and uranium over the next 30 years will be inherently volatile as supplies run out. To

stand the faintest hope of controlling our destiny and preserving the lifestyle choices we enjoy today we have to end our reliance on fossil fuels. Contrary to popular myth, it is the pursuit of some kind of hybrid fossil fuel future that will return us to the cave, not the pursuit of a renewable energy future.

Undoubtedly, the switch to renewable energy will slow growth but the impact will be negligible compared to what we can expect if we crash into recession as a result of inflationary pressures arising from fuel scarcity, or suffer climate shocks of which the floods in Tewkesbury were just a foretaste. The impact of these converging crises is already emerging in the form of higher fuel prices, higher food prices and higher insurance premiums.

In July the Centre for Alternative Technology (CAT) released its report *Zero Carbon Britain*. This does what it says on the tin: it tells us, in great detail, how we can become a renewable society by 2030. In America, S. David Freeman has delivered a similar blueprint, showing how the USA can become wholly powered by renewable technologies in 30 years. How starkly these compare with the Government's approach.

As the white paper was being finalised, the Government reduced the grant-funding available for households wishing to install renewable technologies by around 75 per cent, crippling demand. It remains non-committal on feed-in tariffs to encourage micro-generation, an incentive that has driven Germany's renewable energy supply to above 20 per cent.

There is a raft of dramatic adverts exhorting us to conserve energy, and a roll-out of smart metering is on the horizon. And latterly, coming in a poor third behind climate-change sceptic Australia and California, it announced that the sale of incandescent lightbulbs would be phased out in four years. Yet there has been no similar action on white goods, even though most major manufacturers don't place their top-rated energy-efficient models on the UK market. Nor has there been any action on fuel efficiency or against the petrol engine, although plug-in technology exists and should be clearly heralded as the future.

As with refurbishing the housing stock to make it more heat and energy efficient this could be achieved with negligible tax and incentive measures.

The Tyndall Centre's assessment of the EWP

Solar Power

Every year, each square metre of the UK receives between 900 and 1200 kWh of solar radiation. Capturing just some of this energy could make a significant contribution to fulfilling our energy requirements.

Solar thermal technology, which produces hot water, has become very efficient even in northern climates. Newer versions using evacuated glass tubes are able to supply between 50 and 70 per cent of domestic hot-water needs.

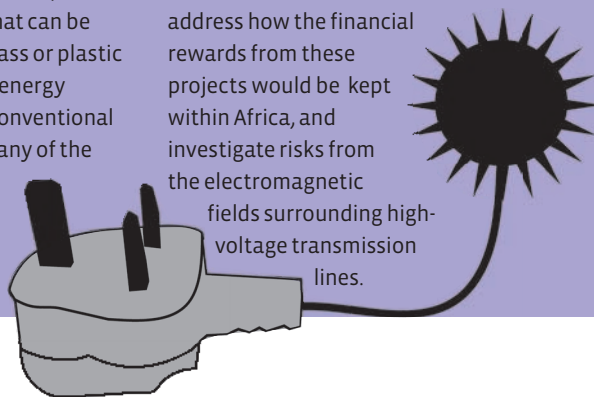
Solar photovoltaic panels, which generate electricity, are currently dogged by high cost, both financially and in terms of the heat energy used to melt the silicon in the cells. Although in most locations in the UK you will still eventually see both an energy and cash payback, neither the economics nor the thermodynamics are as attractive as those for its thermal cousin (above).

This could be set to change with the arrival of 'thin-film' photovoltaics, which use conducting chemicals that can be 'sprayed' or 'printed' onto glass or plastic backings, avoiding the high-energy processes associated with conventional manufacturing. However, many of the new thin-film technologies rely on heavy metals such as cadmium, or nano-scale particles such as titanium-

dioxide molecules or carbon nanotubes. If we are to accept the efficiency benefits brought by these technologies, we must make sure that manufacturers have stringent 'end-of-life' procedures in place to safely recycle these dangerous compounds.

Another area where the sun's energy offers huge rewards is in Concentrating Solar Power (CSP). Here, solar radiation is focused using curved or parabolic reflectors onto specially designed surfaces, usually containing molten salts. These salts are then used to boil water, driving steam turbines and producing electricity. Estimates suggest that covering an area of the Sahara desert 254 km by 254 km with CSP plants could provide power equivalent to the entire world demand for electricity. Using high-voltage DC power transmission would then allow electricity to be transmitted from North Africa to London with only a 10 per cent energy loss.

Further studies into CSP will need to address how the financial rewards from these projects would be kept within Africa, and investigate risks from the electromagnetic fields surrounding high-voltage transmission lines.



is damning and precise: 'The climate change premise of the energy white paper is admirable. By contrast, the content is not commensurate with the Government's 2°C commitment nor its claim to be providing 'international leadership' through 'the credibility and influence' of its domestic policies.

'Given the Government's acknowledgement of the seriousness of the climate change threat, the EWP only serves to reinforce the shameful political expedience of current UK policy.'

If we do act to use the world's remaining meagre reserves of fossil fuels to switch to renewable technologies over the next 23 years, the future is bright. We will still have the security of a home, that is energy-efficient, we will still be able to enjoy our electrical gadgets, we will still be able to drive.

There will be constraints on production, but productivity will become to be measured on quality (longevity) rather than quantity of units produced, to conserve resources and

'We should not be asking can we make the switch but why aren't we doing this?'

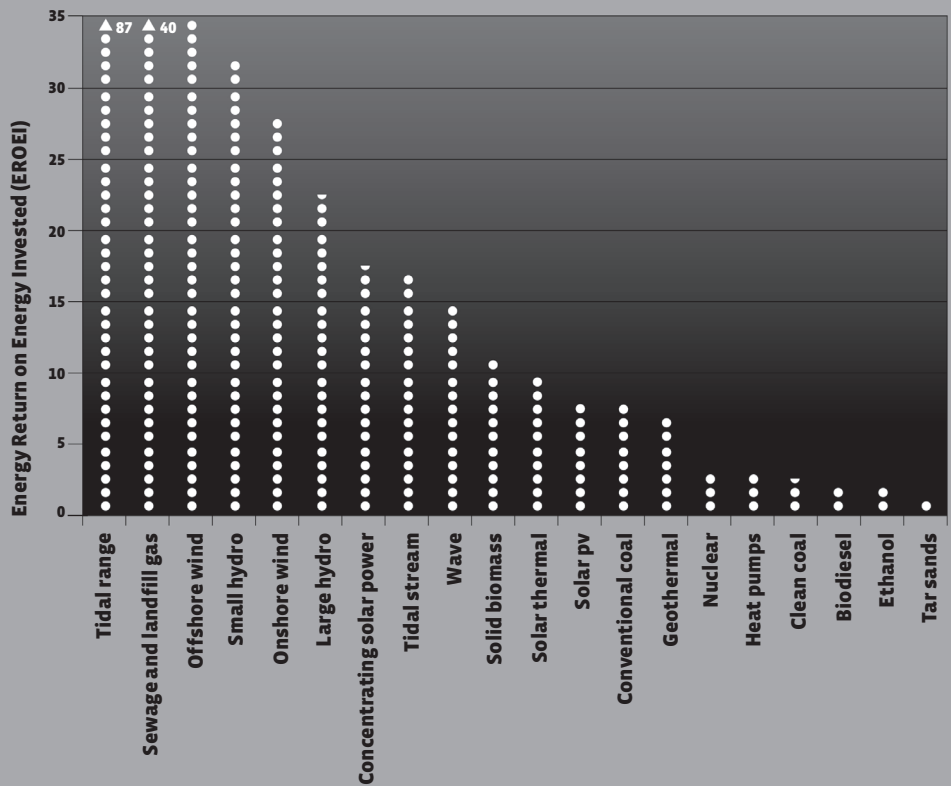
energy use. But while there are potential job losses in manufacturing there are potential job gains in the service sector. The growth potential for small and medium enterprises is immense, as would be the export potential to our knowledge economy of gaining the first-mover advantage in switching to pioneering renewable technology.

The billions of pounds we currently spend on importing fossil fuels would instead be spent within the UK. The switch over will change our working patterns and habits, as is to be expected from what is essentially the third industrial revolution. As a semi-decentralised system, it will be resilient to failure or attack and eventually supplemented by a smart grid where households become renewable generators.

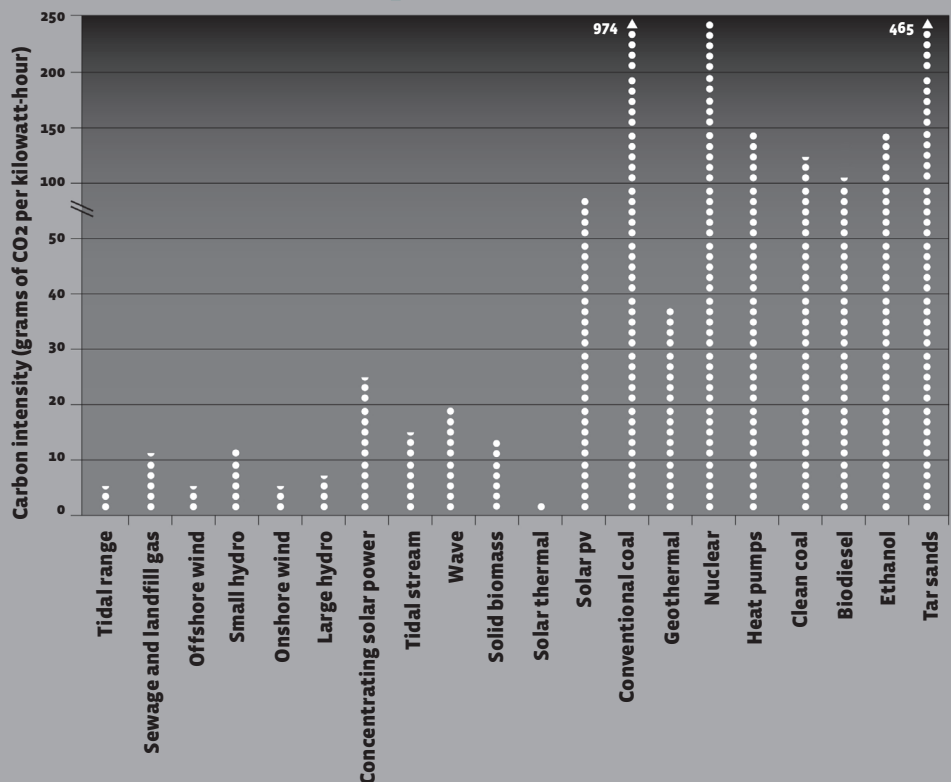
If we don't make the switch, our horizons will narrow to a degree that few of us in the developed world can begin to imagine. If we fail to embrace the future we will be left hostage to fortune.

As Colin Challen MP, chairman of the all-party committee on climate change, said at the launch of the CAT report: 'We should not be asking our politicians can we do this – we should be asking why aren't we doing this.' **E**

Energy return on energy invested



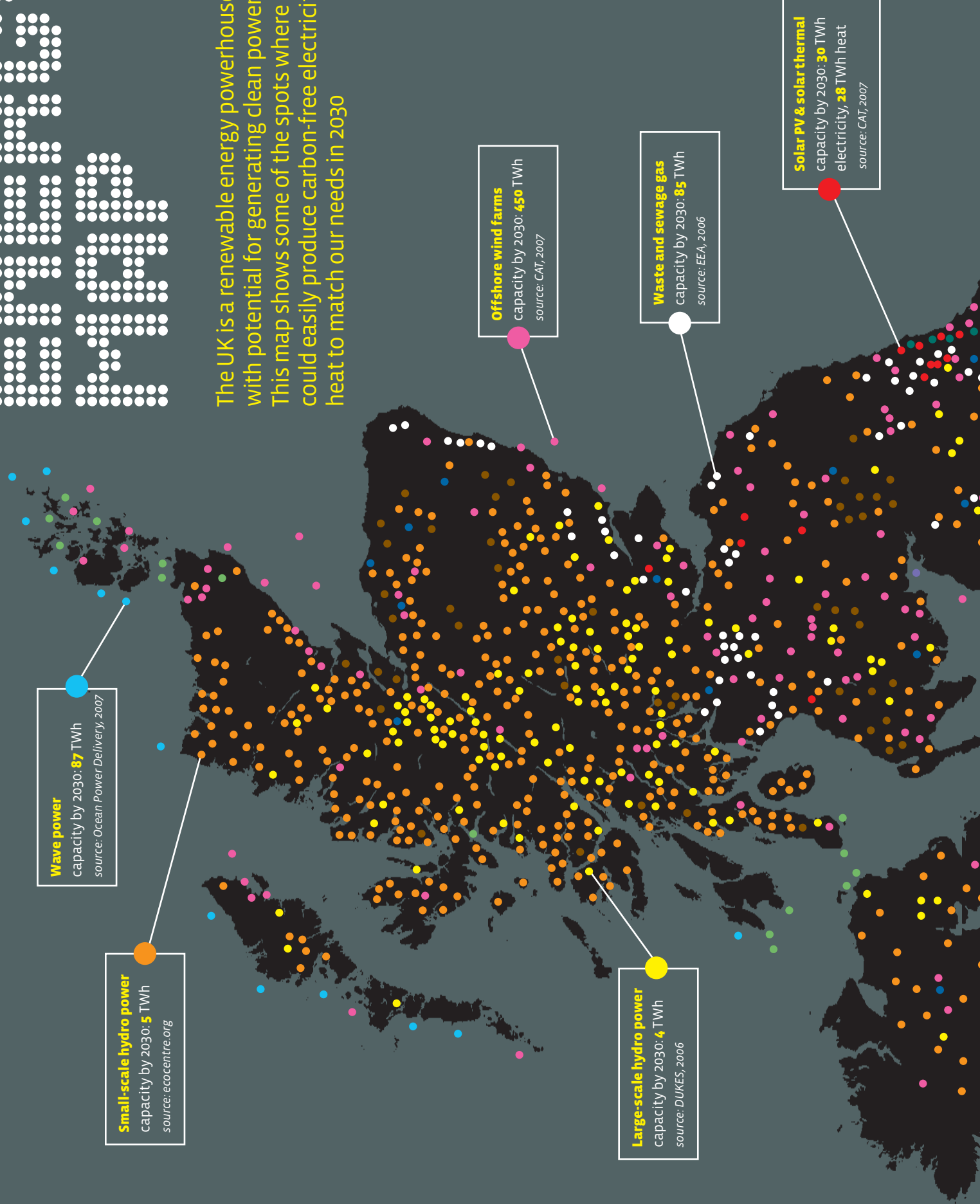
Carbon footprint



For more information on the data presented in these graphs, and for full references, go to www.theecologist.org/energy

UK 2030

The UK is a renewable energy powerhouse, filled with potential for generating clean power. This map shows some of the spots where we could easily produce carbon-free electricity and heat to match our needs in 2030



Wave power

capacity by 2030: **87** TWh

source: Ocean Power Delivery, 2007

Small-scale hydro power

capacity by 2030: **5** TWh

source: ecocentre.org

Large-scale hydro power

capacity by 2030: **4** TWh

source: DUKES, 2006

Offshore wind farms

capacity by 2030: **450** TWh

source: CAT, 2007

Waste and sewage gas

capacity by 2030: **85** TWh

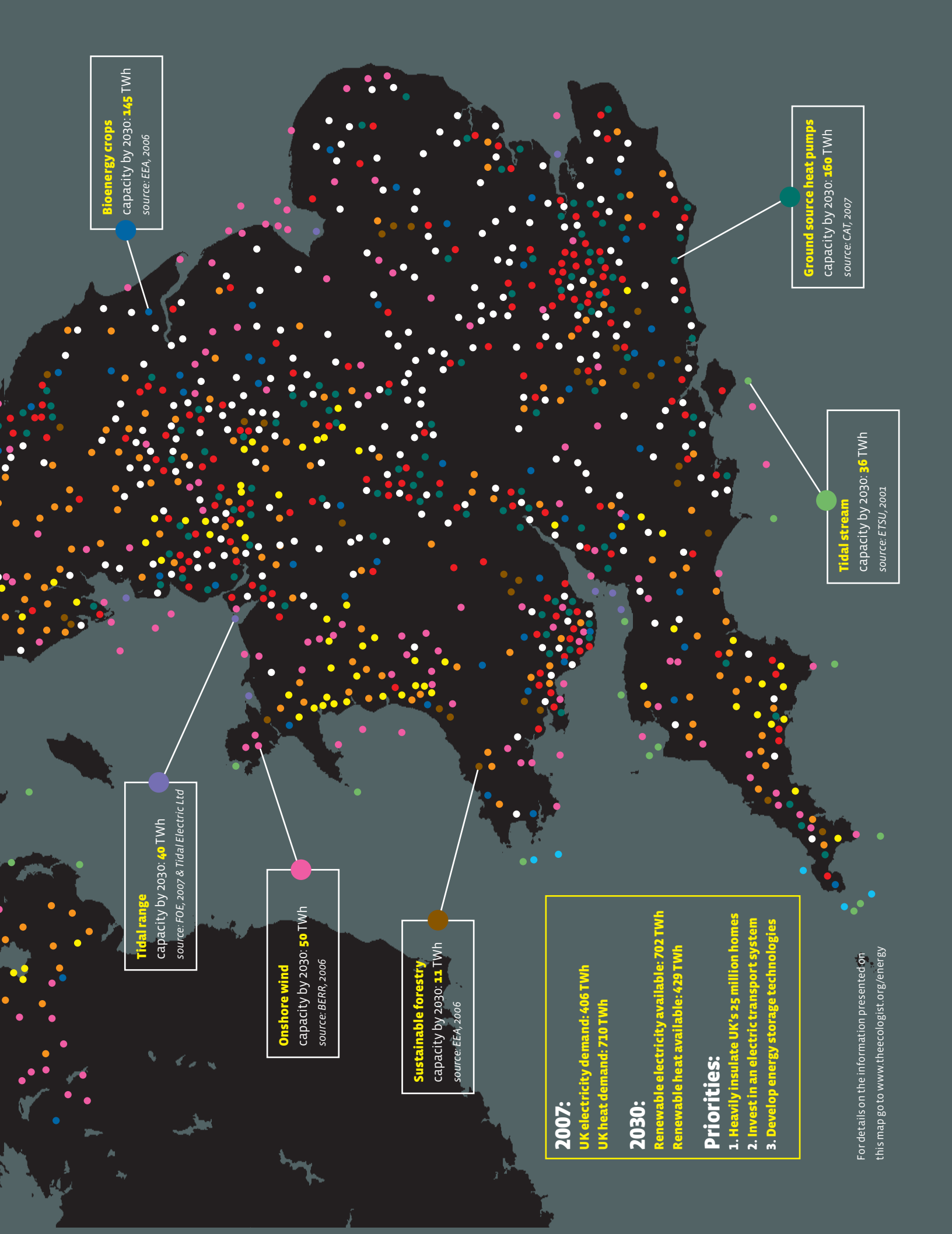
source: EEA, 2006

Solar PV & solar thermal

capacity by 2030: **30** TWh

electricity, **28** TWh heat

source: CAT, 2007



Bioenergy crops
capacity by 2030: **145** TWh
source: EEA, 2006

Ground source heat pumps
capacity by 2030: **160** TWh
source: CAT, 2007

Tidal stream
capacity by 2030: **36** TWh
source: ETSU, 2001

Tidal range
capacity by 2030: **40** TWh
source: FOE, 2007 & Tidal Electric Ltd

Onshore wind
capacity by 2030: **50** TWh
source: BERR, 2006

Sustainable forestry
capacity by 2030: **11** TWh
source: EEA, 2006

2007:
UK electricity demand: 406 TWh
UK heat demand: 710 TWh

2030:
Renewable electricity available: 702 TWh
Renewable heat available: 429 TWh

Priorities:

1. Heavily insulate UK's 25 million homes
2. Invest in an electric transport system
3. Develop energy storage technologies

For details on the information presented on this map go to www.theecologist.org/energy

Shifting gear

Are you living the dream? Or walking zombie-like through the nightmare of modern consumerism? **Laura Sevier** explores the sanity of downshifting

What does quality of life mean to you? Is it the stuff you buy, keeping up with the Joneses? Or is fresh, clean air, the company you keep, and a less stressful living environment more important?

For Jo Hampson, a former Thames Valley Police Chief Superintendent, it meant dropping 85 per cent of her salary, giving up her job and buying a small business smoking food and making chocolates in Cumbria. After a few years' service in the police force she had been catapulted to the top of her profession: 'It was a fab job and very well paid – I had a huge budget and 500 staff from five police stations.' The problem was, it was taking over her life.

She'd leave the house at 7am and get back after 9pm. There was no time for friends or family or to spend the money she was earning. Before taking a holiday she would have to work until midnight for days ahead, in order to prepare, and when she got back it took three weeks to clear her in-tray. 'I swore I'd never have another holiday again,' says Jo. 'Life is for living and I was not really living it.'

Now her quality of life in Cumbria is, she says, 'Fantastic. I'm less stressed; I live in the most amazing converted barn, high on the Fells. Every day I walk across the fields, whatever the weather, and think how lucky I am.' After three years running the Smokehouse and increasing its turnover by 300 per cent, she and her partner sold the business and set up Stepping Off, a consultancy that helps other people to downshift.

Portrait of a downshifter

Downshifting in its most extreme form is often associated with people who reject the rat race entirely and head for the country, perhaps to tend pigs and chickens and aim for greater self-sufficiency. But the term covers a far wider spectrum. Put simply, it's about living more simply, slowing down; about making life less

frantic and fraught. It values time over money and possessions – which usually means freely trading part of your income for more time and reducing the amount of stuff you buy. It's about taking control of your life and seeking more of a work/life balance. Which means different things to different people.

Most people who go on Jo's Stepping Off course – everyone from high-flying salesmen and people facing redundancy to local women wanting to start up their own businesses – want to do something for themselves, to stop commuting and working for other people. Often she meets people who are worn down by cut-throat, competitive, corporate culture, who are fed up with having to compromise their values. But the biggest motivating factor is

'It's about living more simply, slowing down; about making life less frantic and fraught. It values time over money and possessions'

time. 'Time is the Holy Grail,' says Jo. 'It's what everybody wants. Time for leisure, for themselves, to enjoy life more. Few people I come across take all their holiday time. And they want to be more free with their time. When I was running the Smokehouse I was working seven days a week, but as it was my business I could take the afternoon off to go fishing and then work later one evening.'

Far from finding an easy way out, downshifters often have to become more entrepreneurial than ever before. According to Tracey Smith, who founded National Downshifting Week in 2005, 'The success stories I hear about are people who have researched how to earn a living beforehand. I know of many people who have moved to France and then, when they've got

there, had a crisis because their funds became depleted – so they have to move back.'

Which is why she positively discourages people from moving unless they have really thought it out. 'Anyone can downshift, but my line is: dip your toes into simple living; try it gently within your own four walls first.'

Buying less stuff is central to the ethos – but, rather than feeling deprived, 'You've got to embrace living with less. Instead of thinking "I can't afford it" and being miserable, you just think "I don't need it",' says Tracey. 'There are different ways of gaining – you can exchange, borrow or swap. I use things to the end. All our stuff is so old, but it all works. It's not the latest colours but I've got more money in my pocket.'

Slow down and green up

It's this 'living with less', Reduce, Reuse, Recycle ethos that makes downshifting a kindred spirit of the green movement – a central demand of environmentalism being that we should consume less. Likewise its 'slow down a gear' element allies it with the Slow Movement. Tracey Smith's motto for National Downshifting Week is 'Slow Down and Green Up'. She believes that the two are inextricably linked.

'Slowing down – people don't realise how green it is. By slowing down a gear you're racing around less, you live with less and are more resourceful.' The Downshifting Week Manifesto includes easy, simple actions, such as 'Reclaim an hour of time this week', and 'Buy local'. So downshifting can be gradual, action by action, gear by gear, rather than a dramatic change from fifth (fast lane treadmill) to first gear (smallholding with chickens) all at once. 'You just have to find your comfort level – which may be just



‘Downshifting can make you happier, improve your quality of life, get you more involved in your community and help the environment’

Downshifting

one or two gears slower,' she says.

One person who was greatly inspired by Tracey's ideas and can testify to this gradual shift is Natalie Yeates, who calls herself a 'bog-standard, Jo Bloggs downshifter'.

Fifteen years ago, Natalie was living in the middle of Guildford. 'I would open the door in the morning and all I could smell was car fumes,' she recalls. She had a 'mad office job plus a mortgage', but when she and her husband split up, she and her children moved to Wiltshire, where she now lives in a small social housing estate in the countryside.

'It's very lovely and agricultural. We are living our dream. Here the only thing you might wake up to is the sound of birds or tractors.' She met Tracey a few years ago and has been making one small change at a time ever since, writing a blog to chart her downshifting progress and give advice (see www.greeningup.blogspot.com).

Natalie now works from home making eco wedding stationery – which means she has more time for her children (as I speak to her she's cooking them a hearty organic meal). 'We

eat less meat now, but better meat, and we buy from the village shop where I volunteer one day a week.' To get there she only has to walk through a field and down a little lane. 'There's more community spirit here. The neighbours are happy to help – and everybody says hello!'

So downshifting can make you happier, improve your quality of life, get you more involved in your community and help the environment. And this happiness – gasp! – has nothing to do with spending lots of money.

To hell with this

As a result, in a mass consumerist society the downshifting value system is highly subversive. It rejects the idea that to be happy you need to acquire, accumulate and desire products, be they anti-ageing creams, 'must-have' handbags or a second home abroad. So much in our society seems geared towards getting us to do more, cram more into our already cramped and busy lives, and to buy more – in spite of credit card debt trebling between 1996 and 2003. And often, this means buying things we don't really need.

For example, research by Churchill Home Insurance showed that 86 per cent of women have gone out and bought clothes that have remained on the hanger ever since. At an average of 14 items each, this amounts to £305 worth of clothes per year and a whopping £12,810 worth of unworn clothes over the average working life.

So downshifting, with its 'consume less' ethos, is a rebellion against the 'norm' that we should always want more – and thus have to earn more, work longer hours, keep climbing the ladder (or remain stuck on the treadmill), regardless of the impact it may have on our relationships and health. It's an attitude that says: 'To hell with this! I don't need it any more.'

In this way, downshifting is an antidote to the 'affluenza' that afflicts our society, a concept described as 'a painful, contagious, socially transmitted condition of overload, debt, anxiety and waste resulting from the dogged pursuit of more'. It's a concept explored in detail in the 2001 anti-consumerist book *Affluenza: The All-Consuming Epidemic*, written by John de Graaf, environmental scientist

Creative ways to downshift

Organise your finances

This is an essential practicality. You need to budget and to ask: 'How much do I need in order to live my life?' Work out what you need and how you'll find it. This needn't always mean work – for instance, could you rent out a room? Stop spending money that you don't have – a symbolic and effective gesture is to cut up a credit card. Distinguish between what you need and what you want, then see if you can go without some of the 'wants'. The money you can save might be a real wake-up call.

You don't have to relocate

The majority of downshifters stay put and manage to change their lives successfully without moving house. If you live in a friendly neighbourhood then it's simply a question of having the time and energy to tap into it, providing, of course, there are suitable employment options available to you. If you do want to move to the country, you don't have to sell up immediately – why not rent out your house or flat for 18 months and test the water? See what life is like in deepest,

darkest Scotland in the middle of winter... then decide if it's for you.

Work smarter

Cut out the commute by working from home if you can. The internet has revolutionised the way we can work, so this has increasingly become an option. Are there other ways you could earn money that could be done from home that could supplement your income? What about selling home-grown produce or hand-made goods, or even selling things on eBay?

De-junk

Get rid of all the stuff that's clogging up your cupboards or floor space. The more you have the more there is to clean and keep tidy. If it's not useful to you, it may be to someone else. Investigate the Freecycle network (www.freecycle.org).

Food matters

Start growing your own, either in pots or in an allotment or on a smallholding (see www.gardenorganic.org.uk). Buy local and cook simple meals made using fresh, seasonal, preferably organic ingredients

(see www.farmersmarkets.net – and search the Organic Directory on www.whyorganic.org). If you have the space, consider keeping chickens for a fresh supply of delicious free-range eggs. If you have – or can start – a compost heap for food waste you'll find yourself with a pile of 'black gold' compost for next year's planting.

Assess your skills

Do you have skills or services that you could barter, such as massage, gardening, cooking or childcare? LETS (Local Exchange Trading System) is a system of local community-based mutual aid networks that barter goods and services with each other (see www.letslinkuk.net).

A revolution in the head

What goes on in your head when you decide to downshift is important. You're not only giving up the job, but making a fundamental shift in your worldview. If having a BMW sports car, exotic holidays abroad and an upgrade on your mobile every six months is important to you, you aren't ready to make the switch.

David Wann and economist Thomas H Naylor (Berrett-Koehler, £10.99).

Victor Lebow, a prominent American retailing analyst of the postwar era, summed up the credo of mass consumption thus: 'We need things consumed, burned up, worn out, replaced, discarded at an ever-increasing rate.' In a world of dwindling resources, climate change and increasing population, this is madness. Cultural historian Thomas Berry even considers the dynamism of our consumer society (i.e. of unlimited economic growth) 'the supreme pathology of all history.'

A rational response

But downshifting is even more than a rebellion against the frantic consumerist lifestyle. It is a rational and constructive way to regain control of your life, in a positive way.

Downshifters are aware that there's more to life than being trapped in the frenzy of consumer culture. And by going against this, people who voluntarily live simpler lives – as

'We have a doozie of an environmental pressure: climate change. If we are to survive, we must evolve culturally'

opposed to those living in poverty who have no choice – are modern heroes. Because they consume less, are less wasteful and tend to be more sensitive to the wider environment, their way of living could be a signpost to the future. After all, if everyone in the world lived in the way most people do in the UK, we would need three planets to sustain us.

One reason why downshifting is not widely seen as a form of modern heroism is the way in which it's depicted in the popular media, which exists to sell us stuff, and lives or dies by the amount of advertising it carries. For this reason, downshifting is usually presented as just another lifestyle choice, with plenty of things you can purchase to make it happen. Either it's '10 things you can buy to downshift your life' – when buying is clearly not the answer – or a romanticised 'Buy your dream rural property in France'; or it's portrayed as a rather off-putting 'It's not easy being green'.

Yet, with increasing numbers of people downshifting, it's a movement to be taken seriously. Far from being a minority interest,

downshifting is happening all around us. In 2002, according to market research analysts Datamonitor, there were an estimated 12 million downshifters across Europe. Research published in 2003 by the Australia Institute suggests that in the UK, 20 to 35 per cent of adults between the ages of 30 and 59 have downshifted, the average income having fallen by 40 per cent. And they're not all wealthy or middle-aged, but spread right across all age groups and social strata.

Happening all around

In the USA, where it's also known as 'voluntary simplicity' or 'simple living', downshifting was already well established by the time it filtered into Europe in the mid-1990s. Now between one in 20 and one in four Americans are believed to have opted for simpler, more balanced lifestyles, though the exact scale remains unclear.

More recently, it's caught on in Australia. The survey by the Australia Institute found that nearly a quarter of 30- to 59-year-olds there were downshifting too and, again, that the trend cut across income groups, and was not confined to highly-paid professionals and business people.

Whether driven by work overload, redundancy, illness or by a conscious decision to adopt a more eco-friendly lifestyle, the seeds of a new movement are spreading on a mass scale – witness the growth of farmers' markets, local brands, slow food and real ale.

'Green consciousness' has never been higher. A recent Mintel report shows that one in four people are 'keen to be green' and very conscious of and conscientious about green issues. Almost six in 10 adults are willing to make changes if they can be sure it will make a real difference, that companies are doing their bit, that local authorities are dealing with issues effectively and that other countries are taking the issues seriously.

On a community level, witness the evolving Transition Towns network – a community-led initiative aimed at reducing energy and resource use (see page 58). Approximately 14 towns and cities are now signed up to the initiative.

Our evolution

Downshifting still has a long way to go before it's truly part of the mainstream, but there are those who believe that if we are to survive and thrive as a species, it could even be part of our evolution – that it is part of our shift from



Homo sapiens to 'Homo sustainabilis'. An article in the AXIS Performance Advisors' newsletter in 2006 points out: 'We know from Charles Darwin and the scientists who followed him that environmental pressures can precipitate an evolutionary shift. Right now we have a doozie of an environmental pressure: climate change... If we are to survive, we must evolve culturally.'

So downshifting can be seen as evidence that human culture is evolving in a sustainable direction. Downshifters are people who are quietly redefining 'success' on their own terms, and who, realising that 'enough is enough', have rethought things from scratch. They are now carving out a simpler way of living that treads more lightly on an increasingly fragile earth. **E**

Resources

Downshifting Week

www.downshiftingweek.com

Stepping Off

www.stepsoff.co.uk

Self Sufficient-ish

www.selfsufficientish.com

CAT

www.cat.org.uk

Recycle-More

www.recycle-more.co.uk

Useful books

Downshifting: The Bestselling Guide to Happier, Simpler Living

Polly Ghazi and Judy Jones (Hodder & Stoughton, £10.99)

In Praise of Slow

Carl Honoré (Orion, £7.99)

The Penny Pinchers' Book Revisited: Living Better for Less

John and Irma Mustoe (Souvenir Press, £7.99)

Voluntary Simplicity: Toward a Way of Life that is Outwardly Simple, Inwardly Rich

Duane Elgin (William Morrow, \$12.95)



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GREEN PAGES

PLASTIC PARTY SYNDROME

How to green
children's parties

ECO PAINTS

Redecorating without
the headaches

FOOD FOR FREE

How and where
to forage for it

MEET ROB HOPKINS

Smart living in the 21st century

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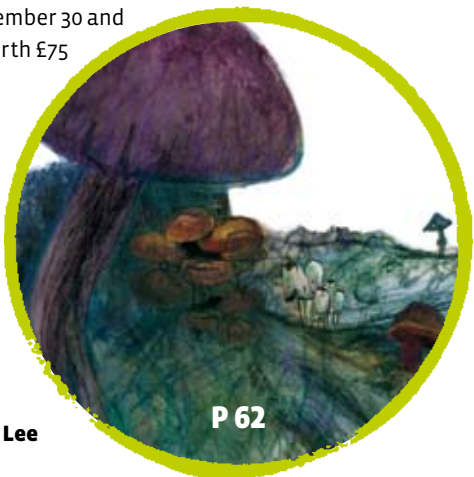
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64 Eco clothing: Patagonia **Matilda Lee** speaks to Patagonia’s Yvon Chouinard about fashion, paying an earth tax and how buying clothes – even organic ones – won’t save the world

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69 Plastic Party Syndrome **Hina Patel** was tired of binning the endless array of plastic party gifts in her daughters’ goodie bags. So she created an alternative to plastic in a green goodie bag

70 Eco Paints They don’t smell, come in hundreds of colours and are better for your health. **Matilda Lee** adds up the benefits of environmentally friendly paint



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Wherever you see this little bird it’ll point you to relevant contacts in our Green Shopping Guide

Strength in numbers. In terms of fending off depressing thoughts that, as individuals, the issues we face are ‘out of our hands’, binding together is key. This month we meet Rob Hopkins, who’s sparked off a countrywide effort across cities, towns and villages to rebuild communities. With threats of peak oil and climate change, creating a ‘transition culture’ to greater self-sufficiency and lower energy needs means local people can come together and take more control of their lives, and their futures.



Our In Season pages include a round up of ethical street markets and green fairs to enable you to avoid the high-street scrum this holiday season and enjoy a community vibe. Lest we forget the impact individuals can make. Eco businessman Yvon Chouinard, founder of Patagonia, through his ‘earth tax’ has inspired a new wave of eco businesses open to the idea of giving something back. And mum Hina Patel got fed up with plastic at children’s parties, so toyed with the idea of green goodie bags – and now it’s a business.

This month’s Green Pages also include a reader survey for us to gauge your thoughts on how we are doing. Please fill it out and return it – your feedback is vital.

Matilda Lee, Green Pages Editor

★ **READER OFFERS** ★

- 74** 10% off the first monthly meat box from Clare’s Organics
- 76** 12% off low-energy light bulbs from Powertech
- 80** 15% off all accessories from Green Shoes
- 82** Up to £5 off bodycare products from Aubrey Organics

email: greenpages@theecologist.org

November

BY LAURA SEVIER

Home energy: top tips

Energy-saving expert George Marshall's advice:

- 1 Insulation of 50 cm+ and up to a metre in the loft
 - 2 Secondary glazing saves more heat than double-glazing
 - 3 The big carbon savings are from heating, so invest heavily in draught-proofing and an efficient boiler
- Visit www.theyellowhouse.org.uk for more tips.



25 November

Vintage fashion fair

An Aladdin's cave of 65 stands, rich in colours, textures and variety – from vintage buttons, braids and trimmings to 18th-century costume to high fashion from the 1930s to the 1960s. Crammed with rare, time-travelled treasures such as vintage Biba, Vivienne Westwood, Zandra Rhodes, Yves Saint-Laurent and Chanel, this is the place to find a vintage one-off wonder piece.

Battersea Arts Centre, Lavender Hill, London
www.vintagefashionfairs.com

In hibernation

Toads are now in hibernation, finding logs or stones to hide beneath, as are frogs which seek out the bottom of a pond, or some other sheltered place.

Hedgehogs and dormice go for full hibernation

but most other mammals, such as badgers, merely reduce winter activity and fatten themselves up for the lean months ahead.



Beyond christmas shopping

There's more to Christmas than a last minute, desperate dash to the high street. At ethical street markets and green fairs you can buy, swap and donate things; get involved in workshops and debates about greener living; or just soak up the community vibe and drink fair-trade cappuccinos and organic mulled wine...

thebiggreenmarket

Big Green Market

A series of ethical street markets planned for the

run up to Christmas with products ranging from vintage fabric purses to organic vegetables. More than just a market, there are recycling collection points for old shoes, mobile phones and bras (200,000 bras guarantees £10,000 for the Yorkshire Air Ambulance.) Plus, in York there's a 'Nappuccino' session (Real Nappy advice plus free cappuccino) and composting advice from the York Rotters.

Throughout eight different UK cities.

www.biggreenmarket.co.uk

Sustainable Solutions Festival

Featuring a clothing swap-shop, a green marketplace and advice on greening your lifestyle, the festival will be rife with debates, discussions and demonstrations on local food, Fair Trade, healthy-living, the 'Plastic-bag-free Porthcawl' campaign, greening your home or workplace, climate change and energy efficiency.

Bridgend Recreation Centre, Bridgend (2-3 Nov)

www.sustainablewales.org

Eco Christmas Design Fair

Handmade egg cosies and yellow cushions made from reclaimed woollens and recycled fabric Christmas decorations are just some of the eco-delights on offer at the fair, which has everything from eco-friendly footwear to solar-powered toys and FSC-certified furniture. There's organic mulled wine and mince pies, a Fairtrade and organic café, live acoustic music and a 'Recycled Christmas Decoration' workshop.

Camden, London (23-24 Nov)

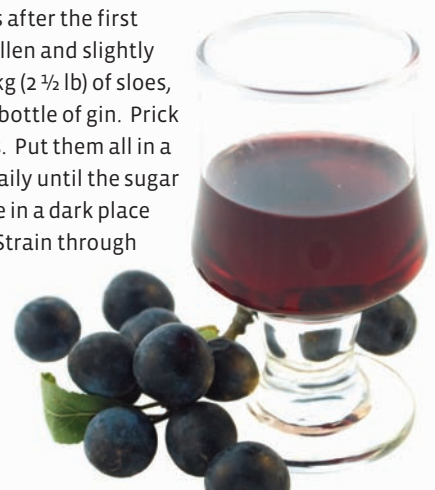
www.ecodesignfair.co.uk



Take it sloe

Sloes, the fruit of the spiky blackthorn bush, bring a gorgeous flavour and colour to vodka or gin. Tradition has it that the best time to pick sloes (which grow wild along hedgerows) is after the first frost of autumn has swollen and slightly softened them. Take 1.1kg (2 ½ lb) of sloes, 450g (1lb) of sugar and a bottle of gin. Prick each berry several times. Put them all in a big, sealable jar, shake daily until the sugar has dissolved, then leave in a dark place for three to six months. Strain through muslin and decant into sterilised bottles.

Zayda Kebede



Alternative ethical gift ideas

Present Aid

Newborn deaths in developing countries such as Burkina Faso are nine times higher than those in the UK. Be a life-saver for just £15 by purchasing a simple midwifery kit, one of 43 gifts available from Christian Aid's 'Present Aid virtual gift list'. Gifts range from £60 for a herd of goats to £45 for a community tap. www.presentaid.org

Buy Nothing

Buy Nothing Day on 24 November is now celebrated in 40 countries. Designed to highlight the extremes of consumerism, its mission is to prevent pointless purchases – or buying things that we don't really need. www.buynothingday.co.uk



In season

GREEN PAGES

Seasonal food

Vegetables

Asian greens
Beetroot
Broccoli
Brussel sprouts
Cabbage
Carrots
Cauliflower
Celeriac
Celery
Chard
Endive
Garlic
Jerusalem artichoke
Kale
Kohlrabi
Leeks
Lettuce
Mushrooms
Onions
Parsnips
Potatoes
Pumpkins
Radishes
Shallots
Sorrel
Spinach
Spring onions
Squash
Swede
Swiss chard
Turnips
Winter squash

Endive is slightly bitter, tender and crunchy and packed with nutrients. Great in salads.

Fruit

Apples
Currants
Medlars
Pears
Quince
Sloes

Kohlrabi is perfect for bulking up stews, soups or casseroles.

Pick of the month

Roskill's organic clotted cream fudge

Made in the kitchen of a Cornish organic farm, this is fudge of fudges. The secret ingredient is the farm's Jersey cows' milk. Free to graze on lush meadow grass, the cows produce the creamiest of milk, from which clotted cream is made in the kitchen. Tasting is believing. www.roskillys.co.uk



The pear necessity

Ever heard of the Bloody Bastard or the Clipper Dick? Both happen to be varieties of British pear grown in Gloucestershire – although how they got their names is more of a mystery. Pears grow well in Britain and we have 550 varieties to show for it, as listed by the National Fruit Collection. In spite of this dazzling array of choice, 90 per cent of the pears sold in the UK are just 3 varieties – and, even worse, supermarkets import up to 75 per cent of apples and pears. There's only one thing for it: pick a British pear from a local grower or retailer, farmers' markets or even your own tree.

Easy pear recipes

Pears pair notoriously well with cheese, or they make a warming dessert when gently stewed them with red wine and cinnamon. Just top with cream. Or, add chopped chocolate to a pan of double cream, heat gently and stir to make a smooth sauce to pour all over the pear.

21 Nov – 2 Dec

National tree week

The Tree Council's nationwide celebration of trees and woods to mark the start of the tree planting season. Across the country there will be lots of opportunities to plant trees, or to take part in woodcrafts, walks, talks, songs, story-telling and tree dressing. Visit www.treecouncil.org.uk/projects/ntw.htm

Autumn spectacles

Oaks put on their best autumn show of colour in November, so find a wild spot and relish the last of the autumnal sights. The BBC's Autumn Watch website can link you up with walks, national parks and woodlands near you. Visit www.bbc.co.uk/nature/animals/wildbritain/autumnwatch and click on 'Your Autumn'.

Where can you see the oldest oaks?

Oak trees are part of our national heritage. In Britain they can live for over a 1,000 years, reaching 40 metres high and producing stems up to 12.5m in girth. The Woodland Trust's Ancient Tree Forum has a regional list of sites you can visit: www.woodland-trust.org.uk/ancient-tree-forum/



Email: laura@theecologist.org with upcoming events for In Season



LOCAL HERO

Rob Hopkins

Transition Town Totnes

From creating its own currency to relearning lost arts, how one man is helping a community respond to the threat of peak oil. By **Ed Hamer**

Totnes is a town rapidly rebranding itself. Renowned as the alternative capital of Britain's greenest county, Devon, the town's name traditionally conjures images of crystal-healing, new-age culture, beards and sandals. It may come as a surprise then, that this dreamy pastoral backwater is the location for what has been dubbed 'the most significant and potentially ground-breaking social experiment of our time'.

Transition Town Totnes, as it has more recently become known, is the first initiative of its kind in the UK attempting to reduce the carbon footprint of an entire community in a way that is imaginative, fun and engaging. Over the next 12 to 18 months, the project will develop a community-led Energy Descent Action Plan setting out an achievable timetable for reducing the town's dependency on fossil fuels.

On first impressions you may be forgiven for thinking that Transition Town Totnes is an idealistic proposal reminiscent of the utopian 1960s counter-culture. You may also believe that our inevitable transition to an oil-free society cannot possibly be cultivated at community level, but instead must be led by industry or government. If this is the case, you will certainly not have attended one of the many talks given across the UK in the past year by the man behind transition culture, Rob Hopkins.

Rob is not your average Bohemian Totnesian. He is also disarmingly humble, considering what he's

achieved since moving here just two years ago. We meet on a drizzly Devonshire afternoon in the Field Kitchen of Riverford organic farm, a handful of miles to the west of the town. Rob grins broadly as we sit down with a glass of local Luscombe ginger beer.

'We came here a few weeks ago for my wedding reception,' he says, 'We held the ceremony at a youth hostel near Totnes, which we all got to by going up the river on a boat.' Eccentric, perhaps; you get the impression, however, that Rob is the kind of chap who simply lives what he breathes; low-impact living.

Rob's conviction is rooted in the idea that 'a town simply using much less energy and resources than at present could, if properly planned for and designed, be a more resilient, more abundant and more pleasurable place to live'. His passion is inspired by a pioneering approach that has applied the principles of permaculture design to the inevitability of peak oil.

The term 'permaculture' was developed by Australian ecologists Bill Mollison and David Holmgren in the 1970s, to describe the practice of observing natural ecosystems to identify remedies to man-made problems. Originally applied to agricultural systems (permanent agriculture) the concept was soon adapted to energy efficiency, building design and resource sustainability.

Rob's first introduction to permaculture came while travelling in India in the early 1990s. On returning to the UK he enrolled on a two-week



I was blown away by the realisation that permaculture provides us with a toolkit for earth repair

Left: Rob at Colour Works, where the Totnes Pound is printed

Below: View of the original Transition Town: Totnes

permaculture design course after seeing Bill

Mollison give a talk in Stroud:

'I remember being blown away by the realisation that permaculture actually provides us with a toolkit for earth repair. The course and the talk had a big influence on my degree in urban planning at Bristol and has inspired my work ever since.'

Following his graduation, Rob moved with his young family to Ireland where he began teaching permaculture and pioneered the practical sustainability course at Kinsale further education college. The course quickly evolved to become the first two-year full-time permaculture course in the world. It was while teaching at the college in Kinsale that Rob and his students were introduced to the uncomfortable realities of a peak oil crisis.

'The Transition Towns initiative was motivated by my initial sense of shock after first watching the DVD *The End of Suburbia* and a lecture at the college by Colin Campbell, who wrote *The Coming Oil Crisis*,' says Rob. 'We were amazed to discover that no one anywhere had really been thinking about it that much. Being a permaculture course, our immediate response was, "Right then, what shall we do about it?"'

Together with his students on the course, Rob set about applying the permaculture principles of energy efficiency, resource substitution and redesign on a scale never attempted before. They set out to construct a Kinsale Energy Descent Action Plan detailing the practical steps required





to wean Kinsale from its dependency on fossil fuels.

'The Kinsale plan was really a prototype. It wasn't until after we had published it that the consequences of what we had created began to sink in. People from all over the world were contacting us saying, "This is incredible." I think it shocked a lot of people into realising how desperately unprepared we are to face the challenges ahead'.

Over this period Rob also took personal steps to reduce his own ecological footprint by designing and building his family home. With the help of volunteers, using entirely renewable and locally sourced materials, he constructed the first new-build cob house in Ireland for more than 100 years.

The project was followed by thousands of people via an online photo-blog and hailed for demonstrating that affordable rural housing could be provided with minimal building miles. Tragically however, the house was deliberately destroyed by fire just three months before it was completed.

Such a traumatic incident obviously influenced Rob's decision to leave Ireland. However, the wave of community support that followed the fire took him and his family by surprise and inspired a new beginning for the seeds of transition culture.

In choosing Totnes as the new home for energy descent, Rob recognised the potential offered by town's unique blend of progressive and alternative culture. 'What we were looking at developing here in Totnes was a much more thorough and deeper version of what we



In the past 12 months, 20 new transition initiatives have sprung up across the UK

piloted in Kinsale. Totnes also differs from Kinsale in that the community has been involved throughout the process from the very beginning.'

In line with his unique permaculture approach, Rob spent his first year in the town simply observing and raising awareness within the community through a series of film screenings and discussions. 'We were fully aware that we couldn't simply tell someone to watch *The End of Suburbia* at home, by themselves, and expect them to suddenly start growing carrots the next day,' he laughs.

In September 2006 the project was finally launched. There followed a series of events where the community was invited to volunteer their skills and enthusiasm. Within six months working groups had been established to focus on the primary aspects of Transition Culture; from energy and healthcare to economics and the arts.

'Unlocking the collective genius of the community' is how Rob sees the early stages of transition. 'One of the first things we did was to consult the town's older generations, to ask for their experience and advice on how the town used to function with minimal oil dependency,' he says. 'It is important to remember that this concept is not new. As recently as the Second World War, Totnes was almost entirely self-sufficient out of pure necessity'.

As the individual working groups gained momentum, the town began to attract enquiries from communities across the globe wanting to initiate the transition process in their own villages, towns and cities. 'We didn't have a template

for what we were doing in Totnes' recalls Rob, 'so when people started asking us how to actually start the process, we had to sit down and think about what we had done.'

The 12 Steps to Transition was born as a result, and has since been adopted as a blueprint for transition culture. 'They are really not prescriptive but instead intended as a rough guide. People seem to find them useful as a starting point,' says Rob.

Undoubtedly the single most ambitious venture to date has been the launch of the town's independent currency earlier this year. The Totnes Pound was launched in March to emphasise the importance of re-localisation and to encourage people to attribute a value to the local economy. Following a trial period where 300 notes were distributed into circulation, 10,000 one pound notes have now been printed and are accepted by more than seventy businesses throughout the town.

'The Totnes Pound has really grasped the imagination of the community,' says Rob with boundless enthusiasm, 'I think it is essential that projects such as this have solid manifestations that people can relate to. It provokes discussion but also sets the framework for a post-industrial society in which local currencies are inevitable.'

Rob is currently working on a book for publication in the spring entitled *Small is Inevitable*. Designed as a comprehensive template to the transition phenomenon, Rob uses the book to explore what he calls the 'the head, the heart and the hands of energy descent'.

In an engaging and accessible

Above left: 10,000 Totnes Pound notes have been printed and are accepted by 70 businesses

Above right: Rob and his friends building a cob house

Opposite: Rob in flow at Riverford organic farm

Photography ROSALIE PORTMAN

manner, Rob describes 'the head' as the concepts of peak oil, outlining the arguments for and against localisation and historical examples from a pre-oil-dependent society. 'The heart' refers to the enthusiasm and motivation that already exists within communities and how this can be focused to facilitate change. 'The hands' are what Rob refers to as 'the great reskilling', the practical steps that communities must take to become self-sufficient in food, energy and materials.

'What the book is really saying is that this change from the grassroots is happening whether you accept it or not, this isn't a process which comes along with all the answers, it is a process which is about getting people thinking about the right questions'.

Rob's work has attracted personal commendations from the most unlikely of quarters. In July this year the town's Conservative MP Anthony Steen used his monthly newspaper column to highlight the importance of the Totnes model and the dangers of complacency regarding peak oil. 'Rob is clearly very driven by his passion,' says Steen. 'He has set a precedent that has achieved an enormous amount in a very short time. We are all just waiting to see where it will go from here.'

Rob's passion is the catalyst that has sparked off Transition Culture, and he is seen by many as the figurehead of the movement. Although aware of his growing profile Rob remains grounded by more than a decade of working directly with

the soil. 'I prefer to see my role as a promoter of transition culture as a positive response to peak oil.'

Transition, it seems, has arrived at a time of change. As Rob points out: 'The potential of this time is immense and the scale of the challenge is unique, the tools of lobbying, campaigning and protesting are no longer sufficient, transition effectively provides us with new tools to face new challenges.'

In the past 12 months alone, 20 new transition initiatives have sprung up across the UK from cities the size of Bristol to tiny rural hamlets. A further 90 are undergoing the initial stages and Rob receives at least two new enquiries every week.

When I ask Rob if the transition initiative has an ultimate goal or a destination, he hesitates slightly before offering one of his infectiously enthusiastic smiles: 'There are 1000 towns and cities in the UK, 10,000 villages and twice as many hamlets. Ultimately, I have a faith that the ingenuity and resourcefulness that got us up to the top of this peak in the first place has the potential to take transition to every single one of these communities'.

And with that I notice that the rain outside has stopped, the sun is shining and the world suddenly seems a lot brighter. **E**

Further information:

Transition Town Totnes:

www.transitiontowns.org

Transition Culture:

www.transitionculture.org

The 12 Steps to Transition

- 1 Set up a steering group and design its demise from the outset: A core team is essential for driving the project forward during the initial stages and planning for 'The Great Unleashing'.
- 2 Awareness raising: Above all, this stage must be fun, imaginative and engaging. It is intended to inform the community about the realities of peak oil through film-screenings, presentations, talks and networking.
- 3 Laying the foundations: Identify and liaise with existing community groups and acknowledge the vital roles they have to play in the transition initiative.
- 4 The Great Unleashing: The event should be spectacular but also informative, introducing the wider community to the concepts of peak oil and climate change.
- 5 Form working groups: Ideally the 'core' working groups should be among the first, including food, waste, energy, education, economics, transport, water and local government.
- 6 Open Space: In theory, this forum model shouldn't really work, having no agenda, no timetable, no obvious co-ordinator and no one to take minutes. However, Totnes has so far run successful Open Spaces on food, energy, housing and economics.
- 7 Develop visible practical manifestations of the project: This stage is essential for capturing the imagination of the community and demonstrating the potential of the transition initiative.
- 8 Facilitate the Great Reskilling: Many of the skills that our grandparents took for granted have sadly been lost to mechanisation and industrialisation. Transition represents an exciting opportunity to reinvigorate traditional crafts that are essential for a post-fossil-fuel economy.
- 9 Build bridges with local government: Whether it's planning issues, funding or simply endorsement, the support of your local authority is essential if the Transition initiative is to be entirely successful.
- 10 Honour the elders: Local knowledge is one of the greatest sources of inspiration and ideas within your community. Those of us who can still remember the transition to the age of cheap oil represent a wealth of information.
- 11 Let it go where it wants to go: 'Predetermining the outcome,' as Rob says, 'is going to really wind you up!' Keep your focus on the key criteria and watch as the collective genius of the community creates highly inventive solutions.
- 14 Create an Energy Descent Action Plan: This is really the pinnacle of the transition process, the plan should be exhilarating to read, illustrated with stories and photos to provide an inspirational vision of a powered-down community.





Nature's free for all

With the worst summer on record decimating his potatoes, onions and other allotment crops, **Paul Kingsnorth** turns to nature's abundance in foraged food

There's no longer any point in denying it: it's been a terrible year. Down on the allotment, everyone's grumbling about it. Constant rain and virtually no sun have been a bad combination. According to the old men, who know these things, it's been 'the worst growing season for 30 years'. I'm not about to argue.

My onions got white rot – a hideous fungal disease that means I can't



While it's been a terrible year for veg, it's been a fantastic year for foods of the wild

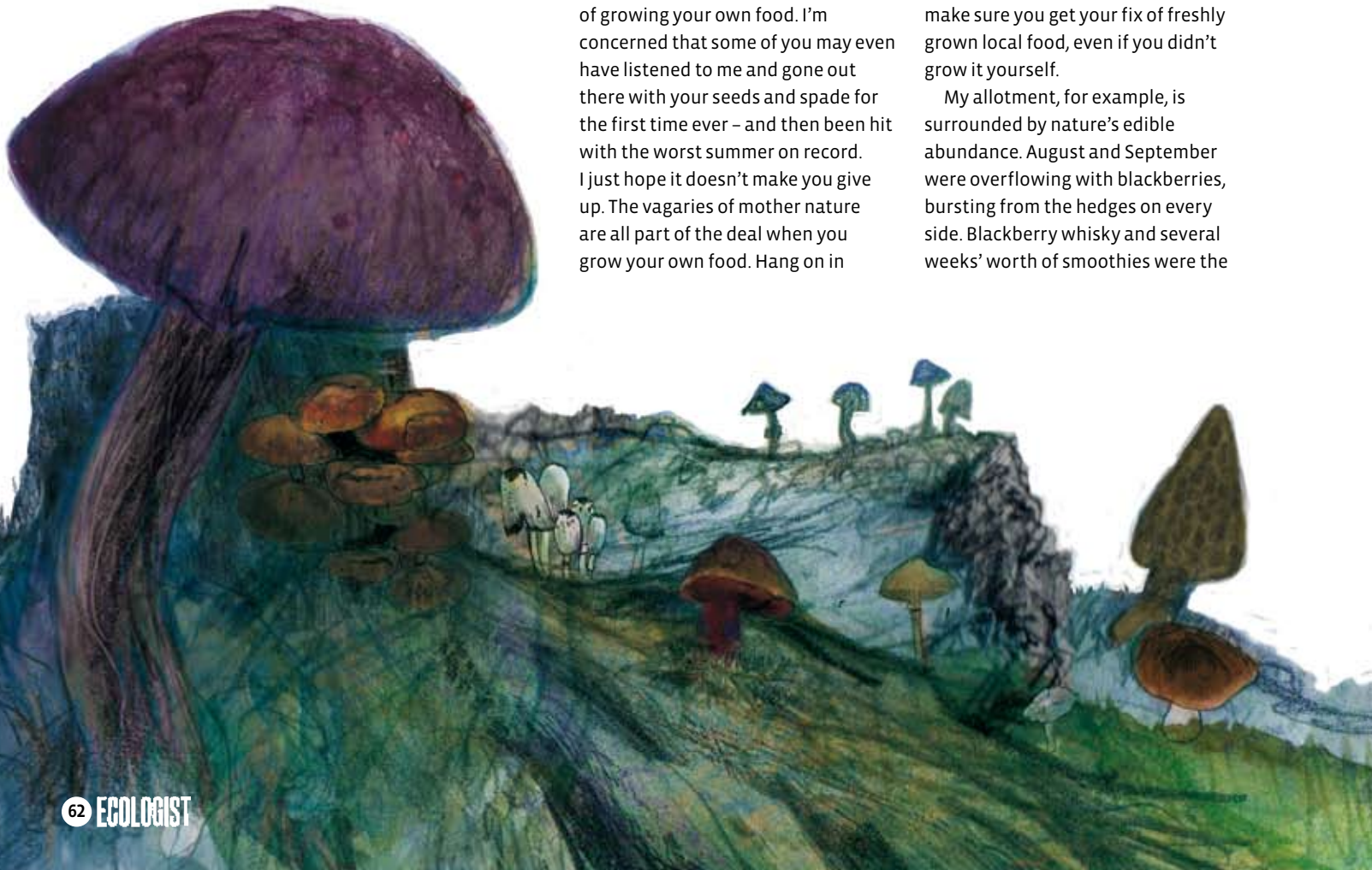
grow onions in the same soil again for 20 years. My potatoes got blight. Half the things I planted didn't even germinate. And I was one of the lucky ones. Other people gave up altogether. A friend of mine went down to his allotment in July to find it under five feet of floodwater, with the planks from his lovingly-constructed system of raised beds floating away on the current.

What worries me about all this is that I've spent the past year writing columns about the wonders of growing your own food. I'm concerned that some of you may even have listened to me and gone out there with your seeds and spade for the first time ever – and then been hit with the worst summer on record. I just hope it doesn't make you give up. The vagaries of mother nature are all part of the deal when you grow your own food. Hang on in

there – with any luck, next year will be gorgeous, and your crop will be so abundant that you'll never look back.

Right now, though, I think we all deserve some compensation for the terrible year. And what nature taketh away in one department, she giveth in another. While it has been a pretty terrible year for vegetables, it's been a fantastic year for fruit, nuts and other foods of the wild. So if your vegetable patch isn't providing, try looking further afield at what nature has to offer. One way or another, you can make sure you get your fix of freshly grown local food, even if you didn't grow it yourself.

My allotment, for example, is surrounded by nature's edible abundance. August and September were overflowing with blackberries, bursting from the hedges on every side. Blackberry whisky and several weeks' worth of smoothies were the



result of this. Up the other end of the plots, where things get wild and scrubby, there's a line of hazel trees whose nuts are usually nicked early by squirrels but which this year were curiously abundant. They're a million times better fresh than they are in string bags at Christmas.

Earlier in the year, the flowers of the elder tree by my shed had made me bottles and bottles of elderflower champagne, which tastes gorgeously flowery and subtle, and fizzes just like the real thing. In September, the berries are good for wine-making; something I've not yet tried, though last year I did have a pop at elderberry ice cream. I don't recommend it, frankly. Still, you never know until you try.

Half a mile up the road, meanwhile, is a little suburban park. It's got everything: a bandstand, crazy golf, nicely tended flowerbeds, a stream, a kids' playground. More importantly, though, it's got mulberry trees. Most people don't seem to know what these are, or what they're missing: giant reddish blackberries that look like oversized loganberries and taste great. You can do plenty of things with a mulberry, apparently – make jam, wine or pies – but all I've ever done is sit under a tree and eat them fresh.

A mile or so from the park is a golf course, surrounded by scrubland. Here, in autumn, you can usually find mushrooms in abundance – especially in a wet year. You need to be a bit careful here. I'd never go mushroom-picking on my own: you have to really know what you're doing, or your stomach could suffer. Some of the most poisonous mushrooms in the country look like some of the most edible. Get it right though, and you've got a field mushroom omelette for dinner. Or maybe you could find

“
If your leeks failed, and your tomatoes flopped, get out into the hedgerows with a basket



For where to buy organic food and drink see the listings beginning on **p 73** of our shopping guide



something more unusual: some cep mushrooms, perhaps, or some morels; the kind that cost you a packet in Waitrose. Or, if you really know what you're doing, you could find something truly exotic, like the giant, yellow tree fungus known as 'chicken of the woods'. I've tried it myself, and if you cook it properly it does have something of a chicken flavour.

Some people really know what they're doing. Eighteen months ago, I wrote in the *Ecologist* about a day spent out foraging in the countryside of Kent with Fergus Drennan, one of the country's few professional foragers. Fergus knows so much about the foods that nature provides that he actually manages to make a living out of it. When you or I look for wild foods, we look for the obvious – the kind of thing I've talked about above. Fergus goes further. There's not a weed he can't eat, and not a habitat he can't make a meal from.

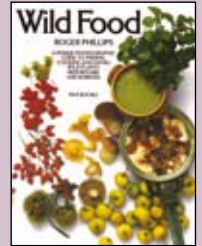
Since I wrote about Fergus, foraging really seems to have taken off. He's been on the radio, made a film, written a book and seen people come running for the day-long foraging courses he runs in Kent. I found myself on Radio 4's consumer programme *You and Yours* with him a few months ago, explaining the joys of wild food to the slightly bemused presenters while Fergus cooked some of it up in the corner.

Foraging, in other words, like vegetable growing before it, is taking off: another spanner in the works of the global food machine. And however hard that machine works to persuade us that nature is dirty and dangerous, and that only laboratories and superstores can provide us with our nutritional needs, some of us are still not convinced. So if your leeks failed this year, and your tomatoes were a flop, never fear: get out into the hedgerows with a basket and try it yourself. You never know what you might find. **E**

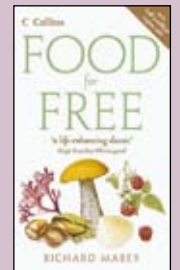
Useful resources

- Fergus Drennan's website is www.wildmanwildfood.com

- Wild Food by Roger Phillips (Pan) is another classic guide, full of great recipes. Take at least one of these out with you if you can.



- Richard Mabey's classic book *Food for Free* (Collins) is as useful as ever.



- All my previous columns on allotments and food growing are collected on my website at www.paulkingsnorth.net

Contact me

With questions, comments or anything you think I should know. Email: growit@paulkingsnorth.net



No fashion please

Matilda Lee speaks to the 'Gucci of outdoor wear' – Patagonia's Yvon Chouinard – about how not to sell clothes





Left: Women's Synchilla vest in Ecology Green, £50
Right: Men's Infurno Jacket in Alpaca Brown, £215
Below: Men's Rum & Cola shoes in Dark Teakwood, £120

Vogue magazine called me one day from New York saying "Oh my gosh, oh my gosh, all the models, Naomi and everyone, are wearing your Synchilla jacket. What are you going to do?" As Yvon Chouinard, founder of Patagonia, tells the story, the news made him recoil. In the past 35 years, as he built up one of the world's best known outdoor clothing companies, fashion was not something that Patagonia *did*.

In truth, Patagonia's core customer is more likely to be a Hawaiian grandmother, who clocks up hundreds of miles kayaking solo in the North Pacific. 'Our philosophy is to make the best product; that means clothing that doesn't wear out or need ironing and definitely no fashion,' he says. Surprisingly, this has brought Patagonia an impressive numbers of 'firsts'.

In 1996, Patagonia switched all its cotton to organic and has never looked back. Only recently have apparel giants such as Nike and Timberland started to do the same. In 1993, Patagonia started to produce post-consumer recycled polyester fleece. Out of every 25 recycled plastic drinks bottles comes one fleece. Since then, it has diverted 92 million bottles from landfill. This year, Marks

& Spencer came out with its own line of recycled fleeces. Patagonia's first catalogue using recycled paper was in 1990.

Asked about his greatest achievement, Yvon points to the 'earth tax' that Patagonia started paying in 1985, which is either 10 per cent of profits or 1 per cent of sales, whichever is greater. This has resulted in grants of more than \$25 million to grassroots environmental groups that other grant-making groups deem too politically risky. 'We measure our success on the number of threats averted: old-growth forests that were not clear-cut, mines that were never dug in pristine areas, toxic pesticides that were not sprayed,' he wrote in his book *Let My People Go Surfing*.

In 2001, he expanded the 'earth tax' idea to create the '1 per cent for



Our success is measured in old-growth forests not cleared, and mines not dug

the planet' club, encouraging other companies to donate 1 per cent of their sales. There are now over 700 member companies (46 in the UK) throughout 20 countries that have, so far this year, contributed \$21 million to environmental organisations.

Yvon isn't surprised most 1 per cent members are smaller, privately owned companies and start-ups: 'The revolution starts at the bottom.' Shareholders of big publicly owned companies are not the most progressive when it comes to the idea of 'giving back'.

'I was recently on a panel that included Coca Cola, reps of which spoke about how they will start recycling plastic bottles next year. They were completely unaware we've been reusing their bottles for the past 15 years. I asked why aren't they proactive on issues, instead of just waiting until the customer demands it.

If, for example, Coca Cola



Eco clothing

switched from high-fructose corn syrup to cane sugar [which is more fully metabolised], this in itself could change the world. They just stared at their feet.'

From the modest beginnings of its 2005 Common Threads Garment Recycling programme, where customers return old underwear and fleeces, Patagonia has now committed to having all its clothes made from recycled materials by 2010. Will it manage it? 'We should reach at least 90 per cent by 2010'. It has become the guinea pig of a new \$100 million polyester recycling plant in Japan, which takes all things plastic and polyester and reprocesses them into fabric. 'In Japan they are thinking about the end of petroleum and understand we're running out.'

An in-house Lifecycle Analysis revealed that recycled polyester brings 76 per cent in energy savings compared to using virgin polyester. While the fabric comes from overseas, garments will be sewn in California and Mexico. 'With the end of petroleum the cost of shipping will be the highest. But when you look into it, as we did, shipping by sea brings less damage than trucking throughout California. Local doesn't necessarily mean less energy.'

'We're the last big privately owned outdoor company in the US, all the rest are owned by bigger multinationals. If we sold out, buyers would realise we're undervalued, and we'd lose our image and purpose in a grab for growth. We spend less than one half of one per cent on advertising and have intentionally held growth back. We

held growth back. We



don't want to create artificial demand,' he says.

He likens commercial growth to learning how to ski. 'You start out shaky for a while, have one lesson then jump to plateau. A learning curve isn't smooth. With Patagonia, one-year growth is 10 per cent and another 3 per cent. Growth stems from recognising our customers are frustrated because they try to order and we're out of stock.'

In the dying days of August, from his log cabin in Wyoming in the Teton mountain range, where Yvon has spent summers since 1956, he reflects on a lifetime of climbing, fishing and surfing. 'A lot of the climbs I used to do no longer exist. The experience was in doing it and now it's over. I've witnessed the decline of the Atlantic salmon, the near end of the steelhead, [rainbow trout] my favourite fish. It's really sad it's all changed.'

Do thoughts of climate change and peak oil keep him awake at night? 'Oh no, I sleep. I'm not trying to hold on to anything, not trying to hang on to the idea that we are God's ultimate creation. We are a destructive



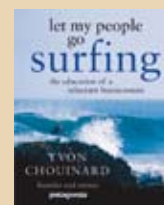
Above left: Women's Capilene V-neck, £25. **Above right:** Women's Nanuq Jacket in Tinted Ice, £320. **Below left:** Women's Sugar & Spice Mary Jane shoes, £90 **Below right:** Men's Capilene Zip Neck in Real Red, £25

species. The best thing I can do is lead an examined life, bear witness and report back to headquarters.'

A humbling thought that colours his own mission with Patagonia: 'There is no doubt that we're not going to save the world by buying organic food and clothes - it will be by buying less.' **E**

Patagonia can be ordered online at www.patagonia.com or call

Yvon's book *Let My People Go Surfing* (Penguin Books, 2005) is a rumination on subjects ranging from climbing to business ethics, with a history of Patagonia in between. Required reading for anyone trying to make heads or tails of how business can be a force for good.



Reader survey 2007



By taking a few minutes to complete this brief questionnaire you will help us to understand more about what interests you. Return it to the FREEPOST address by 30 November and you will be entered into a prize draw for a £75 hamper, courtesy of Daylesford Organic (details overleaf)

Please tick boxes that apply:

1 How long have you been reading the *Ecologist*?

- This is my first issue
- Less than 1 year
- 1 to 2 years
- 2 to 5 years
- 5 years or longer

2A How often do you buy the *Ecologist*?

- Every issue/almost every issue
- Quite often
- Only occasionally
- This is my first issue

2B Do you subscribe to the *Ecologist*?

- Yes
- No

3 How much of a typical issue do you read?

- All or most
- More than half
- About half
- Less than half

4 What do you like about the *Ecologist* magazine? (Please indicate all that apply.)

- It highlights issues before the other media
- I find it really challenging
- I want to know more about ethical products and businesses
- I value its in-depth analysis of the news
- I want to know how I can be more involved
- It has a good mix of features and practical advice
- It helps me to keep informed for my job
- The articles are thought-provoking
- Other _____

5 Which of the following sections do you normally read? (Please indicate all that apply)

- Letters
- News

- News focus
- Act
- Comments
- Behind the Label
- Photo essays
- In depth/Investigative articles
- Green Pages

6 Which of the following statements most accurately reflect your views about the *Ecologist*? (Please indicate all that apply)

- The articles are about the right length
- The articles are too long
- There are too many articles to read
- The design grabs my attention
- Other _____

7 Specifically about the Green Pages, which sections do you read most often?

- In Season
- Local Hero
- Grow Your Own (Paul Kingsnorth)
- Wine (Monty Waldin)
- Eco Fashion
- Health (Pat Thomas)
- Home
- Parenting

8 What subjects would you like to see more of?

- Baby, child issues and parenting
- Companies to avoid
- Product comparisons
- Natural beauty products and techniques
- Inspiring people
- Food
- Sustainable home design
- Travel
- Sustainable business products
- Ethical finance
- Ethical jobs and careers
- Campaigns
- Self improvement
- Home improvement
- Other _____

9 What do you read the Green Pages for?

- As a shopping guide

- For the special offers
- To get practical advice on how to be greener
- They inspire me to make changes
- Other _____

10 Are you?

- Male
- Female

11 Into which of the following broad groups does your age fall?

- Under 25
- 25-34
- 35-44
- 45-54
- 55-64
- 65-74
- 75+

12 Which of these best describes your current work status?

- Full-time employed
- Looking after children/the home
- Part-time employed
- Fully retired
- Run own business
- Self-employed/consultant
- Semi-retired
- Student
- Other

Please provide your name and telephone number and/or email address if you would like to be entered into our prize draw (see details overleaf)

Name _____

Phone number _____

Email _____

Please tick here if you do NOT wish to receive relevant information about products or services from the *Ecologist* magazine

Please tick here if you are happy for us to pass your details to carefully selected companies so they can send you relevant information about their products or services



Fill out the survey overleaf and return using the envelope below, to be entered in a prize draw to win a £75 Daylesford Organic breakfast hamper

Contents

Daylesford Organic...

- Smoked salmon 200g
- Coffee beans 500g
- Strawberry jam 227g
- Porridge oats 500g
- Apricot compote 370g
- Natural Cotswold honey 454g

Plus...

- Organic Champagne 75cl
- Wooden porridge spirtle
- White basket

Daylesford Organic Our philosophy

More than 20 years ago, we began to turn our family land in the Cotswolds and Staffordshire over to sustainable, organic farming. It was the start of a passion: to grow crops naturally and rear healthy animals for local people; and to feed our children better. We had joined a mission to reverse the industrialisation of our food, and the pollution of the land that nurtures it.

At Daylesford Organic we are dedicated to growing, producing and cooking real food, organically. It must be fresh, and full of texture, succulence and flavour – with the full complement of vitamins and minerals that can only come from natural food that is eaten at its best: in season.

In accordance with this philosophy, we

practice organic, sustainable farming, without using dangerous pesticides and herbicides on our crops. We do not use artificial growth promoters, antibiotics and drugs on our animals. All Daylesford Organic products have full certification from the Soil Association.

Daylesford Organic Farmshop is situated in Gloucestershire and we also have shops and concessions in London – Pimlico Road, Sloane Square, Clifton Nurseries, Selfridges and Harvey Nichols – and offer a nationwide mail order service.

Contact details:

Daylesford Organic Farmshop, Daylesford,
Near Kington, Gloucestershire GL56 0YG
Telephone 01608 731 700
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The plastic party syndrome

Frustrated by the disposable hangovers from her kids' parties, **Hina Patel** made it her business to make goodie bags green



Children's parties – many of us have spent countless hours attending them, not to mention throwing them.

Accompanying my two daughters (now aged five and nine) on the party circuit, I began to notice what I now call the 'plastic party syndrome'. Everything from the cups and plates (even those made from paper often have a plastic lamination), cutlery, tablecloths, hats, party poppers, decorations, food packaging, gifts and not forgetting the party bags and their contents is made from plastic.

This plastic will almost certainly end up in the bin and if you think about how many parties must take place, you can imagine the environmental impact.

Plastic doesn't biodegrade and will stay in our landfills for hundreds of years, potentially leaching harmful chemicals that can affect the health of our children.

I trained as a dentist and worked for 12 years before becoming a full-time mum after the birth of my second child five years ago. In December last year, after years of increasing frustration at not being able to find eco-friendly choices for my children's parties that were affordable, and talking to many parents who felt the same, I decided finally to take the bull by the horns

and start my own company supplying an eco-friendly range of party goods, from party bags and goodies to tableware, cards, gift bags and gifts that are unique, stylish and affordable.

I started by looking into the type of products and where to get them. I knew what materials I wanted to use – wood, recycled paper, pure wool, felt, cotton, natural fabrics – and include more unique designs. Because I can only order small amounts, I contacted manufacturers directly and, at times, asked if they could provide me with particular items.

I found a fairtrade felt manufacturer in Kathmandu, Nepal and asked it to make felt necklaces, bracelets and purses. Our wooden items come from a UK-based supplier.

Business Link helped with the rules and regulations of starting up your own business, dealing with importing goods and their taxes and duties. My family, friends and other mums have also been extremely helpful, especially as regards reviewing products.

I've now got an arsenal of sustainable party goods and am constantly on the lookout for new alternative gift ideas. Our 'warehouse' is the spare bedroom and the whole business is run from our home.

Since the website went live this May I have had positive feedback about filling this gap in the market. Even some restaurant chains have got in contact, interested in kids goodie bags.



My goal is to reduce the plastic mountain. Wood can be just as fun to play with as plastic.



Hina's green party tips

The planning of a party is a great time to talk to our children about what things are made from. Sustainable alternatives could be:

- Paper tablecloths, paper cups and plates with no plastic lamination. Wooden cutlery.
- Decorations can be made at home with your children using paper and card.
- Party bags can include paper, natural fabric, jute or recycled plastic party bags. Fill them with wooden toys, cardboard, good-quality sweets and paper or recycled goodies rather than the cheap plastic variety.



I next aim to tackle Christmas gifts. I've noticed when my own kids open presents that the pile of wrapping is just as big as the pile of toys. Along with plastic gifts, there is also a lot of plastic packaging.

I'm hoping that the market will take off and there will eventually be more suppliers. My ultimate goal is to reduce the size of the plastic mountain and to make children think about the things they are getting. Wood can be just as fun to play with as plastic. **E**

As told to Matilda Lee

www.HappyGreenEarth.com

Tel: 0845 3880931



Paint for life

Quick fading and blandly coloured they are not. Eco paints may be thicker and require a primer but the benefits, not least to our health, outweigh the extra labour. By **Matilda Lee**

I had never used eco paints before, and I never will again.' Not the most encouraging comment to hear from someone who has just painted three rooms of your house, but our decorator was at the end of her last day.

My husband is asthmatic and we have a two-year-old son, so when repainting our new house, naturally we chose paints least likely to irritate. Eco paints, as opposed to most conventional paints, are based on natural oils and clay instead of petrochemicals. Still, we didn't know what to expect.

Seen for the first time, we were pleasantly surprised. All the colours looked fabulous. And a day after the paint went on, miraculously, there was absolutely no smell.

From our decorator's point of view, however, it meant applying a coat of primer plus up to three coats of paint, and more elbow grease because the eco paints were much thicker.

Once our decorator had had a night's rest, I inquired again: 'From a labour point of view, it's more difficult,' she says. 'But from a health point of view it's a 100 times better. I've never come across paint with no smell. Normally when I've

done a whole day's work of painting I usually have some kind of headache, but with this paint, there was absolutely nothing.'

The Red Cherry we used in the kitchen is from Earthborn, founded by John Dison in 2002. Earthborn's paints are manufactured by Ecotech in Germany, but their colour palette is unique to the UK.

'Eco paints started out pretty environmentally friendly but were rubbish,' says Dison. 'Today, choosing eco paints means you get more for your money. They perform as well as conventional paints with added benefits.' So why are they difficult to spread? 'Most paints have lots of water and are particularly thin – our paints are based on clays, plants and earth pigments.'

On the dining and living room walls (pictured) we used paints from Self-Coat, which offers a palette of more than 600 colours and a colour matching service. Based on natural oils, only 6 per cent of its make-up is water,

“

With eco paints you get more for your money – they perform well and there is no bad smell

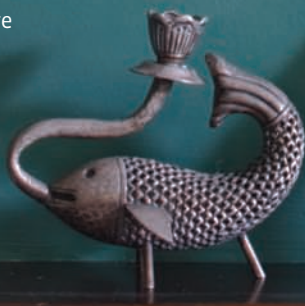
which is why it is thicker and more laborious to apply.

Importantly, the paints are breathable to accommodate the natural contraction and expansion of the moisture. If paint is not porous then it starts to bubble, crack and peel. A fact that points to Self-Coat's confidence in extending a 10-year guarantee if there is any fading.

Self-Coat paints, initially developed in South Africa but manufactured near Manchester, are free of volatile organic compounds (VOCs), solvents, petrochemicals and fungicides.

Daniele Ronchese, Self-Coat sales manager, says, 'There is little effort to raise awareness about paints as the impacts of exposure are long-term.'

With the rise of the 'sick building syndrome', our homes have been breeding ill health. Our decorator may have tired arms, but at least she, and we, can expect peace of mind.





Left: Matilda's dining room in Grace Blue (Self-Coat)

Right: Matilda's kitchen in Red Cherry (Earthborn, www.earthbornpaints.co.uk)



What's that smell?

Conventional paints can include acrylic, polyurethanes (PUs), PVC and volatile organic compounds (VOCs). VOCs are carbon-containing compounds that become a gas at room temperature during the manufacture, application and deterioration of paint. When paints 'off gas', the fumes that come off the wall could be the emissions from VOC solvents evaporating into your home.

According to the US Environmental Protection Agency, the health effects of VOCs include eye, nose, and throat irritation; headaches, loss of co-ordination, nausea; damage to liver, kidney and central nervous system. Some are suspected or known to cause cancer in humans. By the end of this year, all EU paints must include a VOC-content label. By 2010, when EU legislation tightens, VOC content must drop to 30 grammes per litre from the current 75 grammes for water-based paint and 400 grammes for solvent-based paint.

Photography: TIM PIKE

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- 82** Up to £5 off bodycare products from Aubrey Organics



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Food and drink

The online producers below supply genuinely fresh, seasonal fruit, vegetables, fish and meat. And what could be more convenient than having your cooking essentials delivered direct to your door? You can also feel safe in the knowledge that you're buying environmentally sound, delicious food that supports small, independent producers

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Do you live near a farmers' market? For a list of farmers' markets around the country, go to www.whyorganic.org. Farmers' markets are a great source of locally produced, fresh, seasonal fruit and veg. If you don't live near a good greengrocer or farmers' market, the next best thing is to sign up for a local box scheme. For 15 reasons to join one, and a list of suppliers, go to www.theecologist.org and click on 'find your local boxescheme'.

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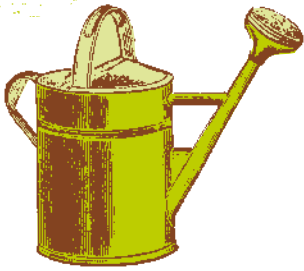
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★ Powertech Solar

12% off Suntech low-energy light bulbs

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- CFL Spotlights – the low-energy alternative to using halogen bulbs.

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Using the local Spar store as a cost and payback example, which has the lights on from

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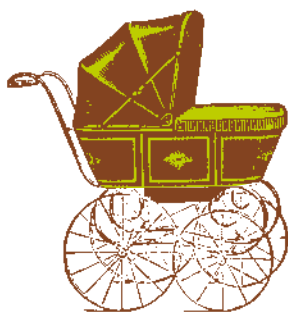
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Parenting

Shopping guide

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The amount of baby gear we buy – such as nappies, wipes, bottles, car seats, pushchairs, clothes, shoes, toys and other nursery items – is staggering. Given the ongoing cost of raising a child and the heavy competition that exists between manufacturers, as consumers we would do well to read and understand labels and buy fewer but better products

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Exporter at the Cornwall Business Awards, Cut4Cloth (www.cut4cloth.co.uk) makes funky, fresh and fun organic sumptuously soft clothing for babies and children. Started by Lucy Jewson three years ago in the spare room in her Cornish cottage during her maternity leave, one of its main objectives is to not only encourage parents to support fair trade principles, sustainable business and strong environmental ethos

but also to make high-quality, comfortable, organic clothing that is affordable, versatile and fashionable. Cut4Cloth are members of '1 per cent for the planet' – an organisation (see profile page 64) started by Yvon Chouinard of Patagonia in 2001. This means that 1 per cent of all their sales goes towards protecting the environment. While most of my son's clothes are second-hand, it is a rare treat to have something from Cut4Cloth, as the clothing really is soft, comfortable and hard-wearing.
Matilda Lee



Clothing

The virtual boutiques and retailers featured on these pages stock a range of well-made, stylish and ethical clothes. Precise sizing charts make it easy to find the right size for you - and if something doesn't fit, or you don't like it, simply return it. Being fashionable and being ethical are no longer at odds...



Green Shoes

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Green Shoes hand-make stylish ethical footwear and accessories at its workshop by the River Dart in Devon. Its creative team combine traditional skills with the best contemporary design to make an ever-growing selection of bags, belts and jewellery, including many styles made from Eco-Tan. This unique, natural leather, which has a light and supple feel, is organically tanned using sustainably harvested pure plant agents and oils to the highest environmental standards for leather production, and is free from heavy metals and toxins.

- Green Shoes choose only the finest, loveliest materials for its

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Bodycare & cosmetics

The best way to ensure healthy skin is to maintain a healthy diet, get enough sleep and keep stress levels low. If you do buy products for your face or body, try to make sure they are based on natural ingredients. The companies listed here carry products that have not been tested on animals; they contain no parabens, no petrochemicals and no synthetic ingredients

Aubrey Organics



Organic skin, hair and bodycare

Aubrey Hampton is often considered the godfather of natural cosmetics. He 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. Since then Aubrey Organics has become a household name in the US, although its founding principles remain the same. All ingredients are sourced at a fair price; there's no animal testing; products are hand-made in small batches; they're all natural and, where possible,

organic and they don't contain synthetic petrochemicals. Aubrey Organics doesn't warehouse its products but gets them on the shelf as fresh as possible – so what you buy is likely to be only a few months. There's also no use of dehydrated ingredients.

The Aubrey Organic range has everything from shampoos and conditioners to night creams, deodorants and hair gel. Its soothing Organic Aloe Vera gel is so effective it's used in several burns units!

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boosting natural immunity.

Ginger: Warming and stimulating, it's used to prevent and treat coughs, colds and flu.

Elderberry: Boosts natural immunity and is useful in preventing coughs and colds.

Peppermint: A decongestant herb that helps to clear heat from the head and eyes. It can be used to treat feverish colds and flu.

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Home energy

Use your electricity bill to help fight climate change. The Ecologist and Ecotricity have teamed up to make it as easy as possible to support the transition to clean, locally supplied energy – and we encourage you to take steps at home to reduce your energy demand.

Eco power campaign

How do we meet the UK's energy needs from clean, renewable sources of energy that come from sources as local as possible?

- 1 Switch to Ecotricity as our energy supplier
- 2 Reduce our energy demand
- 3 Localise our energy supply... individually and in our communities

Our current energy sources are non-renewable and increasingly expensive: gas (40 per cent), coal (30 per cent), nuclear (20 per cent) and oil (5 per cent). We need to move to non-polluting, small-scale energy sources generated as close to users as possible, such as wind, hydro, solar and tidal.

What's wrong with nuclear?

Dale Vince, founder and CEO of Ecotricity, says, 'Fossil fuels days are numbered. Nuclear, often held out as the answer to our looming energy gap, is not a renewable fuel. Uranium is finite; its cost has risen ten-fold in the past year or so, on the back of increased worldwide usage. It's another fossil fuel story waiting to unfold: mining will peak, demand will outstrip supply and it will one day run out. Renewable energy is the only energy source we can use once and then use again and again, and it's the only sustainable energy source.'

HAVE YOU MADE THE SWITCH?

Switching to Ecotricity for your electricity supply is one of the easiest single things any of us can do to fight climate change.

Why Ecotricity?

Only around 5 per cent of the UK's energy is currently generated from renewable sources, and we need much more if we are to tackle climate change effectively and live more sustainably. Ecotricity is dedicated to building new sources of renewable energy – the only way to change the UK's energy mix and effectively fight climate change. The more customers it has, the more it can build – it's as simple as that!

For every pound that Ecotricity customers spend on their electricity bills, Ecotricity spends a pound building new sources of clean energy – which it calls New Energy. This is not just an aspiration: over the past three years, Ecotricity has invested, on average, £430 per customer each year. The typical household bill in the UK is about £400 – so Ecotricity invests your entire bill in New Energy, which means real carbon reductions.

Why switch now?

This year Ecotricity will invest £25 million in New Energy, doubling its wind capacity from 27 to 54 megawatts in the process. It does this with the support of 30,000 customers right now. With 100,000 customers it could invest over £40 million – build around 53 megawatts of electricity and save roughly 200,000 tonnes of CO₂.

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★ **100,000**
TARGET

★ **30,501**
Current level

★ **18,009**
July 2006 customer level

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- Energy Saving World**
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- Nigel's Eco Store**
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- SUPPLIERS**
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- GROUND SOURCE HEAT PUMPS**
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- Green Systems**
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www.kensaengineering.com
- Powertech Solar**
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... and the rest

On these pages you will find products and services that do not fall into our first five classifications, but which are essential to the well-being of our planet, and which help you to reduce your carbon footprint. If you think you have something to offer that we have not listed here, please let us know

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ECOLOGIST

Advertising Manager

The Ecologist is looking for a self-motivated, advertising sales professional to nurture and develop our client base. This is a crucial role to the magazine's continuing success and offers a fantastic opportunity to help grow the market for ethical goods and services.

The Role

Reporting to the Publisher, this is a full-time role based at the Ecologist's office in London but with the possibility of home working for the right candidate.

The Advertising Manager is responsible for managing all aspects of the Ecologist's advertising and ensuring delivery of agreed revenue targets. The successful candidate will be selling across display, inserts and online, managing copy, working with production on page planning and liaising with accounts to ensure accurate and timely invoicing.

A key element of the role is maintaining strong relationships with established clients whilst capitalising on the growth in the ethical sector by securing new clients for the magazine. This will involve working closely with organisations to help them find appropriate ways of talking to our readers.

The Person

You will be working independently so the ideal candidate will be an enthusiastic self-starter who, in addition to having a proven track record in media sales, should be exceptionally well organised, able to prioritise a varied workload and must be confident speaking to and working with a range of people and organisations. You must have an eye for detail, maintain accurate and up-to-date records, and understand the importance of working to deadlines.

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A world without humans

If people weren't around any more, what would the world be like? **Matilda Lee** finds some possible answers in a fascinating new book

We've read about the collapse of ancient civilisations from environmental destruction, and there have been many predictions of our future demise from the same cause. Alan Weisman's book projects an altogether different scenario. What if human beings suddenly, instantly, vanished from the earth, forever? How would the planet fare without us?

The axis of *The World Without Us*, and why it is such a good read, is that Weisman essentially depicts the battles between the man-made world and nature that would play out if humans weren't around to provide the Herculean effort to maintain our way of life. And how fragile and precarious that way of life is!

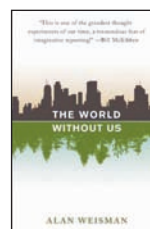
New York City's subway system, for example, is prevented from collapse daily through a system of 750 pumps around the

city, which gets rid of the 13 million gallons of water from rain, trapped underground streams and water-main bursts. Manhattan's soil and the forests that used to soak up its 47 inches of annual rainfall have been removed, but we can't stop it from raining. Without humans there would be no power, hence no pumps, and in 36 hours, the entire subway system would be flooded.

Over the past half century, Weisman explains, we have created one of our most long-lasting legacies in the one billion tons of myriad plastics we've produced, most of which, it is pointed out, don't end up in landfill, but in our oceans and seas.

Even if humans ceased to exist tomorrow, he speculates it would still take circa 100,000 years for the marine garbage patch to photodegrade or be digested by an as-of-yet uncreated microbe that might evolve.

Not just a groundbreaking thought experiment, *The World Without Us* is meticulously researched: Weisman's topics span the globe, as do the experts he interviews. He uncovers how long our greatest achievements and our biggest mistakes would last after we are gone and grapples with some of the key issues of our time. From historical references to news reporting, he builds up a story around each theme, the results of which are fascinating.



The World Without Us

By Alan Weisman
(Virgin Books, £20)

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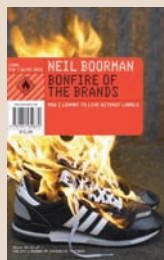
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Living without labels

Bonfire of the Brands

Neil Boorman (Canongate, £12.99)

Ex-big-brand addict, style journalist and brand promoter Neil Boorman decided to torch publicly all £21, 345 of his branded possessions, decimating his furniture and electrical equipment with an unbranded sledgehammer, and vowed to live brand-free for six months.

Narcissistic? Violent? Damaging to the climate? Quite possibly. Nevertheless, Boorman's gesture was certainly loud, and his story received national media attention.

Bonfire of the Brands brings together Boorman's published blog documenting his brandless life. His story is punctuated by deconstructions of the manipulative mechanisms of branding and a history of the past century of consumerism in the UK.

Recording his visits to a psychologist and recounting his personal experiences, he illustrates the capacity that brand messages have to infiltrate our lives and existence on a discomfortingly intimate level.

While no substitute for more heavyweight anti-brand publications and as patchy as any blog, it's a funny, light read and gives an informative and broad account of consumerism, with thought-provoking personal illustrations of a life without labels.

Neil Boorman's blog can be read at www.bonfireofthebrands.com. **Miles Howe**

Nature for beginners

Don't know your frogs from your toads? Your dandelions from thistles? This is the book for you, says **Olivia Percival**

In this delightfully readable and informative reference book, Johnson P. Johnson – known among his colleagues as ‘the naturalist’s naturalist’ – takes the reader on a concise, detailed whistle-stop tour of the flora and fauna of Great Britain. From hedgehogs to hedgerows, bluebells to seashells, he ensures that his writing is both sensitive and manageable. These, however, are the only signs that he himself is self-taught.

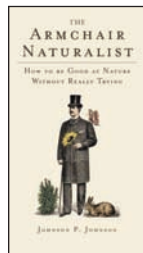
The small, hardback book devotes two small pages to each subject, each with an amusing (some more so than others) play on words to start. The majority of the text is focused on how to identify the subject. The author’s style is anecdotal, yet instructive and extensive, each page alive with his enthusiasm for nature.

As the title suggests, the book’s sole purpose is to act as an introduction to the intricacies of nature for those previously unacquainted with them, though this angle may unnecessarily limit its possible readership. Its detail is sufficient, however, that it explains all about the various species while also including historical and obscure facts that even an already keen naturalist would find interesting.

It is, in essence, a practical guide that directs readers away from the possible

pitfalls of misidentification. Most pages have a text box entitled ‘Easy Nature’, which contains one important fact to remember, even if your memory is not up to recalling wingspans and flowering months. Alongside the text are charming illustrations labelled with both the binomial and conversational name of the subject. While some might argue that the black-and-white drawings are less helpful for the amateur, the absence of colour illustrations is less important than one might expect because the rest of the detail is written with a view to being remembered easily.

To my mind, however, the best section – especially for parents with inquisitive children – is called ‘a compilation of collective nouns’. Who knew that it was possible to encounter a ‘boogle’ of weasels or a ‘smack’ of jellyfish?



The Armchair Naturalist

Johnson P. Johnson
(Icon Books, £9.99)



Adventures of Riley by Amanda Lumry & Laura Hurwitz; illustrations by Sarah McIntyre (Eaglemont Press, \$15.95)

Riley is an all-American cartoon hero, with the power to change the world. Honestly. His Uncle Max, a famous biologist, is forever inviting him to join his cousin Alice on research missions. So start the many Adventures of... there’s *Survival of the Salmon*

(pictured), *Operation Orangutan* and *Amazon River Rescue*, to name but three. The stories are mild boy’s/girl’s own stuff, with cartoon characterisations pasted into stunning nature photographs. Garlanded with awards, they offer a basic introduction to the principles of ecology. Consequently, they don’t shy away from the reality of predator and prey, nor the man-made threats to the globe, e.g. deforestation and over-fishing. Each book is peppered with fact boxes to help parents answer those inevitable ‘why?’ queries. The stories also help small children (mine are four and six) to come to terms with the dawning realisation that they are not the centre of the world, and about empathy. They have become interminable must reads at home, and for a whole generation of American children – which in itself is cause for celebration.

Visit the associated website www.adventuresofriley.com **Jon Hughes**

Last words? Zaragari

Status: Highly endangered, spoken by less than 1000 people.

Habitat: In and around the village of Zargar, in the Abyek district of Qazvin Province, northwest Iran.

Description: Zargari (known as Romano to its speakers) is the only Indo-Aryan language spoken in Iran, and is descended from Balkan Romani dialects. The ultimately Indo-European heritage that it shares with most modern European languages (including English, of course) is clear in the numbers – for example, ‘oxto’ means ‘eight’ – and some basic vocabulary: such as ‘dand’, meaning ‘tooth’ (think dentist) or ‘dar’, meaning ‘door’. This linguistic provenance attests to the fact that Roma people re-emigrated to Iran out of Europe after their initial journey across the Iranian plateau from northern India some 1,000 years ago. The word ‘Gypsy’, which is commonly applied to Roma peoples, is actually a misnomer resulting from the old belief that they were of Egyptian ancestry.

‘Zar’ is Persian for ‘gold’ and ‘-gar’ is a suffix denoting ‘a doer’, so the Zargari were traditionally goldsmiths. Nowadays they are farmers, subsisting on grain and cattle. The grammar of Zargari would be fairly familiar to anyone who has learnt a Romance language, such as French or Spanish, but there is an obvious difference in that it has no definite articles. Like all Romani languages, Zargari has many loan words, in this case taken from its nearest neighbours, but also Greek.

The Zargari are trilingual, also speaking Persian and Azari Turkish. These pressures for communication and the frequency of marrying out of the community mean that the Zargari language is being lost on its way to the younger generations. Perhaps a people that wandered for so long can only lose themselves when they finally give in to the paradox of progress and stay still.

David Hawkins

How to be free

The graveyard shift

Working life in contemporary Britain should come with a health warning, argues **Tom Hodgkinson**, or we'll all end up dying for a job

Back in 1993, when I started publishing *The Idler* magazine, it was seen in the wider world as something of a gag, a laugh. I remember that *The Daily Telegraph* wrote at the time that I would need 'imagination to keep the joke going'. The idea of idleness as something good was seen as a bit of a giggle: here was someone who thought we should laze around under the trees all day instead of working. Ha, ha, ha.

Well, then as now, the project is in actual fact deadly serious. We need urgently to find alternatives to our current system of work for the simple reason that it is, literally, killing us and driving us crazy.

This truth came home to me when speaking at the fourth Lincoln Men's Conference in late September. Much of the audience was comprised of people who had suffered from mental health problems. Many were bipolar; others had experienced severe nervous breakdowns.

What fascinated me was that, almost without exception, the breakdowns had been caused by extreme stress in the workplace. In some cases the system had then sent these people into the psychiatric ward, where they were tortured with various toxic drugs with sinister Space-Age names such as Ativan, haloperidol, zopiclone, Prozac, amitriptylene and lithium. When one drug didn't work, the doctors would try a different one on these poor guinea pigs. One drug would zombify, another would elate to an absurd degree, another cause you to gain masses of weight in a short space of time. Sometimes, when their condition was deemed to have stabilised, they were sent back to the very employers that had caused the breakdown in the first place. An even worse breakdown might then follow. It seemed the psychiatrists were concerned principally with 'getting the patient back to work', i.e. returning them as quickly as possible to their role as automatons

in the slave-pits of the economy rather than looking at the well-being of the patient.

But what many eventually realised is that it was our crazy system of work that was at fault and not the person. I would argue, indeed, that far from being mad their reaction was the only sane one: a total physical breakdown as a protest against an inhumane situation. As a result of their experiences, all had more or less embraced the idler's life, had found a new freedom; now they were pursuing a number of different activities, from social work to writing to carpentry to conservation work. They were

creating for themselves a life outside of work as conventionally understood. It is a shame they had come to the idle life as a result of being nearly destroyed by the 'Combine', as Ken Kesey calls the system in *One Flew Over The Cuckoo's Nest*, but better late than never.

Wonderful to relate as well, that many of the audience told me they'd found my books and *The Idler* to be useful therapeutically, first for telling them that they are the sane ones, but also for encouraging the idea that a degree of melancholy can actually be enjoyed and can be creatively stimulating; after all, would Keats have written *An Ode On Melancholy* in 1819 if he'd been on Ativan?

So let the scoffing stop. We idlers are the inheritors of the planet and we will not cease from mental fight till we have built a heaven on this earth.

And all this is why I urge you to join my new campaign for a work-free Britain. We need to stop this dangerous drug quickly. To begin with, offices will have special working areas where addicts can go with their laptops, but eventually we would hope to make all offices completely work-free. A work-free Britain would enormously reduce the cost to the NHS of looking after those who suffer from work-related diseases and conditions, so we are going to produce health warnings that will have to be displayed on every computer screen and Blackberry – by law. Here is a selection: Working Seriously Damages Your Health. Working While Pregnant Can Harm Your Baby. Working Seriously Harms You And Others Around You. Stopping Working Reduces the Risk of Fatal Heart and Lung Diseases. Working is Highly Addictive: Studies Show That Working Can Be Harder to Quit than Cocaine or Heroin, and of course, the simple but effective Working Kills. **E**

Tom Hodgkinson is the Editor of *The Idler* and author of the book *How to be Free* (Hamish Hamilton, £14.99).



'We need urgently to find alternatives to our current system of work for the simple reason that it is literally killing us'



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